PROFESSIONAL™

HANDBOOK

INTEGRATED SPREADSHEET

VIP Professional™ Handbook

Integrated Spreadsheet Program
For the Atari ST

VIP Technologies Corporation

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How to Use This Handbook

In writing the *VIP Professional Handbook*, we make the assumption that you are familiar with the Atari ST computer, the GEM desktop and how to use the mouse. If this is not the case, we suggest you read through the Atari user's manual before you start using the program.

VIP Professional Handbook is divided into two sections: the Tutorial and the Reference Guide. The Tutorial is designed to get you started with the program, while the Reference Guide gives more detailed information about the available commands and functions.

The Tutorial introduces you to the basic concepts of VIP. First, the basic workings of VIP Professional are described. Then, the Tutorial goes on to provide information on some frequently used commands and functions by using a sample worksheet budget to lead you through various procedures and examples.

The Reference Guide presents detailed information on the commands and functions available with the Professional. The first chapter reviews the worksheet basics. This is followed by two chapters introducing keyboard macros and giving an in-depth discussion of formulas.

The following chapters of the Reference Guide are devoted to the menu commands. Each of the commands is discussed in depth, and examples are provided.

For additional information, the *Handbook* contains four appendices, a glossary and index. The appendices cover the GraphPrint program, using Lotus 1-2-3™ files, and provides a list of reference works which deal specifically with using Lotus 1-2-3. The index should be of particular help if you need specific information about any topic.

The illustrations used in the *Handbook* are primarily taken from the text version of the program. Those illustrations which are taken from the GEM version are found mainly in the first chapters of the *Handbook*, where the difference in options of the two versions are most apparent. Illustrations using the text version are given because it is easier to relate these to the manuals and other works written for 1-2-3. However, you will notice that, with the exception of mouse movement and some differences in screen appearance, the two versions are exactly the same. Throughout this handbook, we will refer to both mouse and key ways of doing things when there are any differences.

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Tutorial

Tutorial Introduction

Introducing Integrated Spreadsheets

Electronic spreadsheets are one of the most popular programs for personal computers. Hardly a person exists who does not have the need to make calculations, be they for taxes, a home budget, checkbook ledger, financial plans, mathematics problems, or any one of hundreds of other uses. Before computers became easily available, we had to depend on pencils and erasers to draw up our budgets. If we wanted to change some assumption, such as our monthly heating costs or medical expenses, we would have to erase all the figures dependent on those figures and recalculate them. Drawing up budgets or other financial plans was a burden, being both time consuming and messy.

Then, electronic spreadsheets were introduced. The public was presented with a better alternative to creating spreadsheets than the paper-and-pencil method. Electronic spreadsheets were designed to eliminate the hassle associated with financial planning by harnessing the power of a computer to do the work needed.

The Lotus 1-2-3 Standard

After several years of the development of spreadsheets, there has emerged a universal standard: Lotus 1-2-3. Lotus 1-2-3 has set the standard for many of the business and productivity worlds. Almost all spreadsheets conform to the 1-2-3 file structure, and millions of people are trained in its commands and structure. Not only that, unlike any other computer program, 1-2-3 has spawned a literal mini-industry, with special application programs, books, spreadsheet templates, and even a magazine devoted just to 1-2-3. Because of this obvious standard, VIP Professional has been directly modeled after 1-2-3 to bring that standard and its many benefits to you.

What makes 1-2-3 so popular is its extreme power and its integration of the major pieces required for financial planning: a spreadsheet, a database, and presentation graphics. These powerful applications have been integrated into one easy-to-use package.

VIP Professional Takes 1-2-3 Up To 10

VIP Professional completely adheres to the 1-2-3 standard. You, the user, can use Professional just as you would use 1-2-3 — the sames keystrokes, commands and results. Because of this, you can go to the same books, magazines, templates and applications written for 1-2-3, and apply them immediately to your use of VIP Professional. We have provided a list of books and the like in Appendix B just for that purpose.

But we haven't stopped at mere compliance with the Lotus standard. Lotus was created before the exciting advances in graphics displays and mice. Lotus is also limited to the constraints imposed by the IBM PC. VIP Professional is therefore able to give you the benefits of drop-down menus, dialogue boxes and the like made available by the new breed of mouse-driven computers. This means that the 1-2-3 standard is made even easier to use.

In addition, VIP Professional has incorporated many of the advances allowed by the newer, more powerful computers, including a gigantic 8192-row by 256-column spreadsheet, versus the 2047-row spreadsheet of Lotus. Many other enhancements to the Lotus standard have also been included to make VIP Professional lead the way to the powerful spreadsheets of the future. Perhaps what's best of all, VIP Professional is being made available on nearly every popular computer so that the 1-2-3 standard will be available to everyone, and everyone will be able to transfer spreadsheet files, no matter what computer they use.

Conventions Used in the Handbook

Several conventions are used in this *Handbook* for keyboard notation. When referred to, separate key names are enclosed in square brackets. For instance, the arrow keys are referred to by the direction that each points: [Right], [Left], [Up] and [Down]. Other keys and key combinations are referred to by their generic names. For example, moving the screen display one screenful over is known as paging and will be referred to as [Page][Left] (or [Right], [Up] or [Down], depending on the direction of the page).

There are ten special function key combinations which are referred to by name and/or by the word "Function" and a number which designates its place (1 through 10). For example, the GoTo function may also be referred to as Function 5.

Unless it is specifically stated otherwise, if we place two keystrokes in a procedure together, press the first and, while you are pressing the first, press the second. For example, to make a capital letter "A", you would press [Shift][A]. If we separate keystrokes from one another (perhaps by using "and" or "or"), press the first key, then press the second.

If you are not sure of the key strokes needed to execute various functions, you may also refresh your memory by using the Quick Reference Card which comes with this program.

In addition to using certain conventions with keyboard commands, we use some for menu commands. In later chapters of both the Tutorial and the Reference Guide, we will ask you to select a certain command and we will follow this request with a set of characters enclosed in parentheses. For instance, we might ask you to select the Query command from the Data menu (/DQ). For the same command, we might ask you to select the Data Query command (/DQ). Each word of a command represents a level in the command sequence. To get to the Query command, you have to go through the Data command.

Lesson One:

Getting To Know VIP Professional

Introduction

The VIP Professional Tutorial has been designed to get you going with your new program right away. Our intention is to teach you how to operate VIP Professional. At the same time, we try to tie in your newly found knowledge about Professional with that of spreadsheets in general.

This chapter introduces you to the basic structure of VIP Professional. It explains what VIP Professional looks like and how to move about the worksheet.

The rest of the Tutorial will take you through the steps for creating a simple home budget. Home budgets are something we're all familiar with, so we don't have to concentrate on what they are and how they work. Instead, we can pay attention to using VIP Professional.

Creating the home budget will teach you how to use the essential commands of Professional and a great many of its features. Each lesson is designed to help you through a few of the basic commands as you add more and more to your new budget. At the same time, we will be mentioning some of the options available in each of the areas.

Feel free to handle just one lesson, or even just a part of a lesson at a time. The whole idea is to make learning this program as easy as possible for you. Once you have finished the lessons of the Tutorial, you will be ready to make your own spreadsheets.

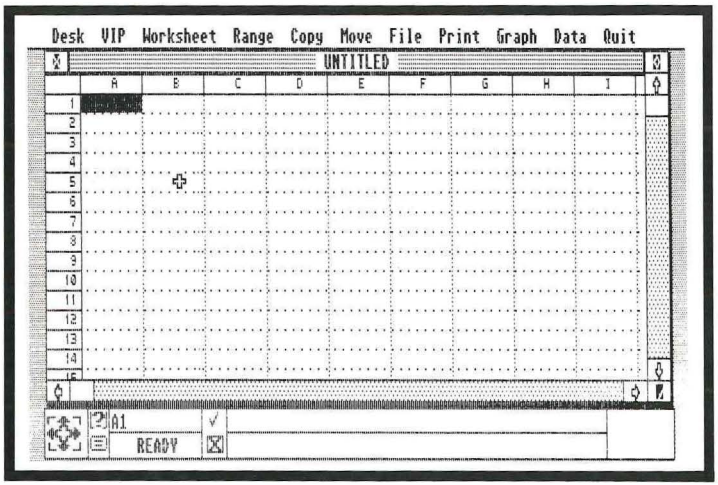
The Atari ST Keyboard

The Atari ST keyboard is one of the best designed keyboards for any microcomputer. It provides keys for almost all popular functions. This is a great help for programs such as VIP Professional because it assures ease-of-use. You will find the function keys, the arrow keypad and the numeric keypad of great use with this program.

Because of the well-designed keyboard, we have often been able to create more than one way to perform a task. This allows those who have previously worked with Lotus 1-2-3 to use familiar keystrokes. It also allows the newcomer to learn VIP Professional while taking full advantage of the ST keyboard.

VIP Professional's Display

After you've loaded the VIP Professional program, you will see this display on your screen:



The Face of the VIP Professional

This screen display can be divided into three basic areas: the menu line at the top; the worksheet area in the middle; and the control panel at the bottom. The menu line at the top contains the menu titles for the many menu commands available with VIP Professional. We will discuss these menu choices later in this chapter. First, let's get a better understanding of the display.

The Worksheet Area

Below the menu line is the worksheet display and its borders. Heading the worksheet is a rectangular bar with horizontal lines called a Title bar. In the midst of it is the word, "Untitled". Once you name your worksheet as a file, its name will appear instead of "Untitled".

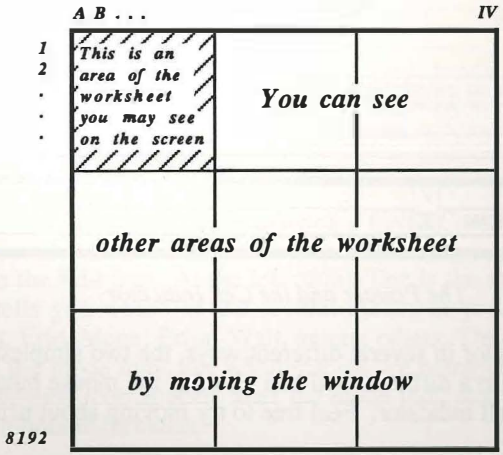
At the left of the Title bar is the "Quit box". If you click the mouse key after you have moved the cell pointer over the Quit box, you will leave, or quit, your worksheet. You are prompted as to whether or not you want to save your work.

At the right of the Title bar is the "Full box" which you are familiar with from GEM. It works the same with VIP Professional, except that the worksheet will not cover the control panel at the bottom of the screen.

The worksheet display takes up much of the screen area. It consists of a gridlike pattern of horizontal and vertical dotted lines. This display of grid lines can be turned on or off from the VIP menu. The rectangular areas formed by the grid lines are the cells. In many ways, this area is like a sheet of paper you would use to do calculating work. In each cell, you may enter a piece of data and that cell acts as a container for the data.

At the left and to the top of the worksheet are the borders which label rows and columns. The rows are labeled by numbers; the columns are labeled with letters. There are up to 8192 rows and up to 256 columns possible in one worksheet. After the columns reach Z, the series goes to AA, AB and so on to IV.

As you can tell from the description above, what you see on the screen can only be a partial display of your entire worksheet. A worksheet can go off the screen many times over to the right and at the bottom. In fact, the screen display is like a gliding window which shows just a small portion of your worksheet. You can move your "window" anywhere on the worksheet as you are working, but you cannot see anything larger than what fits in your screen. Using a standard font and column width, this is usually about seven columns by fifteen rows.



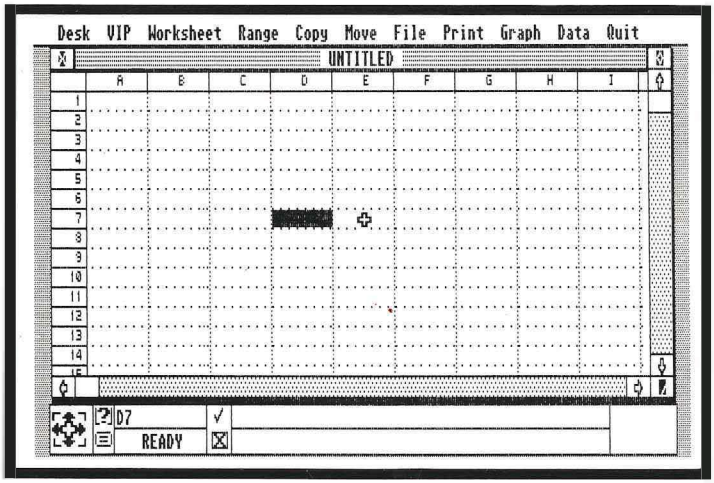
Moving the Window Over the Worksheet

Until you print your worksheet, you will not be able to see the entire worksheet at one time. The screen display can, however, be split so that you see two sections of your worksheet from different areas (see "Lesson Six: Windows and Titles").

By now you will have noticed the pointer which moves when you move the mouse. This pointer has different functions depending on where it is on the sheet. While in the worksheet, the pointer has the shape of a cross, and is called the cell pointer because it is

used to select cells. When it leaves the worksheet, it becomes an arrow for selecting menus and other items. The pointer becomes a grooved box when it is close to the left and top edge of the worksheet and when it is near the column dividers. This indicates that it can be dragged to create windows or wider columns. Of course, the pointer will turn into the "busy bee" when the system is busy.

As we've mentioned, the cells in the worksheet are usually divided by lines for neat formatting. Notice that one cell is shown as a dark block. In this cell rests the cell indicator. The cell indicator indicates the cell which will be affected by data entry or which is the starting point for any command. Whenever you want to write something in a cell, you must first move the cell indicator to that cell.



The Pointer and the Cell Indicator

You can move the indicator in several different ways, the two simplest being by pointing (moving the cell pointer) to a different cell and clicking the mouse button, or by using the arrow keys to move the cell indicator. Feel free to try moving about using either way.

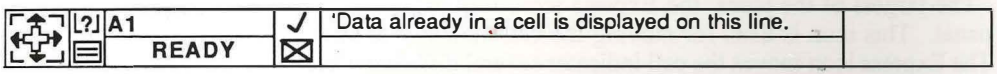
Acting as borders at the bottom and to the right side of the worksheet are the Scroll boxes. These areas are for controlling movement of the screen display. For those of you who are using a mouse, they offer a convenient and easy way to move your screen display. The figures in the Scroll boxes are for scrolling, paging and gliding. Their uses are discussed later in this chapter.

At the lower right side of the worksheet display, in the corner where the lower and right Scroll boxes (described below) meet, there is the Size box. It works just like it does in GEM.

The Control Panel

The area at the bottom of the screen, below the worksheet display, is the control panel. It controls data entry, editing, worksheet movements and messages. At the extreme left of the control panel is the Express icon, which controls nine movement commands. Next to the Express icon are icons for two commonly used functions: Help and Recalculate. On the far right of the control panel is an area for displaying status icons. The middle portion of the control panel contains the Status line at the top, and the Edit line at the bottom.

The Status line is so called because it displays the contents and the status of the cell in which the cell indicator resides. The first part of the line is the cell locator. The cell locator gives the current location of the cell indicator, or where you are in the worksheet, by displaying its address (the column letter and row number of the cell). Next to the cell locator is a "check" icon. This is the mouse equivalent of the [Return] key. Beyond the ckeckmark is space for displaying cell contents. Whenever the cell indicator rests in a cell in which a format command has been invoked or data entered, the data and command status will be shown in the space next to the cell locator. The data is shown in full. The format commands are shown in abbreviated form with parentheses around them.



The Status Line Displaying a Cell's Contents

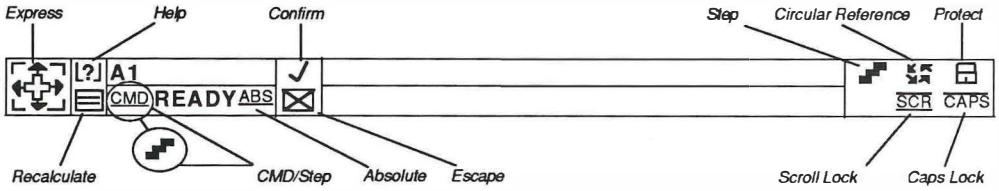
The second line is the Edit line. At the left of this line is the mode indicator. The mode indicator usually tells you which of the several modes or processes the program is in: Value, Label, Point, Edit, Menu, Error, Wait, among others. The Command and Step icons may appear before the mode indicator when macros are being used. When you are in the Point mode, the Absolute icon appears after the mode indicator so that you can click it to create absolute references in formulas.

The mode indicator also serves as the mouse equivalent of the [Break] function. Whenever you click on it, you are returned to the Ready mode. Next to the mode indicator is an Escape (or Cancel) icon. This icon is the mouse version of the [Escape] key. The Break and Escape functions are discussed later in this chapter.

The rest of the Edit line is used when you enter the Edit mode. A duplicate version of the entry on the Status line appears on the Edit line for you to work with. The Edit line is also used to display help messages and prompts which assist in implementing commands.

VIP's Icons

By now you should be wondering what the Express icon and the other icons are for, and how they are used. Icons have two purposes: to inform, or to be a "button". Many icons appear in the right-hand area of the control panel only when you have entered a certain mode or to remind you of an active status. For example, if you have depressed the [CapsLock] key, a CapsLock icon appears to remind you. Other icons provide a convenient way to implement a command. For instance, the Recalculate icon provides an easy way for you to recalculate the sheet. To recalculate, you need only click on the Recalculate icon. The icons which appear in the control panel are displayed below:



Icons in the Control Panel

The largest of the icons, the Express icon, is constantly visible at the left of the control panel. This icon is used for moving the cell indicator to different areas of the worksheet. The Express icon moves the cell indicator several different ways, depending on which part of it the pointer is over when you click the mouse. How to use the Express icon is described in the section, "Using a Mouse to Move Around" of this chapter.

The other icons consist of a Help icon, an OK or checkmark icon, an Escape icon, an Absolute icon, a Recalculate icon, a Circular Reference icon, a Protect icon, a Scroll Lock icon, an End icon, a Step icon, and a CapsLock icon. Aside from the Help, Recalculate and Escape icons, these icons only appear when invoked, and they disappear when they no longer apply. Each of these icons is discussed briefly below. Further discussion of the individual functions can be found throughout the rest of the manual, in the sections which apply to them.

We have already discussed the Escape and checkmark icons. Another permanent icon is the Help icon. The Help icon is used to obtain context-sensitive help. At any time while using the program, you may click on the Help icon to get instant help about the command or function you are using. This has the same effect as hitting the [Help] key or [Function 1].

The Recalculate icon is another permanent icon. When you click on it, a recalculation will occur. This has the same effect as pressing [Function 9].

The Absolute icon appears to the right of the mode indicator only when you are in the Point mode and are pointing to a cell you wish to reference. If you move the cell pointer over the Absolute icon and click the mouse key, the reference will run through a cycle from totally absolute to totally relative. This has the same effect as pressing [Function 4].

The End icon appears when you have pressed the [Insert] key to indicate that the next time you press an arrow key, you will tab in the direction indicated. It is called End because that is what it is called in Lotus 1-2-3.

The Circular Reference icon appears during a calculation of your worksheet if a circular reference is found. Circular references may cause problems in worksheet calculations because they consist of two cells with formulas which depend on one another and, therefore, cannot be resolved without changing one reference.

The Protect icon appears to indicate that global protection has been enabled.

In addition to the icons described above, several icons indicate statuses. When the Scroll Lock facility is on, the Scroll Lock icon appears. The Step icon appears when you have invoked single stepping in macro execution. The CapsLock icon appears when the [CapsLock] key has been used.

Moving Around the Worksheet

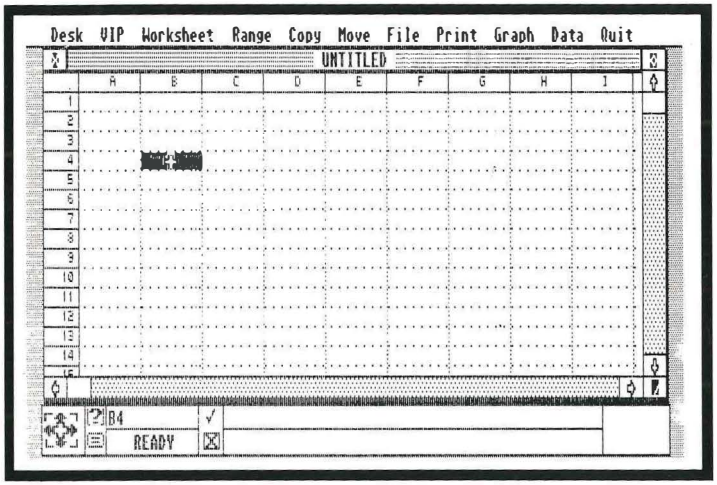
Now that you know what all the elements of the worksheet are, it's time to learn more about how to use the worksheet. The first thing to learn is how to get around so that you can enter data.

Convenient methods for getting around a spreadsheet are essential since much of your work will involve moving around to enter data, altering ranges and comparing different parts of your spreadsheet. VIP Professional has a wealth of ways to get you where you want to go, and to get you there quickly. Many of you will prefer to use the mouse to move around; still, there will be times when using the keyboard will be the most convenient method. Because of this, we have built in similar movement functions for both methods to make sure you can get around just as easily either from the keyboard or with the mouse.

Using a Mouse to Move Around

When you move the mouse, you control the pointer. When the pointer is over the sheet, it has a cross shape. You can move it freely over any cell on the screen. To select any cell, just click the mouse button when the pointer is over the cell. When you have selected a cell, the cell locator on the bottom of the screen is updated to show the new location.

It is important to remember that the cell indicator is "where the action is." All commands and data entry affect only the cell where the cell indicator resides. Yet, the pointer can move anywhere, even to parts of the worksheet currently off the screen. Because of this, you have to remember to click on a cell if you want to select that cell; placing the pointer over the cell is not enough.



Selecting a Cell with the Cell Pointer

Movement around your worksheet with the mouse is very easy. At your disposal are the Scroll bars, Scroll arrows and Express icon.

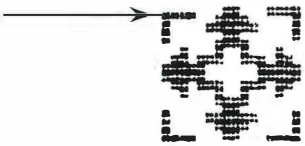
The Scroll bars at the right and bottom of the worksheet allow you to glide to distant parts of the worksheet in a hurry. Their use is very simple. Just move the pointer over the box, or "thumb", in the Scroll bar, hold the mouse key down and drag the thumb across the bar by moving the pointer. You will notice that as you drag the thumb, the cell locator is updated. What is shown is the location of the upper left cell of the worksheet window as you move. When the locator gives the general location you desire, let up on the mouse button. You will then be able to see your updated worksheet area. The cell locator reverts to displaying the actual location of the cell indicator.

Remember that if you want to enter data or execute a command at this new location, you must select a cell. If, instead, you only wanted to go to the new location to check on some data, a simple way to return to the position of the cell indicator is to click on the cell locator in the control panel.

The Scroll arrows in the Scroll bars have two functions. First, clicking on the arrows will move the worksheet in the desired direction one cell at a time. Second, if you press the

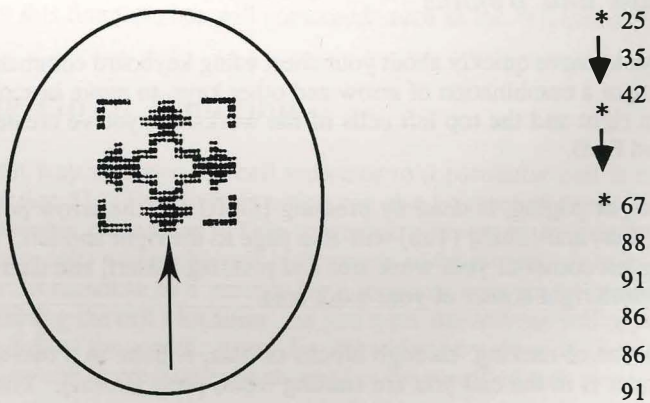
[Shift] key and click the mouse on any of the arrows, your worksheet will move, or page, one windowful in the desired direction.

The Express icon has already been introduced. Movement with the Express icon is tied to data you have entered. The four corners control movement to the four corners of your current worksheet. The four arrows control tabbing to the end or beginning of data blocks (depending on where you are). The center controls movement of the cell indicator within a selected range.



Using the Express Icon to Move the Cell Indicator "Home"

Tabbing is a special feature which you will learn to appreciate. It is useful not only for moving around the worksheet, but also for selecting ranges of data for commands. For those of you familiar with Lotus 1-2-3, this command is equivalent to pressing [End] and then the arrow key for the desired direction. Its use is simple. Any time the cell indicator is on a cell with data and you use a tab, the indicator will move to the last cell containing data in the direction chosen. If the cell indicator is on a blank cell when you tab, it will be moved to the next cell containing data in the desired direction.



Tabbing Down

Using Arrow Keys to Move Around

As was said before, your actual position in the worksheet is reflected by the dark cell indicator. Unlike with the mouse, when you use the keyboard to move around the worksheet, all movement is tied to the cell indicator since the keyboard cannot easily be made to control the pointer. The simplest movement is done by using one of the four arrow keys to move the cell indicator one cell at a time in the desired direction.

When you use arrow keys, you will notice that the longer you press down on them, the farther you will move from your starting position. The reason for this is that arrow keys, like character keys, have a repeat feature. If you depress an arrow key once, the cell indicator only moves one cell. When you press down continuously on the key, it repeats its function over and over until you stop pressing. Professional remembers and stores the keystrokes that haven't been acted on yet. When you stop pressing a key, the program finishes acting on all its keystrokes before it is ready to go to another step. If you want to stop the movement from remembered keystrokes, press [Control] [Undo].

The arrow keys can move you to any cell of the spreadsheet. However, they cannot move the cell indicator beyond the boundaries of the spreadsheet (for example, they can't move the cell indicator to the Status line). If you should attempt to move past its edge, the computer will beep at you and the cell indicator stops moving at the border cell.

However, you can move about inside the spreadsheet while moving the window display with you. This is done by moving the cell indicator to the right or down until you reach the end of the display. If you press the arrow key again, your worksheet will scroll in the direction you have chosen, one row or column at a time.

Moving in Leaps and Bounds

There are also ways to move quickly about your sheet using keyboard commands. You can use your arrow keys, or a combination of arrow and other keys, to move in screenfuls or to move to the bottom right and the top left cells of the worksheet you've created (these are considered Home and End).

Moving by screens, or paging, is done by pressing [Shift] and the arrow pointing in the direction desired. [Tab] and [Shift] [Tab] will also page to the right and left. [Home] will move you to the top left corner of your work area and pressing [Insert] and then [Home] will move you to the bottom right corner of your work area.

Tabbing, the function of moving through blocks of data, is done in a two-step process. After the cell indicator is in the cell you are starting from, press [Insert]. You will notice that the End icon appears in the control panel. Next, press the arrow key pointing in the direction of your choice. This will erase the icon, and move the cursor to the end or

beginning of the block desired. You could also press [Insert], then [Home] to move the cell indicator to the end of your current worksheet.

Once you press [Insert], the End icon remains on the screen until you press an arrow key or until you press [Insert] again to turn it off.

Movement Keys Summary:

Page Right	[Shift] [Right] *or* [Tab]
Page Left	[Shift] [Left] *or* [Shift] [Tab]
Page Up	[Shift] [Up]
Page Down	[Shift] [Down]
Top Left	[Home]
Bottom Right	[Insert] [Home]
Tab	[Insert] *plus arrow key*

Tying the Cell Indicator to Worksheet Movement

VIP Professional provides another feature for moving the screen display over the worksheet using the keyboard. This feature is known as scroll locking. When you press [Shift] [Home], you are linking the movement of the arrow keys to that of the screen. It causes movement of the cell indicator through an arrow key to be synchronized with the worksheet display. The Scroll Lock icon appears in the control panel when you have enabled Scroll Lock. Every time you use an arrow key to move, the screen is also moved the same amount of cells. To unlock scrolling, press [Shift] [Home] again.

The key combinations for moving by pages and the scroll bars won't operate while you are making use of this function, nor will commands such as the Worksheet Titles command.

Using the GoTo Function

A convenient way to move the cell indicator to a particular cell is by using the GoTo function [Function 5]. (The GoTo function can also be reached through the VIP menu, but we will discuss this more later.) This command allows you to specify a cell address (or coordinates of a cell) where the cell indicator is to be moved. It is initiated by pressing [Function 5]. In response to a prompt for a location, type the column letter and the row number designating the cell's location. As you type, the address will appear on the Edit line in the control area of the screen. Enter the cell address by pressing [Return]. Your position in the worksheet will immediately be changed to the specified cell.

Protected Cells

There is one instance when you will find you can't move into certain cells of the worksheet. These cells are protected. The reason for protected cells is that there will be times when you put certain information on your spreadsheet that you don't want changedæ no matter what else is changed. An example of a cell you might want protected is one which contains an important formula.

Cell protection can be enabled and disabled (turned on and off) from two different menus: the Worksheet menu (see "Worksheet Commands" in the Reference Guide) and the Range menu (see "Range Commands" in the Reference Guide). When Worksheet protection is enabled a Protect icon will appear in the control panel. The Worksheet Titles command is another command which creates protected areas. These titles can only be entered by using the GoTo function [Function 5], or by using your mouse.

Introducing Menus

One thing remains to be introduced to you before moving on to the making of a budget. As was mentioned before, the top row of the screen contains command menus. VIP Professional has many commands to help you with the creation of your worksheets. Some commands are done with the mouse, or arrow keys, while others are placed in menus.

Each of the menus has a series of selections to cover a specific aspect of the program. Many of these selections also have their own selections as well. You will learn more about these commands in the upcoming chapters. At this point, we only want to give a general idea of how to use the menus.

With a mouse, menu commands are invoked just as they are with GEM. Point at a selection in a displayed menu and click. Often after you make a selection a new command line will appear with another set of selections. These selections may also have menus. In fact, it is possible to go through menus several layers deep, and so you may want a way to get back to a previous menu, or back to the Ready mode. To go back to the last menu, click on the Escape icon; to return to the Ready mode, click on the mode indicator.

The menu commands may also be invoked from the keyboard; either by typing command letters or by using the arrow keys. Note, however, that the Desk and VIP menus cannot be reached from the keyboard, but only with a mouse. This maintains compatibility with Lotus 1-2-3 macros. Whether you use the command letters or the arrow keys, the first step is to press [/]. This causes the mode to change to Menu and the main menu items to become active. To select the Worksheet Window command by typing letters, you would press [W]. The main menu is replaced on the menu line by the Worksheet menu. To select Window from it, you would press [W] again. The Window menu appears on the menu line and you may select one of its commands.

If, instead, you choose to use the arrow keys, you can move back and forth along the menu line with your [Left] and [Right] keys. As you pass over each item, it is highlighted. To choose one of the items, press [Return] when your choice is highlighted. The main menu will vanish to be replaced by the menu of the item of your choice. You may choose an item from this menu just as you did the first one. In this way, you can move through the menus one by one until you are finished making all your choices.

You will notice that as you course through the menu items, help phrases appear in the control panel. These phrases describe the command to help you make the proper selection.

Escaping & Breaking Out of Commands

There are two commands to help you get out of just about any place in the program. One is Escape and the other is Break. Escape is the less drastic of the two. Escape is invoked either by pressing [Escape] on the keyboard, or by clicking on the Escape icon in the control panel. It is used to escape partially out of commands. It usually takes you to the previous step, whether it is the last menu, the last command prompt or the last mode.

Break is used to take you completely out of a command or prompt series. It is invoked either by pressing [Control] [Undo] or by clicking on the mode indicator. You will find it particularly helpful when you want to break out of several layers of menus at one shot.

Saving or Quiting Your Worksheet

When you finish a work session, you may want to save your worksheet. Instructions on how to save and retrieve a worksheet file can be found in "Lesson Eight: Saving, Retrieving and Printing Your Worksheet". On the other hand, you may decide just to quit VIP without saving your worksheet. You may use the Quit command by typing "/Q" or by using your mouse or arrow keys. You may also click the mouse button over the Quit box.

How to Get Help

VIP Professional comes with a built-in, context-sensitive help facility to help you learn to use the program. It is extremely easy to use. At any time when you are using the program, you can either press [Function 1], use the Help command from the VIP menu or click on the Help icon in the control panel, and the Help Menu or specific help will appear with a discussion of help for the general area you are using.

Lesson Two:

Beginning the Home Budget

The Basics of Entering Data

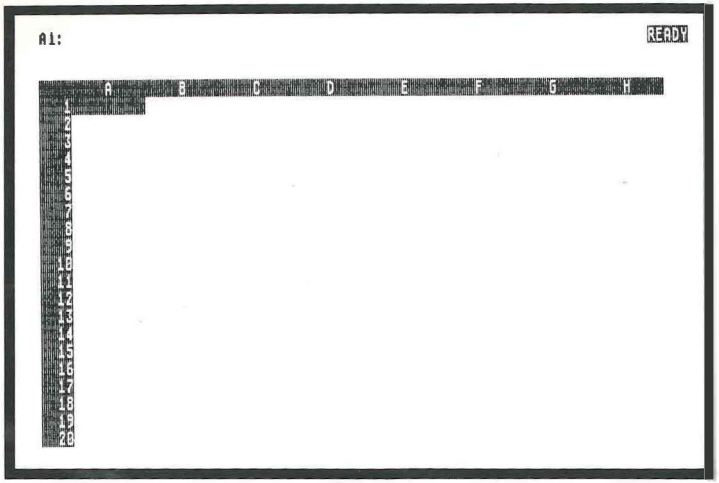
You've loaded the program and familiarized yourself with the display and the basic concepts of Professional. You've formatted blank data disks so that you can save your work in case you want to. You are now ready to start constructing a sample budget on the worksheet, but first, let's go through what we know about cells.

Just What is a Cell?

We've explained that a worksheet is a grid of cells. OK, so exactly what is a cell? Well, a cell is a distinct area for data display. A cell shows some or all of the data assigned to its location, depending on how wide the cell is. Originally, each cell is nine characters wide, so up to nine characters of the data will be displayed in each cell. Methods to enlarge or shrink the cells are discussed later in this section. It must be emphasized that what is displayed does not limit what is stored for that cell.

Although each entry may have up to 240 characters, the display is limited. If the entry is a number, the display will be limited by the current width of the cell. The full cell contents will still be remembered, but only those that will fit in the cell will be displayed. Initially, the program automatically changes numbers to scientific notation if that will allow display of the number in the cell. If the value cannot be displayed in the cell, asterisks will be displayed instead. The asterisks will be replaced by the actual value when the width of the column has been changed to accomodate the display. Changing the column width is discussed in Lesson Four.

Labels are different. Because VIP Professional allows limited text processing capabilities, labels have been given a special feature. A label will spill over the boundaries of its initial cell. This will happen as long as the cells to the right of the initial cell are unused. Because a whole screen of characters can be displayed, you may write complete paragraphs of text very easily.



The Grid

As you can see, the cells are located at coordinates of the grid (for example, A1, C3 or Z200). The worksheet has 256 columns and 8192 rows. This is a sizable chunk of real estate for you to use. The coordinates of a cell are often referred to as the cell's address.

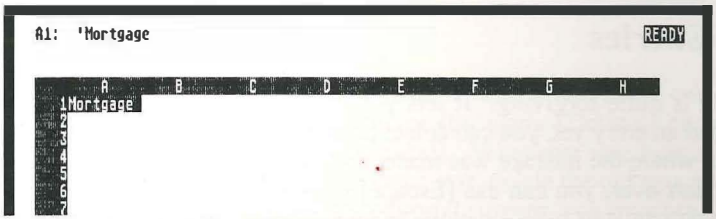
When you create a worksheet, there are three types of information you will be supplying. One category consists of the names and titles you give to columns and rows of figures. This category is called "labels". Another category consists of the numbers you will be working with, such as house payment amounts, etc. These are the "values". The third category is the formulas and calculations you will use to combine the numbers you have supplied, such as adding certain numbers, taking the sum of others, averaging others, and so on. This category is naturally titled "formulas". Formulas are really a subset of values since formulas result in numbers. Each category has its own special input rules so that the program can be sure of dealing correctly with it.

You are helped in data input by the mode indicator in the control panel of the screen. When you are just moving around your worksheet, the mode indicator says "Ready". The Professional is ready for any command or data entry. Once you start to enter data or initiate a command, however, the mode indicator changes. It is ready to tell you the type of data you have entered (by indicating "Value" or "Label" as a mode), or some other special mode, such as "Menu", "Edit", "Point" or "Error", that you are in. This can be helpful when you want to make sure the computer knows what you are doing or vice versa.

Labels

Let's begin to give some shape to your worksheet. With the cell indicator in cell A1, type the following letters: Mortgage. As soon as you type the letter "M", the mode indicator changes from "Ready" to "Label" to indicate what type of data you are putting in the cell. As you type in the text, you will see it on the Edit line. Nothing happens to your worksheet yet. You are still preparing your entry. Until you press [Return], click the mouse on the Checkmark icon or press any arrow key to "set" your entry into your worksheet, you can cancel that entry by pressing [Escape] or by clicking the mouse button while the pointer is over the Escape icon.

Let's press [Return] to set the entry. When you press [Return], the Professional will first check to see if you made any errors. It will quickly recalculate your worksheet and update the screen. The mode indicator is returned to Ready. Presumably no errors have been made at this time, so the word "'Mortgage" on the Edit line is moved to cell A1. It is also moved to the Status line to tell you the contents of the cell where the cell indicator resides.



A Sample Label

But if you typed only the letters "Mortgage", why has an apostrophe been put before the entry on the Status line? This is a special label marker or, as it is more commonly called, a label prefix. Whenever you put a label in a cell, the Professional adds a marker before the label to tell what kind of label it is. When you start on a worksheet, all labels you enter are automatically aligned to the left of cells. You may choose, however, to place labels flush to the right side, center them or have them repeat in the cell. There are four special characters which decide the appearance of a label in a cell. Of these, an apostrophe before the label causes it to begin at the left margin. This is the apostrophe that has been added to the label you entered.

It is automatically assumed that you want your labels aligned to the left. However, if you start an entry with a double quote the label will be justified to the right margin. A caret ("^") would cause it to be centered. A backslash ("\") would cause the label to repeat. For example, using backslash plus the dash character ("\-") would cause the dash to fill the cell. If you want your labels to always be placed at the right or centered, you can use a Worksheet command to change the default (or automatic) setting to do what you want.

Now, let's move the cell indicator to cell B1. You can move the pointer to the cell and click, or press the [Right] key. Here let's use the [Right] key. Did you hold the [Right] key down too long? If so, did you here a slight clinking sound more than once? You were listening to the type-ahead feature. When you input text faster than the screen can react, your keystrokes will be remembered and when you stop pressing, it will continue to perform according to the remembered keystrokes. For example, if you held the [Right] key for a while, you would hear several clinks as the system registered each entry of the [Right] key. After you have let up on the key, the cell indicator continues to move right until all the keyboard instructions have been followed. Any time you want the Professional to stop following the instructions from the keyboard, press [Control][Undo] (the Break function). This will cancel any instructions which haven't been acted on yet.

Where were we? Oh, yes. Get that cell indicator back to cell B1. The entry line should be empty. Type "Car Bills". The Edit line will now show the phrase "'Car Bills". Well, the label "Car Bills" isn't quite right. What we meant was "Car Payments". Since you haven't pressed [Return] yet, we can catch the error.

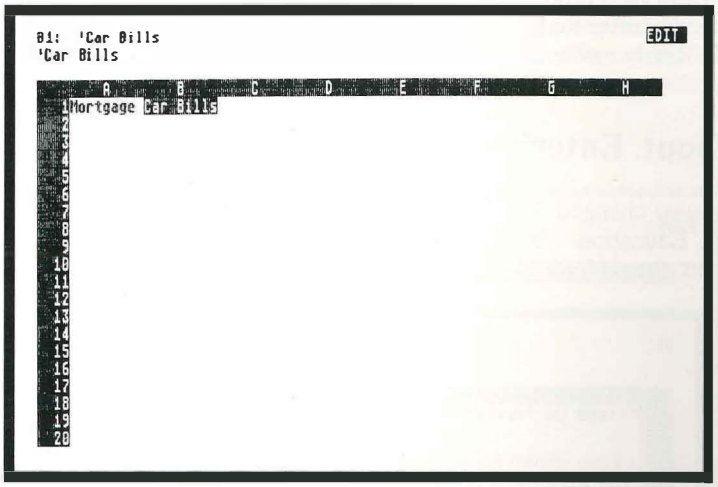
Editing Entries

Professional is quite forgiving. It lets you correct errors in a number of ways. If you haven't finished an entry yet, you can delete preceding characters with [Backspace] until you reach the spot where the mistake was made, and then you can retype the entry correctly. If you want to start over, you can use [Escape] instead. You'll be back in the Ready mode, from where you can start over, or move to another cell. If you move to another cell, you could move back to the first cell, and type in and enter a correct entry. Your new entry would replace your old one. This is VIP's replacement feature.

Still, you may have only made a slight mistake in entering your label or value. Maybe you just spelled the word wrong. Although you could just reenter your data, if you have long labels or complex formulas, it is usually much easier to edit the cell.

To begin editing, first enter the cell to be edited, here B1, and then press [Function 2] (the Edit function). As an option, you can issue the command for Edit by choosing the Edit item from the VIP Menu. The mode indicator will change to "Edit" to tell you that you are in the Edit mode and to remind you that some of the keys now have different functions.

For instance, had we pressed [Return] after entering "Car Bills", we might want to go into the Edit mode to change it. After selecting Edit, the blinking edit cursor appears at the end of the entry. You can move the cursor anywhere on the line to edit. The left and right arrows move you one space at a time toward the left or right. Other key combinations are used to move you to the first ([Home]) and last character ([Insert]) of the entry or five characters to the left or right ([Tab] or [Shift] [Tab]) of its current position.



Editing an Entry

To edit you also have the choice of two delete commands and one insert command. You can delete the character under the blinking cursor (by using [Delete]) or the character preceding the blinking cursor (by using [Backspace]). Whenever you type a character, it will be inserted at the place of the cursor. To change text, delete the old text, then insert the new text. Once you have completed necessary editorial surgery, you may press [Return] to set the entry into your sheet.

Here, we would [Backspace] to the space before "Bills" and type "Payments". Then, we'd press [Return].

Although most of us use the Edit function after we have completed a cell entry, it is also available when first entering data. You may use [Function 2] at any time to enter the Edit mode, and when you have completed your editing of an entry, you may press [Function 2] again to return to completing the entry. Editing is most convenient for fixing complex formulas and long labels.

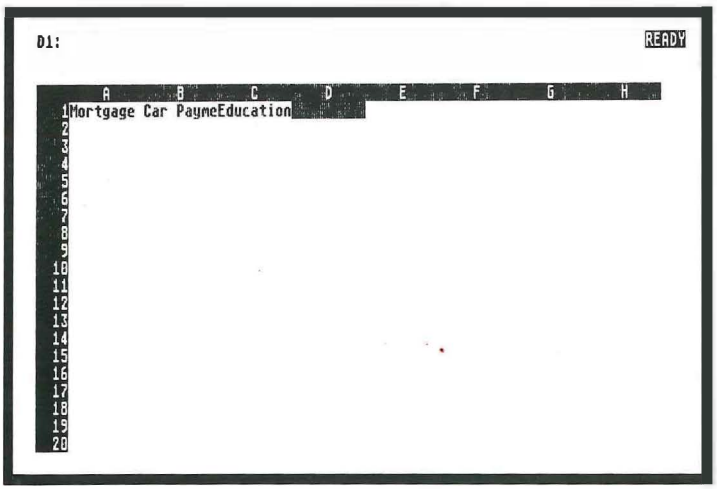
Edit commands are also available when you are entering text in response to a request by VIP Professional for some information. This occurs frequently. For example, it happens in the Range Name command, many of the File commands, and in several of the Graph Option commands.

In addition, if VIP finds an error in an entry, you may be automatically placed in the Edit mode. For example, if you have a label which begins with a number and ends with text (like "3rd Qtr."), VIP will be confused. It will place you in the Edit mode so that you can clear up the source of its confusion. By typing in an individual label prefix at the start of

the label, you can let VIP know that it is definitely a label which you are entering. When you press [Return] after making this minor editing change, VIP will accept your label and go back to the Ready mode.

More About Entering Labels

Now that you've changed "Car Bills" to "Car Payments", move the cell indicator to cell C1 and type: Education. Instead of pressing [Return], press [Right]. What happened? Your worksheet should look like:



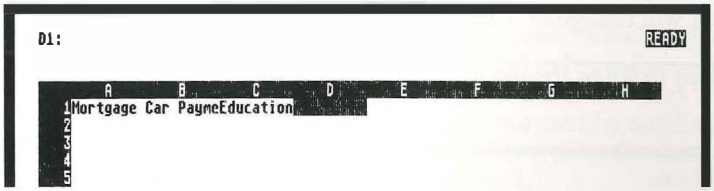
Entering Data Using the Arrow Keys

First note that the cell indicator is not on cell C1, but on cell D1. This is because, to set the entry in the worksheet, you pressed the [Right] key instead of [Return]. When you press an arrow key to set an entry, the entry is set, and the cell indicator automatically moves to the next cell in the direction the arrow key points. You may actually use any of the cell indicator movement commands—including paging, gliding and tabbing—to set an entry and move. In this case, since you used the [Right] key, the cell indicator has moved to cell D1. Selecting D1 with the mouse would have the same effect.

After editing an entry, you can only use [Up], [Down] and the paging commands to set the edited entry because the other keys are used for different purposes in the Edit mode.

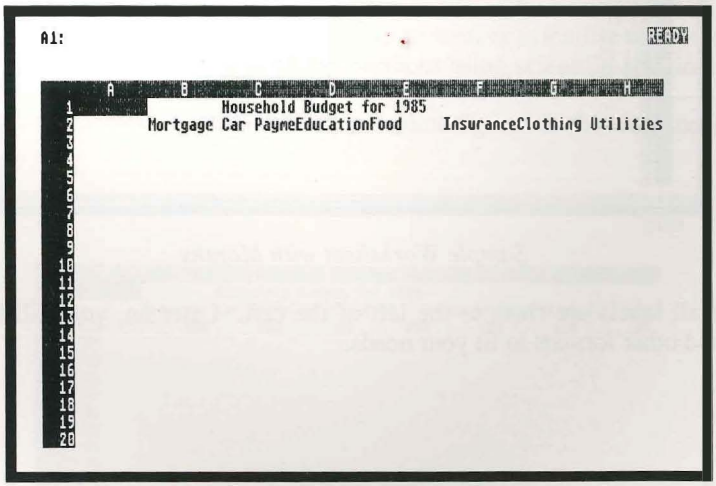
Did you notice that one of the labels you just typed in not only filled cell B1, but extended to the next cell as well? This is because labels have a special feature which allows you to type long labels without being limited by cell width. Because of this, you can use Professional as a text processor to add comments to your reports. The label will be

displayed across cells until the end of the display is reached. The label will skip over cells with existing data, then continue writing in the empty cells beyond the cell with data. Also, if you type new data in a cell which is being overlapped by a long label, your new entry will overwrite the long label in that cell. In succeeding empty cells, the long label continues overlapping.



Overlapping Labels

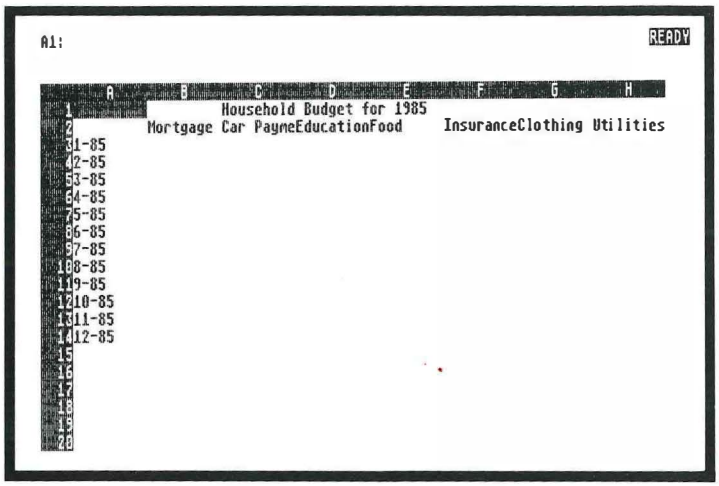
Let's make a sample worksheet. For convenience, we'll begin again. This time, let's start the budget at row two instead of row one. First, clear your worksheet by typing "/WEY". This is just one way of several to use VIP Professional's menus. We will be discussing menu commands in Lesson Four. For now, go ahead and fill in the labels to look like this:



Sample Worksheet Labels

That takes care of the budget labels. But what of the time period for calculating the budget? We'll calculate a budget for a year and put the months down in column A. In cell A3 type: '1-85. You will note that you typed the apostrophe this time before you typed your label. This is because numbers at the start of an entry are usually recognized as values, and so must be purposely marked as labels to be treated as such. If you didn't use the apostrophe, the cell would display a negative 84 (1 minus 85). Any time you wish to enter a number as a label it must be preceded by a label prefix, such as an apostrophe. The mode indicator will change to "Label" to show that you are entering a label.

Now, continue to fill in the next eleven months in column A. Your worksheet will look like this:



Sample Worksheet with Months

Notice that all labels are flush to the left of the cell. Later on, you will learn how to change that and other formats to fit your needs.

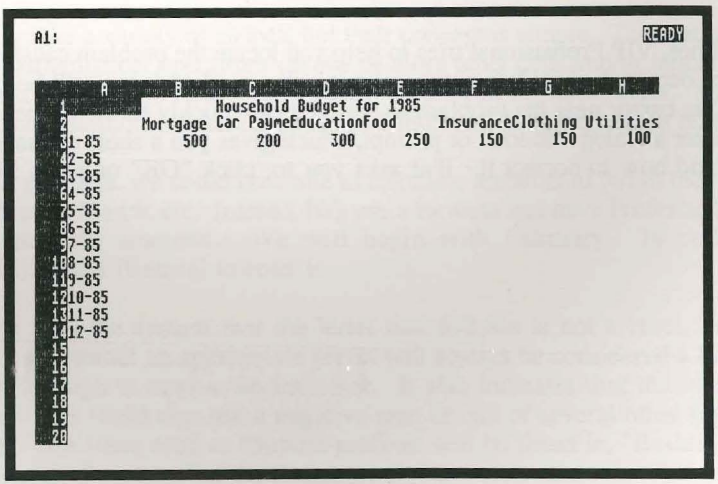
Values

It's now time to put some numbers in the worksheet. As we have seen, numbers can be used as labels. Whenever you enter a number not preceded by a label prefix, the system presumes that you are entering a value. The Ready mode changes to Value, and the Edit line displays the value you are entering.

Of course, aside from the numbers themselves, values and formulas also begin with several other characters. @, #, +, -, ., (, #, and $ can be used to begin formulas. These are described below in the discussion of formulas. The symbols, +, - and ., are also the standard positive and negative signs and the decimal indicator used by numbers. Other than these indicators, values are entered much like labels: by typing the data and pressing [Return]. The same editing functions apply to values as well.

There is one form of number entry, however, that you might not be familiar with: "scientific notation". Scientific notation is a format for displaying extremely large or extremely small numbers, such as 1000000000000000, or .0000000000000001. The idea is to shorten those values by eliminating most of the zeros through use of a power-of-10 factor. This factor is expressed as E (for exponent) plus or minus the number of zeros left out. Thus, the number 1000 could be expressed as 1E+3, and .0001 could be expressed as 1E-4. You are free to enter numbers this way if you like. The number will be displayed in the normal way unless you change the format to general or scientific format, or unless the number is too large or small to fit in the cell without using scientific notation.

Now that you understand value entry, let's put some figures in the worksheet for the first month:



Sample Basic Monthly Costs

As you see, contrary to labels, numbers are automatically flushed to the right with a space left at the end. The space is there to divide the value from any label which might be put in the next cell. Values are aligned to the right because as numbers get bigger, they can extend further to the left in the cell. The digits of all values in a column are lined up. For example, the "ones" are placed closest to the right, the "tens" take the next place and so on. Placement of numbers and other format considerations will be discussed later.

At this point, you have the beginnings of a simple home budget. In the next lesson, we will learn more about making the budget work for us, and how to make it look attractive.

Errors in Data Entry

By now you have probably made a few mistakes and bumped around the spreadsheet, creating strange noises and the like along the way. You may have even been beeped at a few times.

Not to worry — VIP Professional is not about to let you make a mistake that would cause major problems! Generally, everything is planned to make the process of creating a worksheet almost second nature. Still, sometimes a finger can slip and lead to a mistake.

When you have made a mistake, you're likely to hear a beep. If the error is easy to figure out, it is left at that. Usually the beeps are caused by trying to move the cell indicator off the worksheet, etc. However, sometimes you will have to be told what kind of error you made. Sometimes the error was not something you did, but something you did not do. For example, you may have tried to use Help, but been told that you had to put the Help Disk in the drive.

At other times, VIP Professional tries to help you locate the problem causing the error. If the problem occurs during data entry, a beep will sound and you will be put in the Edit mode with the cursor near the problem so that you can quickly fix it. Sometimes, you may even encounter a dialog window, or prompt, which gives you a short message on what you did wrong and how to correct it. If it asks you to, click "OK" or press [Return] before moving on.

Lesson Three:

Formulas and Number Crunching

Introducing Formulas

We now have a simple home budget for the month of January 1985. If we assumed that our expenses would remain the same for each month of the year, the final calculation and all intermediate steps would be simple and hardly worth worrying about. Unfortunately, inflation changes our monthly expense totals. We need to adjust our budget to reflect the expense increases due to inflation. For our example, we will assume a modest inflation rate of 6% per year.

If you were calculating the monthly expense adjustments without the help of VIP Professional, you would first calculate the monthly rate from the yearly rate. Then, you would multiply the previous month's expense by the monthly inflation rate, add it to this month's expense and enter the new number in this month's column. Calculating a budget this way is tedious. The calculation for each expense also has to be done for each month. With five items and 12 months, that's a lot of formulas!

Your spreadsheet has taken the tedium out of such calculations. It does the calculations for you once you've entered the formulas. What's more, you can "copy" the formulas so that you don't have to enter the same formula over and over again. Copying parts of the worksheet will be discussed in Lesson Five.

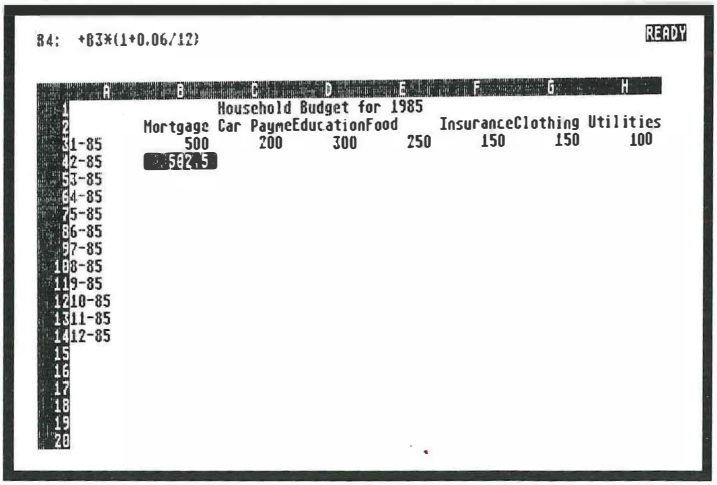
Formulas may take a variety of shapes, but their concept is simple. The aim of a formula is to perform mathematical operations on one or more other cells and/or numerical values, and to be able to display the results numerically in the cell of the formula. Mathematical operations include addition, subtraction, multiplication and division, among others.

In our budget example, we could continue to calculate amounts to put in the rows for the months of February, March, etc. Instead, let's use a formula and have Professional calculate the ensuing monthly amounts. We will begin with February. In cell B4, type: +B3*(1+.06/12). Press [Return] to enter it.

The "+" sign tells the system that the letter that follows is not a label, but part of a formula. A letter without an appropriate prefix will always be considered a label. In this case, the first "+" sign is used as an indicator. It also indicates that the item "B4" is a positive value. You could also use a negative sign or one of several other signs to begin your formulas. The signs used as formula prefixes will be listed in, "Building Formulas Using Operators and Functions" of the Reference Guide.

When you start with a formula indicator, the Ready mode changes to Value. This is because formulas are actually a form of values.

The formula we've just entered in our example tells VIP Professional to multiply the value in cell B3 by 1.005 and place it in cell B4. The figure 1.005 is derived as the factor which reflects an interest rate of 6% over a twelve month period. Once you press [Enter] you will see:



Formula Example

The cell indicator still resides in cell B4. The Status line shows the cell indicator's location by displaying the formula in cell B4. You will note, however, that the contents of B4 are not displayed as a formula, but as a number. In fact, it is the numeric result obtained from the formula.

This is precisely how VIP Professional works. When you enter a formula in a cell, the result of the calculation is displayed. By positioning the cell indicator over the cell, you can see the underlying formula on the Status line.

Pointing to Values in a Formula

There's another way to create the sample formula that is just a little bit easier. After you press [+], use the mouse or the arrow keys to select cell B3. You will notice that the word in the mode indicator changes from "Value" to "Point". The Status line now shows the current location of the cell indicator, B3, and the contents of cell B3. Type the next operator ("*"). Notice that "B3" has been placed on the Edit line after the + sign. The cell

indicator is moved back to cell B4. After moving the cell indicator to cell B3 and pressing [*], you can finish typing the rest of the formula. Enter it by pressing [Return].

Pointing to cells is an easy way to specify cell addresses. You don't have to remember the actual cell coordinates to type in; all you have to do is move the cell indicator over the cell, then type in the next operator or press [Return] if you have reached the end of the formula.

How Formula Construction Affects Calculation

How the formula is calculated has not been explained yet, and it needs to be. There are several calculations in the formula we've just made. The program has to have a way of knowing which calculations should be performed first so that it doesn't reach an unintended result. Obviously, since it cannot read your mind, you have to understand how to establish the order in which it should be calculated (precedence in calculation). In general, the computer calculates from left to right in a formula.

There are two ways to make sure calculations come out right. The first is by using parentheses to enclose calculations which must be performed first. The other is to rely on a standard operational precedence. In our formula example, +B3*(1+.06/12), both methods were used.

Parentheses enclose a subgroup, "(1+.06/12)", in our formula. They separate the operations enclosed by the parentheses from the multiplication operation after "B3". This means that the calculations within the parentheses are completed before being multiplied by the contents of cell B3.

Yet, with "(1+.06/12)" you will see that even within the parentheses are two operations: addition and division. So what is VIP Professional supposed to do first? Add 1 and .06, or divide .06 by 12? The answer lies in the rules of operational precedence. VIP Professional follows the conventions developed in mathematics for the precedence of calculation. One of the most basic rules is that multiplication and division are performed before addition and subtraction. Thus, the program knows to divide .06 by 12 before adding the result to 1. Of course, if you can't remember the rules of precedence, you can use parentheses to make sure the operations are done in the correct order. If you do use parentheses, make sure they are properly paired around the equations you want set off.

There are several other operators besides the four mentioned above, and each has a precedence in calculations. Here's a list of the operators used and their order of precedence. The numbers under the "Precedence" heading tell you which will be done first. Operations which have the same precedence are handled by the system according to their order in the formula, from left to right.

Operator	Function	Precedence
^	Exponentiation	1
-	Make Negative	2
+	Make Positive	2
*	Multiplicaton	3
/	Division	3
+	Addition	4
-	Subtraction	4
=	Equals	5
<>	Not Equal To	5
>	Greater Than	5
>=	Greater or Equal To	5
<	Less Than	5
<=	Less or Equal To	5
#NOT#	Logical Not	6
#AND#	Logical And	7
#OR#	Logical Or	7

Some of the operations need a bit of explanation. Exponentiation (^) is the operation of taking a number to a power. For example, two to the power of two, or two squared, looks like: 2^2. The equal, not equal, and so on through logical Or, are all special logical operators used for sophisticated functions. These are discussed in the chapter devoted to @ functions (see "Building Formulas Using Operators and Functions" of your Reference Guide).

Another matter which needs clarifying is the duplication of the plus and minus signs in the list. As the chart indicates, plus and minus can have two functions. One is as an indicator of positive or negative value; the other is as a mathematical operator. VIP Professional knows the difference between 6-5 and 6--5. The answer to the first is 1, and the second, 11.

Our formula example has taught you how to create formulas using standard operations. There is still more to learn about formulas and advanced functions, but this can wait. The chapter on building formulas in the Reference Guide will provide you with in-depth information about formulas when you are ready.

The Built-in Calculator

VIP Professional has a built-in calculator which you can use to instantly find the result of any formula. It can be used in either of two ways. First, any time that you are entering a formula, you may press [Function 9] or click on the Recalculate icon. The formula will then be changed into its resulting value. The second way to use the calculator is to move to

the cell which contains a formula you wish to evaluate, press [Function 2] to edit the cell, then press [Function 9] or click on the Recalculate icon to evaluate the formula.

Whenever you use the calculator, the program permanently changes the formula into the resulting number. Therefore, if you wish to retain the formula, the best way to use this feature is to first enter the formula in the target cell, then change to the Edit mode and calculate the formula as it appears on the Edit line. Once you have obtained a result, press [Escape] to abort editing and return to the Ready mode while the formula is still in the cell.

Calculation Sequencing

Calculations and recalculations of a worksheet are initially performed automatically and in natural order by VIP Professional whenever you complete an entry. With natural recalculation, VIP Professional calculates each cell by column, but when it encounters a reference to another cell, the contents of that cell are completely calculated before going back to its former order. The process continues until all cell contents have been recalculated. This method takes care of many forward reference problems (which are described later in this section) simply because it takes them into account. Natural recalculation just happens to be one way of calculation order. You can control the order and several other things about how your worksheet is calculated through the Worksheet Global Recalculation menu (menus and their commands will be explained in the next chapter).

Calculation can also be done by first calculating the contents of all cells in column A (in the order of first to last row), then column B and so on across the columns. This is called columnwise recalculation. To have your worksheet calculate in this order, you would choose Columnwise from the Worksheet Global Recalculation menu.

You might want to have calculations performed across rows rather than down columns. This may be because of a special way you have created your formulas. Or, it may be necessary to calculate along rows first to avoid forward or circular references (which are described later in this section). For calculation to be done rowwise, you would choose Rowwise from the Worksheet Global Recalculation menu.

Recalculation after each entry is time consuming, especially as your worksheet becomes larger and there are more formulas to recalculate. You may want to turn off automatic recalculation. A good example of not needing automatic recalculation is when you set up a worksheet from a template. You want quick entry without having to wait for recalculation all the time.

Switching from automatic to manual recalculation is also governed by the Worksheet Global Recalculation menu. To disable automatic calculation, select Manual from the menu. Now, you are free to enter data without waiting for recalculation. Whenever you make a change to the worksheet, the Recalculate icon will appear at the bottom of the screen to remind you that you will have to recalculate when you want to see the correct

results. To recalculate, press [Function 9] (the Calculation function) or click the Recalculate icon while you are in the Ready mode. You may also switch back to automatic recalculation by choosing Automatic from the Worksheet Global Recalculation menu.

Besides using the Recalculate function for recalculating at any time when you're in manual recalculation, there may also be times when you wish to force a recalculation while you are in automatic recalculation. This can happen when a particularly intricate formula will not yield accurate results the first time it is calculated. The problem is frequently caused by an inappropriate sequence of calculation within the formula. To force recalculation again, use [Function 9] while in the Ready mode. You may also force automatic recalculation by specifying a set number of iterations from the Recalculation menu.

Actually, Iteration is another command for recalculating difficult formulas. It sets a number of times for the worksheet to be recalculated. Certain results can only be obtained by several calculations, or iterations, of worksheet formulas. When you choose Iteration from the Worksheet Global Recalculation menu, VIP Professional prompts you to specify the number of iterations you want. In response, you would type a number (between 1 and 50). The next recalculation would be done and repeated the number of times you specified.

Circular References and Forward References

What should have become apparent by now is that it is possible to create a worksheet which will not give accurate results. There can be several reasons for inaccurate calculations in worksheets, the two most common being circular references and forward references. Circular references are formulas which refer to each other. Neither can be properly resolved since they depend on each other for a value. When VIP Professional comes across a circular reference, the Circular Reference icon is displayed in the lower section of the screen. The second potential problem arises from forward references, which are formulas which refer to cells calculated later in the evaluation order. A problem arises since the source cell may be evaluated prior to the cell referred to. If the value of the referenced cell changes between calculations, the source cell will be inaccurately calculated. The Natural recalculation order was created specifically to handle this problem. Still, you may encounter it if you use the Columnwise or Rowwise recalculation methods.

These and other problems which may arise when creating worksheets are discussed thoroughly in works devoted to spreadsheets, along with many hints for successful worksheet creation. See Appendix B.

Lesson Four:

How to Use Some Helpful Commands

Introducing Menu Commands

Up to this point, we have mainly described basics of data entry. Data entry is the primary task in creating a worksheet. Entering data and comparing it with other items of the worksheet is helped by menu commands. These commands let you change the format of the display, let you insert or delete columns, rows and cells, let you juxtapose different parts of the worksheet, let you save, load and print worksheets, graph your results and much, much more!

VIP Professional's command structure is built around a logical separation of functions. With an integrated spreadsheet program, you will wish to perform several different tasks. Many of these tasks have to do with the worksheet as a whole; some only have to do with a certain range of cells; still others have to do with performing an auxiliary function, such as printing, file management, data management or graphing.

VIP Professional has these eleven command menus:

Desk VIP Worksheet Range Copy Move File Data Graph Print Quit

Copy is used to copy the contents of one cell or range to another. Move moves the contents of one cell or range to another. Quit, like the Quit box which can be reached by mouse, allows you to quit the worksheet. Desk and VIP are two special menus which can only be reached by using a mouse.

The Worksheet menu contains commands which affect the worksheet as a whole. Worksheet commands cover such things as cell formatting, creating windows, altering column widths, or setting up printer defaults.

The Range menu gathers together commands that affect a cell or group of cells. These include cell formatting, giving names to ranges for future use, and justifying text in groups of label cells.

The File menu is responsible for every file management command such as saving, retrieving and combining files. In addition, it has a command which helps transfer data from a worksheet file of another program to VIP Professional.

The Graph menu governs creating, decorating and displaying graphs. It also allows you to save either graph settings or the graph itself (in a picture file).

The Data menu provides several unique information management commands to manipulate data in a database. You can put data records in the type of order you specify, single out certain pieces of data or create "what-if" tables using only the necessary information from your worksheet.

"Menu" commands can be implemented with the mouse or from the keyboard. Most commands have subcommands, and many of the subcommands have their own menus. These act just like the main menus except that they must be accessed through the main menus.

Invoking Commands

With the mouse, commands can be chosen by moving the cell pointer across the menu line. As you highlight each item, its drop-down menu will appear in a column below. You may also highlight the items from these menus as you move the pointer over them. You may select an item from the menu line or you may select an item directly from one of the drop-down menus. To select an item, click the mouse while the item is highlighted.

From the keyboard, commands are initiated by pressing [/], then the first letter of the command. That is, 'W' for Worksheet commands, etc. For subcommands, you would press the letter corresponding to the subcommand, such as 'E' for Erase. This is represented in the handbook as /WE. This way of selecting commands excludes Desk and VIP commands.

As with Lotus 1-2-3, you can move through the menus with your arrow keys. First, press [/]. This displays the menu line and allows you to move through and highlight the items (excluding Desk and VIP) by using your [Left] and [Right] keys. Press [Return] when an item is highlighted to select it. Its submenu replaces the existing menu. You may choose an item from this menu the same way you did from the first menu. If there are more submenus, these will be displayed in turn and you may also choose from them. As you move across the menu line, you will notice that when an item is highlighted, its submenu appears in a column beneath it. You may bypass a main item and choose an item directly from its submenu by using your [Up] and [Down] keys to move around in the submenu, highlighting an item and pressing [Return] to enter it.

A common result of invoking a command is a prompt sent by VIP, requesting information. The most common request for information is what range is to be affected by the command. However, you may also be asked to do such things as supplying names or significant digits. The prompt will not only request information, it may give you a message. With the mouse, you will be given the option of clicking the mouse key to complete the action or cancelling the action by moving the pointer on the Cancel icon and clicking the mouse button. From the keyboard, these correspond to [Return] and [Escape].

At times, you may select the wrong command. There are two ways to deal with a wrong menu selection: return to the previous selection and try again (if you are issuing a series of

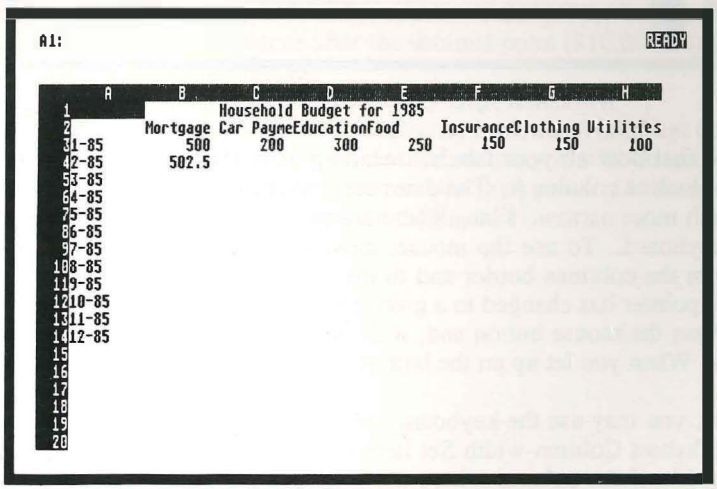
commands) or return all the way to the Ready mode. To return to the last selection, click on the mouse key while the pointer is over the Escape icon or press [Escape]. To escape to the Ready mode, use a break ([Control][Undo]). The mouse equivalent to issuing a break is clicking the mouse button once while the pointer is over the mode indicator.

Go ahead and familiarize yourself with the command structure of VIP Professional. You'll be using the menu commands quite a bit from now on.

Changing the Format of the Worksheet

Let's return to our sample worksheet. Many of the menu commands control how you view the data in your spreadsheet and how to manipulate that data. You not only wish to enter data, you also want it to look a certain way or be standardized for a better display or presentation. You can affect the format of your worksheet in two ways. One is to make the change throughout the entire worksheet; the other is to have the change affect just one cell or range of cells. To affect the entire worksheet, you would use the Worksheet menu; otherwise you would use the Range menu.

Let's look at how these commands affect your worksheet. Your worksheet currently shows columns of nine characters each, with labels aligned to the left and values aligned to the right. These initial settings are the current default format. Defaulted means that the setting is automatically assumed by VIP Professional.

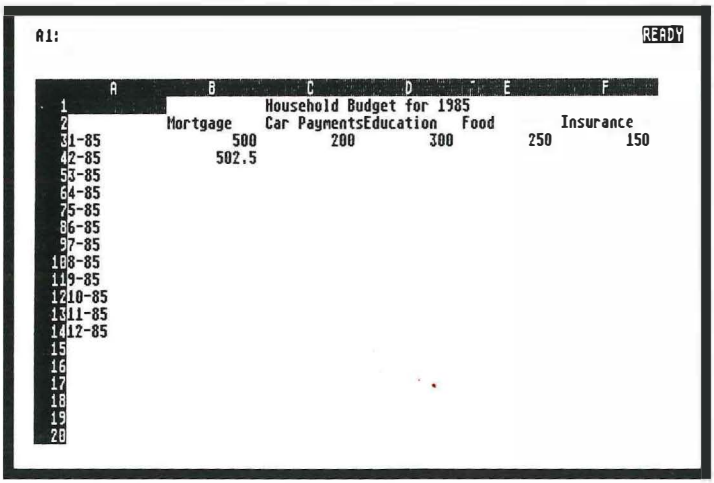


Worksheet Before Changing Format

What if you want all the columns to be 12 instead of 9 characters wide so that you can accomodate wider labels such as "Car Payments"; and what if you wanted the titles in

column A to be centered instead of aligned to the left, and, finally, what if you wanted the numbers to have dollar signs?

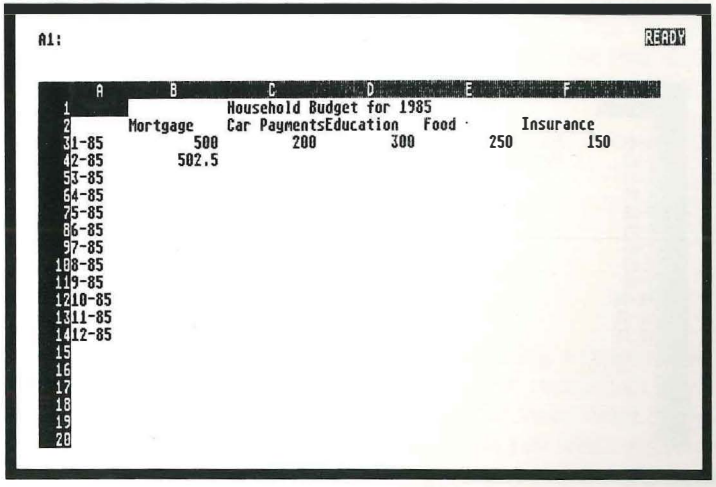
Let's first change the width of all worksheet columns. Select the Worksheet Global Column-width command (/WGC). You will then be prompted for the new width. You may select the width in either one of two ways. You may type in a number for the new width, or use [Left] and [Right] keys to change the width on the screen. Decide for yourself whether to enter the number, 12, or press [Right] three times. Either way, press [Return] to enter your choice.



Worksheet After Global Column-width Change

You will see that now all your labels, including "Car Payments", fit nicely within their columns. But look at column A. The dates seem to rattle around in their cells. Column A should be much more narrow. Fine. There are two ways to change that—with the mouse or with the keyboard. To use the mouse, move the pointer past the line separating the worksheet from the columns border and to the line between columns A and B. You will notice that the pointer has changed to a grooved square. This pointer acts as a "grabber" to grab lines. Press the mouse button and, with the grabber, drag the column line left to the desired width. When you let up on the button, the new width will be set.

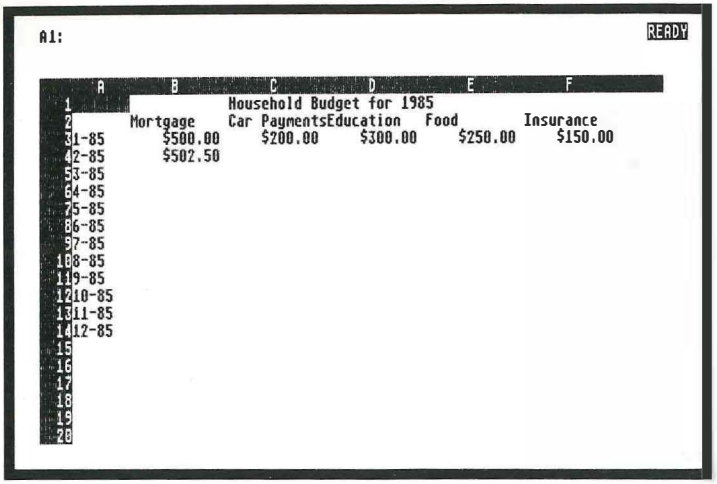
Alternatively, you may use the keyboard. Move the cell indicator into column A. Next, select the Worksheet Column-width Set item (/WCS). Worksheet Column-width Set will change the width of the column where the cell indicator is located. If you had chosen Worksheet Column-width Reset instead, it would simply make sure your column's width was the global one. In response to the prompt you receive after selecting the right command, enter the number, 7, and click the mouse button or press [Return]. Now, the dates look a bit better.



Worksheet After Single Column-width Change

How about another worksheet change? Let's change the display of numbers to a currency format. VIP Professional allows you to format numbers in any one of several different ways. You can fix the number places after the decimal point, you can show numbers as currency, you can show numbers in scientific notation, and so on. The currency format shows numbers with dollar signs, and with commas at the proper breaks, for example, $10,000. It defaults showing two places after the decimal point ($10,000.00) although you may specify more or less than two places.

The display format for the entire worksheet is selected from the Worksheet Global Format menu (/WGF). When you select Currency from the menu, you will be asked to confirm two as the number of digits to be displayed after the decimal point. At this point, click the mouse button or press [Return]. Your values are displayed as:



Changing the Display Format to Currency

Your actions have resulted in changing all the values of your budget to the dollar format. Notice that the numbers in the first column were not changed. This is because those numbers were entered as labels rather than values. . The currency format only applies to values or displayed results of formulas. From now on, whenever you enter a value, the currency format will apply unless you change the worksheet format again or unless you change the format of one particular cell or range of cells using the Range Format command.

Making Localized Changes

Let's illustrate how the local, or Range Format, command is used to change the format of a particular cell. Local Format commands are similar to the Global Format commands. The same formats are offered. The major difference is that, unlike Global commands which apply to an entire worksheet, Range Format commands become "attached" to the cell or group of cells in which they have been used. Even if you change the contents of the cell, the range format remains effective.

The format set by the Range Format command has precedence over the format set with the Worksheet Global command. To change a local format, you must use one of the choices offered by the Range Format command. If you wish to return to the Global format, you would select the Reset option of the Range Format command.

In the same way that changing the format of values in a range has precedence over the format of all worksheet values, a range of labels can be positioned differently in their cells than their global setting allows. As an example, let's change the format of a group of cells

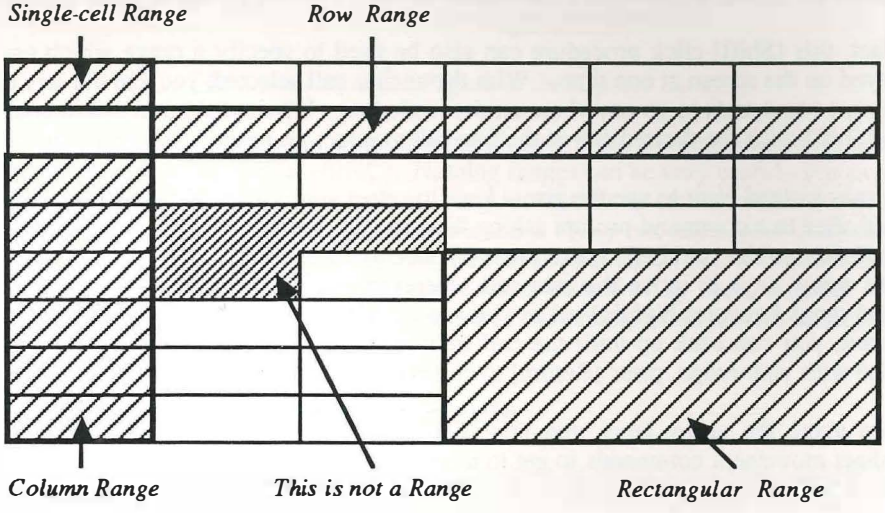
in column A. Let's center the month/year titles. Place the cell indicator over cell A3, the first cell to be changed. Next, select Range Label-prefix (/RL). You are presented with a choice of Left, Right or Center. Select Center (C). You will see that the cell indicator changes slightly. In response to the prompt, specify a range to be covered by the command.

This brings up a interesting feature of VIP Professional: range selection. You won't be doing anything just yet to finish your command selection. Once you've read about range selection, we'll come back to finishing the command.

Selecting a Range

Many of the commands of VIP Professional involve selecting a range of cells which will be the object of a command. The Range, Copy and Move commands obviously require range selections, although ranges must also be selected for many other commands. Some commands, such as the Copy command, even require that you select a source range and a target range.

First, just what is a range? A range is a group of contiguous cells. It can be as small as one cell or as big as the entire worksheet. Of course, it can also be any rectangular area in between. The one thing that a range cannot be is an area of cells which can't be defined by two points. The top left cell (the start or anchor cell) and the bottom right cell (the free or end cell) of the range defines its parameters. These two cells can be one and the same, defining a single cell.



What Constitutes a Range

Range selection is done by using either the keyboard or the mouse. Whenever you need a range, you will be prompted to specify its parameters. At the same time, the cell indicator changes to indicate that it is awaiting a range selection.

If the range consists only of one cell, you can move the cell indicator over that cell and press [Return]. If the range consists of a rectangular area, the easiest way to specify the range is by dragging the pointer with the mouse (that is, holding the mouse button down while you move the pointer).

Actually, using the mouse gives you another option: specifying the range *before* beginning the command. In either case, to specify the range, press the mouse button down while the pointer is over the anchor cell, then drag the pointer to the range's end cell. A dotted-line rectangle will follow the pointer. When you let up on the mouse button, the range of cells covered by the dotted rectangle will be highlighted as the selected range, with the end or "free" cell highlighted differently.

When you are creating your range, why don't you try moving all around the worksheet display while you are holding the mouse button down? Notice how the range parameters change. While you are holding the mouse button down, you can change the borders of your range as much as you want. Only when you let up on the mouse key is the range actually selected and the borders determined.

Until you press [Return] or click on the Checkmark icon in response to the range request, you may freely alter the range. To do so, move the pointer to the cell to be the new free cell, press the [Shift] key and click the mouse button. You can do this as often as you like.

In fact, this [Shift]-click procedure can also be used to specify a range which can't be displayed on the screen at one time. With the anchor cell selected, you can use any of the movement commands to go anywhere on the worksheet. When you get to where you want to go, [Shift]-click the desired cell as the free cell to select the range.

You may instead elect to use the arrow keys to select your range. This method may only be used after to a command prompt asking for a range. To use your arrow keys, place the cell indicator on the start cell. Next, press [.] once to set that cell as the anchor cell. Now, use the arrow keys to move the free cell wherever you wish. You will notice that the selected range becomes highlighted as you move. If you go too far and pass the end cell you want, you can back up until the cell indicator is over the right cell. Once you are satisfied with your range, press [Return] to enter it.

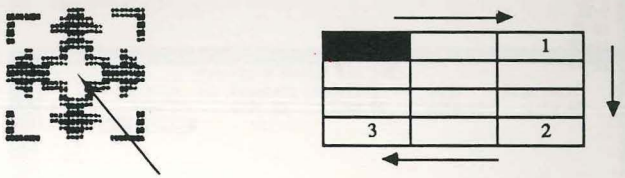
When using the arrow keys, you may also use any of the tabbing, paging or other worksheet movement commands to get to the end of your range. The area covered during the move will be highlighted as part of the range.

Another option for entering the range is to type the cell addresses of the range. Just type the cell address of the start cell, a period and the address of the end cell. It will appear next

to the prompt as you type. You will see two periods separating start and end cells, instead of the one you typed in. This is normal. Press [Return] to enter the range when you are finished specifying.

While you are in the process of specifying your range, you may need to alter it. The [Escape] and [Backspace] keys are used to change the range. [Escape] will back you one step at a time through the process, first to the start cell, then back to the command. [Backspace] will only take you back to the start cell from the end cell. In a command which asks for a source range and a target range, once you have pressed [Return] to set the source range, only [Escape] will return you to the original command; [Backspace] will have no effect.

The range selection feature offers one other convenience. You have noticed that the start cell serves as a pivot for the range. This is why it is also called the anchor cell. When creating a range, you can rotate the anchor cell in a clockwise motion by pressing [.]. The free cell also moves clockwise to keep opposite from the anchor cell. The mouse equivalent of this is the block-shaped cross inside the Express icon. Each time you click your mouse while the pointer is over this cross, you are moved clockwise to the next corner.



The Anchor Rotation Figure in the Express Icon

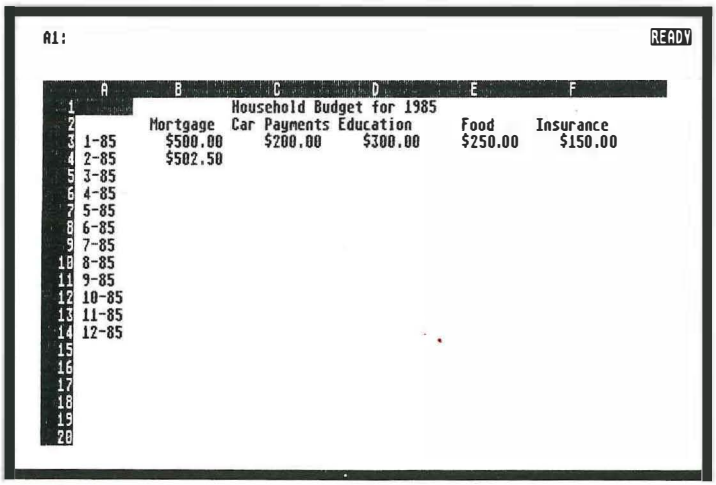
Once you've created a range, you can name it with one of the Range Name commands—to be specific, Range Name Create (/RNC). Naming ranges can be very useful. For example, you might wish to name different parts of your worksheet to create ranges for printing. You can also name ranges to simplify formula entry. Why not name your cells for their functions, such as "Profits", "Costs" and the like. In several cases, you will find it easier to refer to a cell or group of cells by their range name instead of by their location. This is mainly because it is easier to remember the name of something rather than its address.

Back to our Worksheet Example

Going back to our sample worksheet, we only need to specify the range sought by the Range Label-prefix command. Press the mouse button while the pointer is on cell A3, and hold down the button while you drag the pointer to A14. Let up on the mouse button and click on the Checkmark icon. Voila! Each label of the range is centered in its cell.

You can also use the keyboard. With the blinking indicator in A3, press [.] and then press [Down] until you get to A14. Press [Return] to enter it. Or, instead of using the [Down] key to move to the end cell, try using [Insert][Down]. You will see that the cell indicator moved as surely to cell A14 as if you had pressed [Down] to get there. Moving to the end of a column of figures is one of the more frequent uses of the tab feature of VIP Professional.

Now do the same for the expense titles in cells B2 to H2 and your titles will be centered.



Centered Labels Using the Range Label-Prefix Command

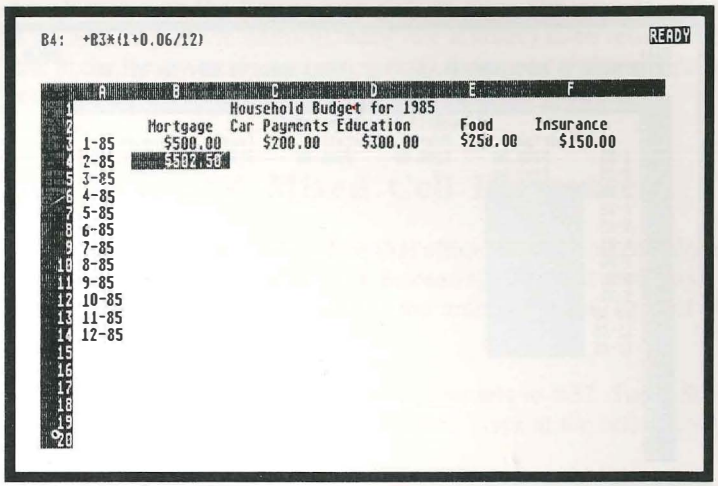
Lesson Five:

Moving Text About

Copying Parts of Your Worksheet

So far, entry of your data has been slow, perhaps even tedious. Each amount has been entered in each cell, and so on and so forth. To continue with the formulas, you could manually type in each formula in each cell, which can get to be quite tedious. Fortunately, the Copy command was designed to alleviate this tedium.

The Copy command allows you to copy labels, values, formats or formulas from one cell or range to another. The power of this command will become obvious very soon. In the examples we have used so far, we entered one formula, the one in cell B3:



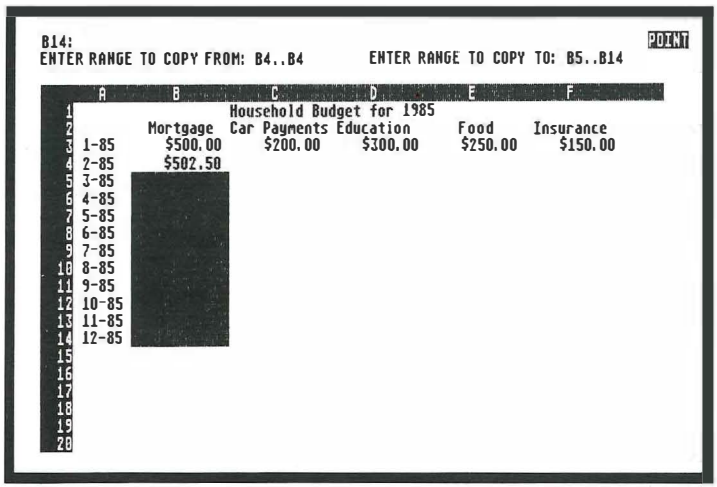
The Range to be Copied

You will recall that this formula calculates the effects of inflation on your monthly costs. Since the inflation rate has been assumed for the entire year, you would have to use the formula for each item and for each month to make the calculations work for the entire year. Furthermore, since the formula has to work in all the cells of column B (cell after cell), you would have to change the cell reference in the formula each time you entered it in another cell. The Copy command can do this—and more—for you.

To best show how Copy works, we will use an example. We want to copy the formula in cell B4 down the entire column to reflect the increases due to inflation on the previous month's expenses. To begin, place the cursor on cell B4 and select Copy (/C). You will now be prompted for the range to be copied, and the target range. Any of the range selection techniques discussed previously can be used to specify ranges.

The area to be copied is often called the "source range" and the area to which it will be copied is the "target range". Prompts will help you specify the ranges in the correct sequence. You are first asked to give the source range. You will notice that the cell indicator has changed to show that it is expecting you to specify a range. This is to tell you that you are in the Point mode. The mode indicator has also changed to "Point". Our source range here is only cell B4, so press [Return] while the cell indicator is over B4.

You are next asked for the target range. Let's try giving the target range with the mouse. Move the pointer to cell B5 and hold down the mouse button. This starts the range at that cell. You will notice that this coordinate, followed by a period, will be put after the "Target Range". VIP Professional is waiting for you to complete the range. Now drag the pointer down to B14, and let up. You will notice that the cell indicator has expanded all the way from B5 to B14:



Selecting the Target Range in Copy

Cell B14 remains highlighted because you have not completed your range selection. You could still change the range by [Shift]-clicking the mouse key while the pointer is over a different cell, such as B13, or C15. For now, click on the Checkmark icon or press [Return] to signal that you are finished with the range.

Using the keyboard can be almost as easy. The first thing to do after giving the source range (by pressing [Return] while the indicator is over cell B4) is to move the indicator to cell B5, using [Down]. Next, press [.] to anchor the cell. VIP Professional now waits for you to specify the end cell of the target range. Use the [Down] key to move the blinking indicator to cell B14. The cell indicator in cell B5 will expand to cover the cells as you move. You could move the indicator in any direction to expand or shrink your range. For our example, after you have moved the indicator to cell B14, press [Return]. The formula in cell B4 is copied in all the cells of column B from B5 to B14.

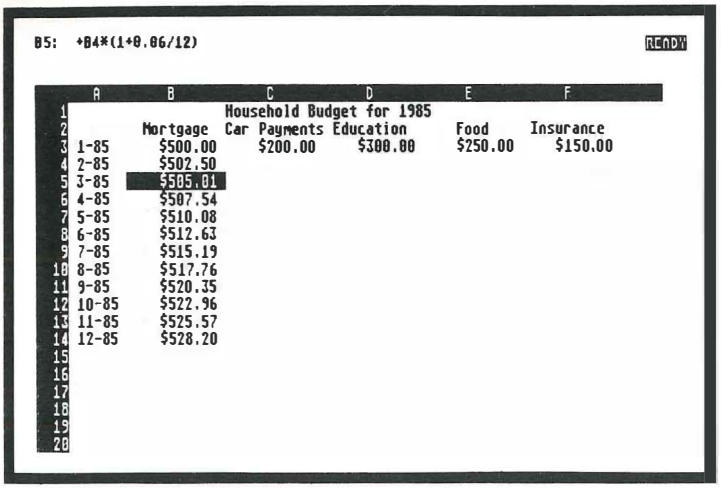
One more way you could use Copy is by typing in the target range. First, enter the source range by pressing [Return] while the cell indicator is in B4. If the cell indicator had not already been in the source cell when you were prompted for the source range, you could have specified it by typing in its coordinate (column letter, then row number) and pressing [Return]. You will then be prompted for a target range. VIP Professional automatically assumes that the cell where the cell indicator sits is the start cell of the target range. This is not, however, where you want to start the target range. Therefore, type in "B5", then [.], and finally "B14". Press [Return] to enter it.

If, at any time before entering both Copy ranges, you decide to start anew, press [Escape] or click the mouse button over the Escape icon once to erase either range. You may press [Escape] one more time or press [Control][Undo] (for a break) to be returned to the Ready mode. Once back in the Ready mode, you can specify the source and target ranges from the beginning, or you may select another course of action.

Relative, Absolute and Mixed Cell References

Coming back to our example, you will notice that although you copied a formula, all the cells show numbers. In fact, all the cells show increasingly greater numbers. This is just what you intended. The goal was to multiply the amount of the item of the previous month by the inflation factor of 1.005.

But wait a minute. Wasn't the cell reference in the formula to B3? Sure. So why did the numbers get bigger? Move the cell indicator to cell B5. Look at the cell reference there:



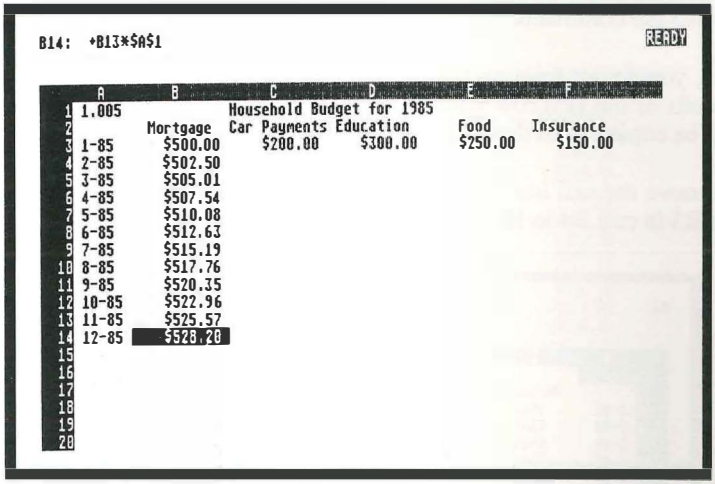
Relative References in Copy

The formula in that cell is: +B4*(1+.06/12). How did the B3 become B4? By some fancy footwork. If you check the formulas from B4 to B14, you will notice that as you go down from cell to cell, the cell reference changes with each new cell. VIP Professional knew that as you moved through the months for your budget, you would want to continue to reflect the monthly increase due to inflation by multiplying the succeeding amounts of each month by the inflation rate.

This change in cell reference is done automatically by VIP Professional to help you with your calculations. It is assumed that when you copy formulas, you want all cell references to be "relative". That is, you want the cell references to be changed to reflect the relative movement of the formula. Here, we wanted the formula to act on the preceding cell, so VIP Professional changed the cell reference to make sure this happened for each cell of the copy series. The program will make references relative in whatever direction the target range lies from the source range.

Of course, sometimes you will not want the cell references to change. You want them to be "absolute". This would be helpful if you wanted the amount in every cell to be multiplied by the same amount every time.

For example, we want the amount in each succeeding cell to be multiplied by the inflation rate. What if we did not calculate that rate in each cell with the formula (1+.06/12), but instead, got that number from, say, cell A1. The formula in cell B4 would then look like: +B3*A1. If we copied that formula from B4, and let VIP Professional use relative references, the formula in cell B14 would be: +B13*A11:



Using Absolute References in Copy

Although we want the reference to cell B3 to change relative to the copy, we want the reference to A1 to stay the same. Otherwise, who knows what the result would be? After all, A11 has the label "9-85".

There is a way to let the reference to cell B3 change relative to the move while keeping the reference to cell A1 the same (that is, absolute). This would be done by editing the formula +B3*A1 to read: +B3*A$1. The "$" indicates to VIP Professional that the coordinate which follows is not to be altered during a copy. Since the coordinate "A" would not change during a copy down, you only have to put the "$" before the coordinate "1". When only half the reference is absolute, it is called a mixed reference. Of course, you could put a dollar symbol before both coordinates to be safe. This makes the reference absolute.

Copying Whole Ranges

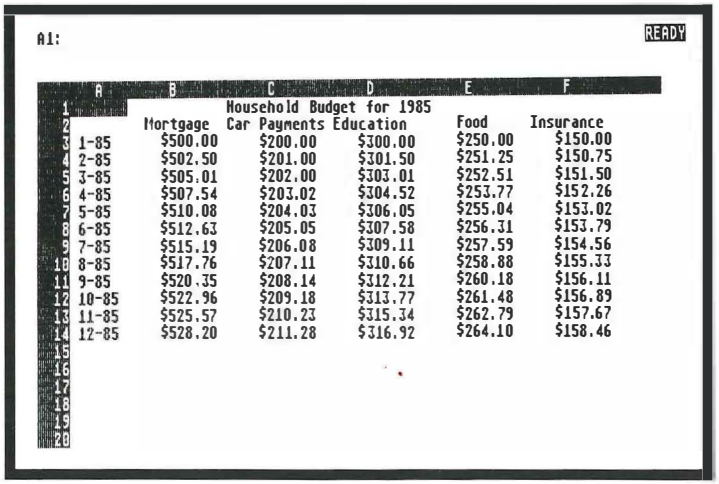
Let's try out your knowledge about copying ranges with another example. With the cell indicator on cell B4, select Copy (/C). For the source range, press the mouse key while the pointer is over cell B4 and drag the pointer to cell B14. Let up on the mouse key and click on the Checkmark icon or press [Return]. To specify the target range, press the mouse key over cell C4, and drag it to H4, then let up. Click on the Checkmark icon or press [Return]. What you are doing is copying a portion of column B to columns C through H.

If you are using the keyboard, you should specify the source range by placing the cell indicator in cell B4, pressing [.], then moving the cell indicator with the [Down] key to cell B14 and pressing [Return]. Specify the target range by placing the cell indicator in cell C4,

pressing [.] and moving the indicator to cell H4 using the [Right] key. Finally, press [Return] to finish the command.

In either case, you do not have to indicate the entire target range from C4 to H14. Just the first and last cells of the first row will do fine. The program will know that you mean the entire range to be copied from there.

Now, if you move the cell indicator to cell H4, you will notice that the cell reference has changed from B3 in cell B4 to H3 in cell H4. VIP Professional strikes again!



	A	B	C	D	E	F
1		Household Budget for 1985				
2		Mortgage	Car Payments	Education	Food	Insurance
3	1-85	$500.00	$200.00	$300.00	$250.00	$150.00
4	2-85	$502.50	$201.00	$301.50	$251.25	$150.75
5	3-85	$505.01	$202.00	$303.01	$252.51	$151.50
6	4-85	$507.54	$203.02	$304.52	$253.77	$152.26
7	5-85	$510.08	$204.03	$306.05	$255.04	$153.02
8	6-85	$512.63	$205.05	$307.58	$256.31	$153.79
9	7-85	$515.19	$206.08	$309.11	$257.59	$154.56
10	8-85	$517.76	$207.11	$310.66	$258.88	$155.33
11	9-85	$520.35	$208.14	$312.21	$260.18	$156.11
12	10-85	$522.96	$209.18	$313.77	$261.48	$156.89
13	11-85	$525.57	$210.23	$315.34	$262.79	$157.67
14	12-85	$528.20	$211.28	$316.92	$264.10	$158.46
15						
16						
17						
18						
19						
20						

Copying Ranges to Ranges

What you have learned about relative, mixed and absolute references applies not only to the Copy command, but also to the Move command. After all, the Move command is just a Copy command combined with an Erase command.

Let's do one more sample using the Copy command and then we'll move on to something new. Let's put a total line across the last amounts of the columns. First, select cell A15. Now type: "\-" and [Return]. Do you remember what this is? The "\" is a label indicator which makes the following characters repeat across the cell. Here, we have the dash repeated across the cell. Now, use the Copy command to copy this cell from B15 to H15. You already know this, so go ahead:

A15: \- READY

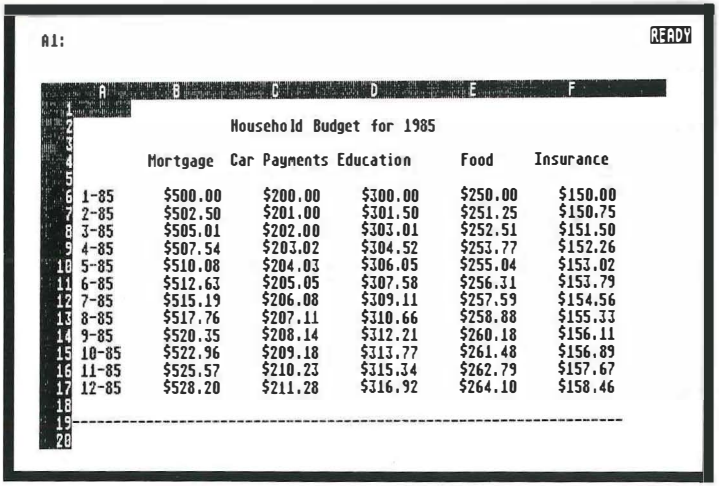
	A	B	C	D	E	F
1			Household Budget for 1985			
2		Mortgage	Car Payments	Education	Food	Insurance
3	1-85	$500.00	$200.00	$300.00	$250.00	$150.00
4	2-85	$502.50	$201.00	$301.50	$251.25	$150.75
5	3-85	$505.01	$202.00	$303.01	$252.51	$151.50
6	4-85	$507.54	$203.02	$304.52	$253.77	$152.26
7	5-85	$510.08	$204.03	$306.05	$255.04	$153.02
8	6-85	$512.63	$205.05	$307.58	$256.31	$153.79
9	7-85	$515.19	$206.08	$309.11	$257.59	$154.56
10	8-85	$517.76	$207.11	$310.66	$258.88	$155.33
11	9-85	$520.35	$208.14	$312.21	$260.18	$156.11
12	10-85	$522.96	$209.18	$313.77	$261.48	$156.89
13	11-85	$525.57	$210.23	$315.34	$262.79	$157.67
14	12-85	$528.20	$211.28	$316.92	$264.10	$158.46
15	-------	----------	----------	----------	----------	----------
16						
17						
18						
19						
20						

Using the Repeating Label

Inserting Space for Beauty

It's about time we make the sheet look a little more organized. I don't like to have my titles placed so close to the top of the worksheet. How about a little elbow room?

Let's insert some rows at the top of the sheet. Move the cell indicator to cell A1 and select Worksheet Insert Rows (/WIR). You are prompted for a range. The program wants to know how many rows to insert into your worksheet. For our example, we only want to insert one row, so just press [Return]. Now, use the Worksheet Insert Rows command again and insert some more rows so that your worksheet looks like the one in the diagram below. Remember, use your arrow keys to show how many rows you want inserted from the point where the cell indicator rests when you start the command procedure.



Inserting Three Rows

If you were to inspect cell B4, which has now been changed to cell B7, you will see that the cell reference has been changed from B3 to B6. VIP Professional always tries to keep the integrity of your worksheet. Cell references are changed to reflect insertions or deletions of columns or rows to make sure the calculations are always correct. Of course, labels will also be moved.

Some Helpful @ Functions

There are several functions which can be used as formulas or parts of formulas by VIP Professional. These are the @ functions. The @ functions, which (like formulas) are considered values, are system-supplied operations that can be used to perform special tasks, such as determining the sum of a column or row, finding the average of several figures, or performing logical operations. Many of these operations go beyond the simple arithmetic operations allowed by the system; others integrate frequently used formulas in one command to save you the effort of typing them in each time.

@ Functions start with the "@" symbol, followed by the name of the function. Since "@" indicates a value entry, no other formula marker is needed. Functions are often performed on an "argument" which must immediately follow the function and which must be enclosed by parentheses. The term "argument" is technical jargon meaning the object of the function. An argument specifies the values to be operated on. It may be a number, a cell reference or a series of numbers or data.

The entire list of functions is contained in the section devoted to them. To acquaint you with the use of @ functions in this section, we will take you through an example using one of the most commonly used of these, the @SUM function.

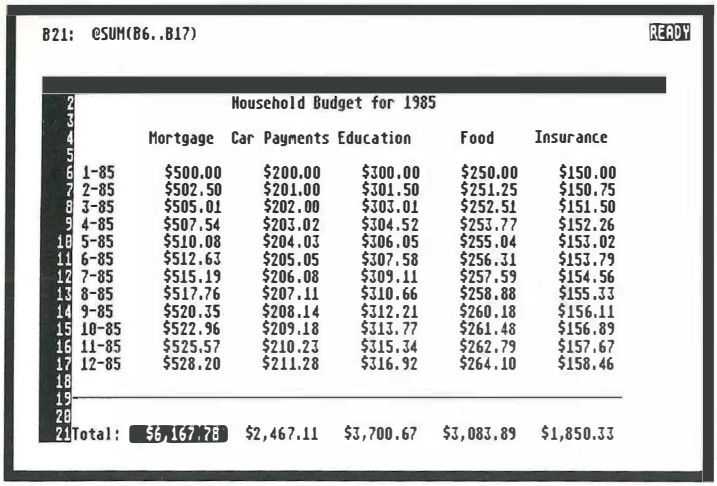
@SUM is used to find the sum of a series of numbers. We can use it with our sample worksheet to sub-total each of the expenses we have listed, and then to find the grand total of all our expenses during the year.

@SUM takes a series of values as an argument. Obviously, when you take the sum of values, there has to be more than one value. The series is placed within parentheses. A series may consist of single cells, a range of cells, or a combination of both. If it consists of noncontiguous cells, each cell reference must be separated by a comma; the first and last cell of a range of cells must be separated by a period. There are two ways to specify a series: by typing in the values or their cell addresses, or by pointing to them.

Let's try it out. Here, we want to find the sum of the values in cells B6 to B17, then the sum of corresponding values in the next column and so on through column H. Then, we want to find the sum of these subtotals.

The first step is to put the cell indicator on cell B21. Start the function by typing "@SUM(". Now to specify the series. You could just continue typing "B6.B17)" and press [Return] to enter it. That's OK when you know the coordinates cold. But when you are less sure, it is usually better to select the coordinates. To do this, move the pointer to cell B6, press the mouse button, and drag the pointer to cell B17, then let up on the mouse button. If you are working from the keyboard, move the blinking indicator to B17, press [.], then tab up to the start of the column. That'll take you to B3.

In either case, you will see that the formula now looks like: @SUM(B6.B17. You're not quite done. If you press return now, VIP Professional will beep at you. You still have to close the parentheses. Do it, and press [Return]. The sum is shown in B21:



Figuring the @SUM

Now, to get the sums of the other expenses, copy the function in B21 to a range from C21 to H21. You should know how to do this by now.

Finally, add the subtotal sums for the grand total. Select cell H23. Then type: "@SUM(". Now select the range by dragging the pointer from B21 to H21. Or move the blinking indicator to H21, press [.], then tab left to get to B21. End the function with a ")" symbol and press [Return]. You have just completed a simple home budget for an entire year.

You done good!

Lesson Six:

Windows and Titles

Introduction

It has become obvious that even with the large worksheet display available with VIP Professional, you usually cannot view your entire worksheet at one time on the screen. This can be troublesome if you want to remember the titles of your categories as you view areas further down in the worksheet or if you wish to compare the effects of changing the formula in column A on the results in column O or BK. Two VIP commands take care of these concerns: the Worksheet Window command and the Worksheet Titles command.

Your Many Windowed Worksheet

Sometimes, you need to compare different portions of your spreadsheet which are not on the screen at the same time. To do this, you would use the Worksheet Window command.

The Window command allows you to divide your text into two separate screens, each of which displays a different part of the worksheet. This allows you to change a formula or figure in one part of your worksheet and immediately see the result in other related parts. For example, you might want to see how the change in one expense affects your net assets, your gross earnings, and any number of other results which are not normally displayed on the screen at the same time.

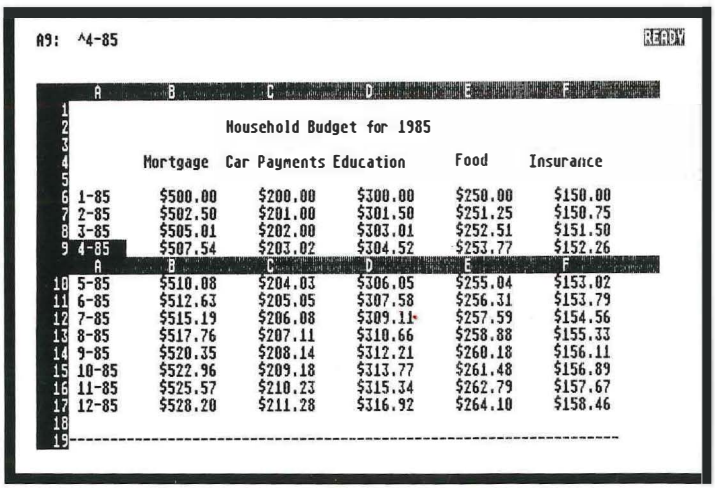
Windows use the same grid pattern as the original worksheet. All commands which will work on the worksheet as a whole, except commands for printing or saving, will work separately on each of the windows.

You may create vertical or horizontal windows. Windows are created either through the Worksheet command menu or by using the mouse. Using the mouse is probably the easiest and, certainly, the most fun way.

If you move the cell pointer to the top of the worksheet window (below the columns border), you will notice that the pointer changes into a grooved square which is used as a grabber. It allows you to grab windows and columns. To create a horizontal split, grab the line below the columns border; to create a vertical split, grab the line to the right of the rows border. Just drag the line to where you want the screen split, and let up on the mouse button. If you want to go back to one window, grab the line and bring it back to where you got it from.

From the Worksheet menu, windows are created at the position of the cell indicator. To create a horizontal window, place the cell indicator in the row which is to become the top row of your second window, and select Worksheet Window (/WW). Next, select Horizontal. The display will then be divided into two windows. The cell indicator will have moved up one row from where it was originally placed, into the source window.

In our budget example, we might want to see how changing some of our expense assumptions in row 6 affects the totals in row 21. To do this, we would create a window at row 10. Using the mouse, drag the columns border line to row ten and let up on the mouse button. (Did you notice how the pointer turned into a grabber when you moved it to the columns border?) Using the Worksheet menu, we would place the cell indicator in cell A10 and select Worksheet Window (/WW), then Horizontal (H). The results would look like:



A Window on Your Budget

Notice that the cell indicator moved to cell A9 from cell A10. This is normal. You are in the top window. To get to the second window, you can either select the desired cell with the mouse, select the Window Function from the VIP menu, or use [Function 6]. This will take you to the first row of the second window (A10, to be exact).

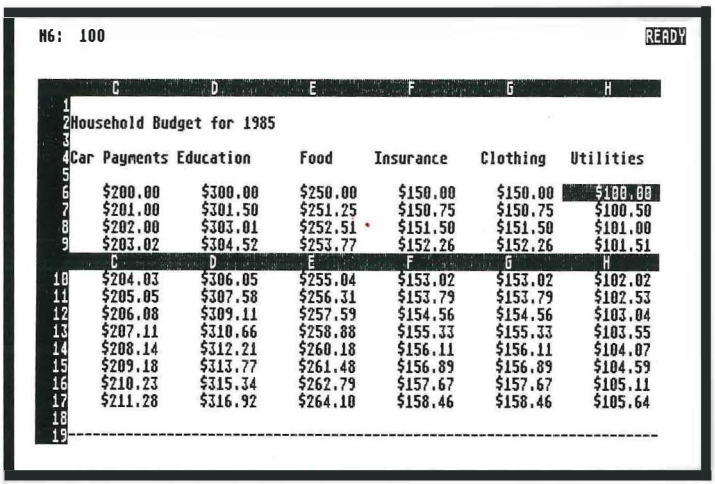
Your windows initially use the same formats as the worksheet did before you created the windows. Later, you can change either window's format independently. As we've mentioned, you can use any of the commands on the individual windows. This excludes Print commands and some of the File commands. When you save your worksheet with windows set, these settings are saved too.

Synchronizing Windows

The Worksheet Windows command offers several options. You can choose a horizontal or vertical split for the window, you can control the synchronization of the movement of your windows and you can clear all windows.

To begin with, windows have synchronized scrolling in the direction of the split. This means that whenever you scroll one horizontal window to the left or right, both windows will scroll together, keeping the same columns on the screen. However, if you scroll up or down, the windows will move independently. The opposite result is obtained if you create a vertical window; scrolling up and down is linked, while horizontal scrolling is independent.

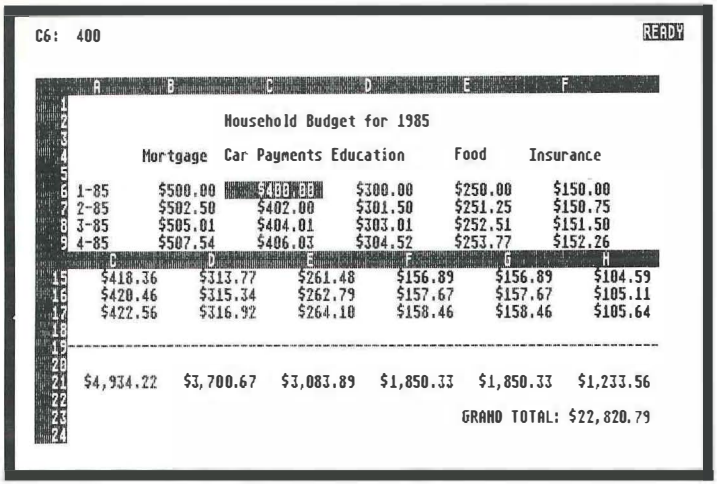
In our example, move the cell indicator in window 1 to cell H6, which is off the screen right now. Notice how both windows now show column H:



Synchronized Horizontal Scrolling

Now select the Window function [Function 6] to move the cell indicator into the lower window (or, if you are using the mouse, move the cell pointer to the lower window and click the mouse key). Scroll down until row 23 comes into view. Notice that the contents of the upper window remain the same while you are scrolling. With a horizontal window, you can freely move up and down without scrolling the other window.

If you wanted to, you could unlink the scrolling altogether. To do this, you would select Worksheet Window Unsynchronized (/WWU). Scrolling is unlinked. Separate scrolling can be useful, for example, to keep one section of your worksheet on the screen while moving to areas farther away in the other window to make changes.



Vertical Movement with a Horizontal Window

Now that you have your windows in place, let's find out just how useful they are. With your mouse or arrow keys, move the cell indicator in the upper window to cell C6. Let's find out what happens if you buy another car, and thus double your car payments. Change the amount in cell C6 to $400. After you do this, you will be able to see the resulting change to your yearly total for car payments and to your grand total in the lower window. You could change any other amount or ask "What if?" questions as well. Without the windows, you would have to make the change, scroll to the Totals rows and see the result of the change, then move back, and so on.

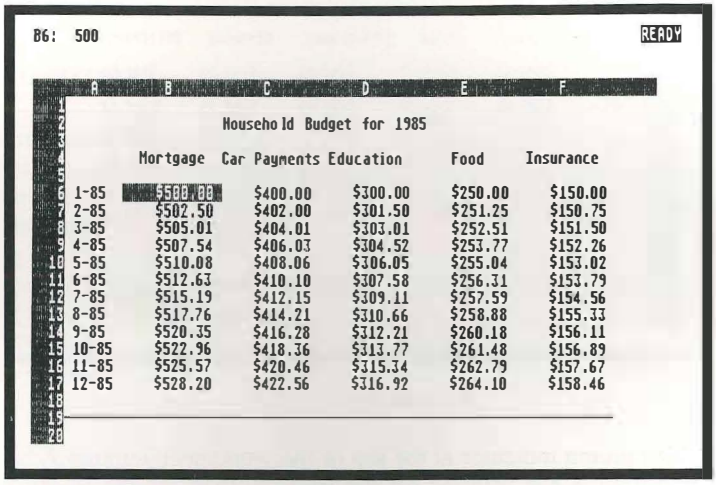
If you wish to eliminate your windows, you may use the grabber to drag the line back from where it came, or you can select Worksheet Window Clear (/WWC). When you do this, the screen will no longer be split, and the cell indicator will return to its last position.

Locking Titles

You have noticed that, as you scrolled to see the amounts in the Utilities column, the month/year column scrolled off the screen. As you scrolled to see the amounts in the totals rows, the labels at the top of the sheet scrolled off the top. This could be downright inconvenient, since you need to remember which month and which category each amount is assigned to. To help with this common problem, a Worksheet Titles command has been created.

The Worksheet Titles command is used to "freeze" your "titles" in place, horizontally, vertically, or both, so that they will stay on the screen while you scroll the rest of your

worksheet. "Titles" is a term for any data you have in a particular row or column, or both, which helps label the information in your worksheet. A good example is the month/year information in column A and the categories in row 4 of the worksheet.



B6: 500 READY

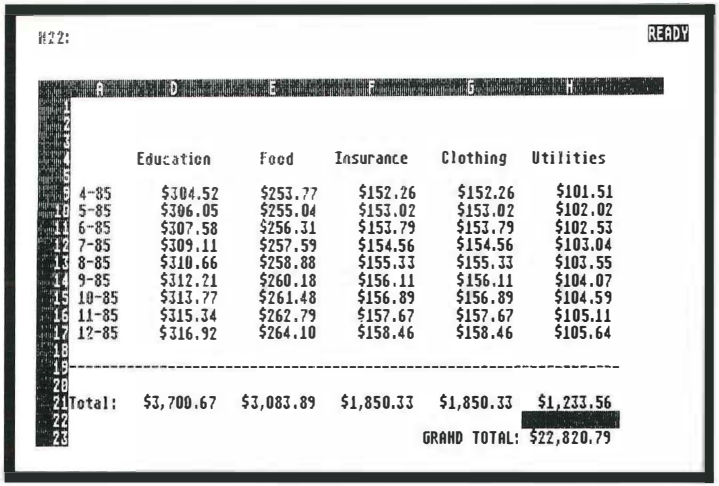
	A	B	C	D	E	F
1						
2			Household Budget for 1985			
3						
4		Mortgage	Car Payments	Education	Food	Insurance
5						
6	1-85	$500.00	$400.00	$300.00	$250.00	$150.00
7	2-85	$502.50	$402.00	$301.50	$251.25	$150.75
8	3-85	$505.01	$404.01	$303.01	$252.51	$151.50
9	4-85	$507.54	$406.03	$304.52	$253.77	$152.26
10	5-85	$510.08	$408.06	$306.05	$255.04	$153.02
11	6-85	$512.63	$410.10	$307.58	$256.31	$153.79
12	7-85	$515.19	$412.15	$309.11	$257.59	$154.56
13	8-85	$517.76	$414.21	$310.66	$258.88	$155.33
14	9-85	$520.35	$416.28	$312.21	$260.18	$156.11
15	10-85	$522.96	$418.36	$313.77	$261.48	$156.89
16	11-85	$525.57	$420.46	$315.34	$262.79	$157.67
17	12-85	$528.20	$422.56	$316.92	$264.10	$158.46
18						
19						
20						

The Month/Year-Category "Titles"

With the Worksheet Titles command you can freeze your titles in the direction you want so that they stay on the screen while the rest of the worksheet scrolls. Let's use the Worksheet Titles command to freeze the row and column of labels in our budget.

Freezing titles is controlled by the position of the cell indicator. Titles are frozen from columns to the left and/or in rows above the cell indicator to the end of the current screen display. Here, move the cell indicator to cell B6 and select Worksheet Titles (/WT). Then, select Both (B) since you wish to freeze both the information in column A and the information above row 6. These titles are now frozen.

The split created by the titles command is shown by a solid line below and/or to the right of the columns and/or rows locked in. When you scroll the worksheet, the titles will stay in place while the rest of the worksheet moves. For example, move the cell indicator to cell H22. You will see:



Column A is Frozen

Notice that in the column indicator at the top of the worksheet, column A is not followed by column B. Column B has scrolled off the sheet so that column H can be displayed. Also, in the row indicator, the next row after row 5 is not 6.

Now try to move the cell indicator into cell A1 using your arrow keys. Any way you try, you won't be able to move the cell indicator to cell A1. This is a protection feature. It is assumed that you want the titles to stay the same, since they label your worksheet. VIP Professional therefore protects your titles from accidental alteration.

There are, however, some ways to get the cell indicator to a cell in the Titles area. The first way is by using the GoTo command [Function 5]. By using this command, you can alter any of the titles. The other way to move into a Titles area is by using your mouse to move the cell pointer into the Titles area, then clicking the mouse button. In either case, you will not actually enter the Titles area. Instead, a duplicate set of cells will be created starting with the cell selected. Any changes you make to these cells will also appear in the Titles area. The next time you scroll or page, the duplicate cells will disappear.

If you no longer want your titles frozen, you can unfreeze them with the Worksheet Titles Clear selection (/WTC).

Lesson Seven:

Graphing Your Budget

Introduction

VIP Professional has advanced graphics capabilities. Using data from your worksheet, VIP allows you to create five different types of graph, display them in color or black and white, then print them. The different types of graph are: Pie chart, Bar graph, Stacked-bar graph, Line graph and XY graph.

To make each of these graphs more useful, you are allowed to add labels, grid lines, titles, etc. These options, along with the other commands used especially for graphs, are governed by the Graph menu.

Making a Graph in Three Steps

The first job in creating any graph is to organize your spreadsheet so that the data can be used in the graph. To be used, all graph data must fit within a range or ranges. Using ranges to create a graph is most easily shown by actually creating a graph from our budget.

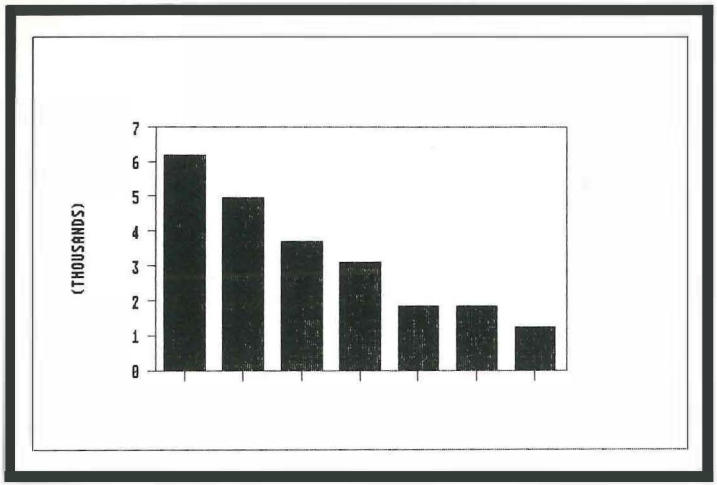
The next step is to choose the kind of graph we want to show. To do this, select Graph Type (/GT). We want to make a Bar graph, so select Bar.

The third thing you have to do is specify the range for the graph. You can have up to six ranges, that's the A thru F in the Graph menu. The different ranges are for graphing different sets of data.

We only want to graph one set of data: the yearly expense totals in cells B21 to H21. Since we only want to graph one set of data, we will first move the cell indicator to the first cell of the range, B21, then select the Graph A range (/GA). You will have to specify the range in response to a prompt. Use one of the methods we described before in Lesson Four.

Now that you have specified the range of cells for your graph, you have almost enough information to create the simplest possible graph. The next thing we want to do is specify whether to see the graph in color or in black and white. For now, we'll just stick with the default setting of black and white.

Let's take a look at our graph. Select Graph View (/GV) and a simple Bar graph will appear on your screen:



A Simple Bar Graph

You will notice that the graph has its own window. This window works just like the other windows in GEM. You can move it around the screen by dragging the Title bar, make it shrink or grow with a Full box, and make it disappear by using the Quit box. When you click on the worksheet window, the graph will go into the background and the worksheet becomes active. To reselect the graph, either click on the graph window or select Graph View. Whenever you reselect a graph, it will be updated with the latest data.

Let's look at what we have on the graph. You see seven bars on it. The bars have an identical pattern. The color of the bars depends on the color settings you chose (from the Control Panel item of the Desk menu).when you started the work session. Patterns and colors are used to help distinguish different ranges if you are graphing more than one range or set of data. Since all these bars were created from data of the same range, each bar uses the same pattern and color.

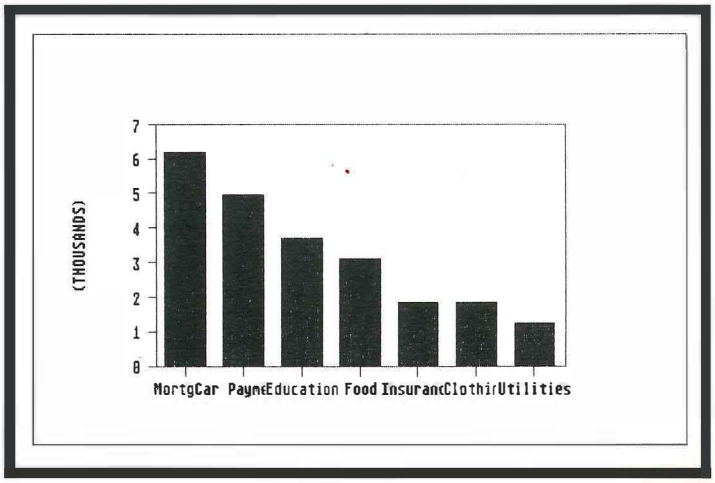
On the left side of the graph are scaling numbers. VIP Professional automatically creates a scale from the data it has been supplied, with the largest and smallest number, and standard increments in between controlling the scale.

OK, your graph looks good already. You can get back to your worksheet. If you are using a mouse, move the cell pointer back to the worksheet and click the mouse key. This makes your worksheet window "active" and the graph window "inactive". With a mouse, you may decide to keep worksheet and graph windows displayed side by side on the screen so that you can easily move back and forth. If you are using the keyboard, [Escape] will erase the graph display and return you to the worksheet display.

Some Graph Options

This is still a fairly dull graph. It tells you nothing, since there are no titles, labels or legends. We definitely want to have these. First, let's label each bar. Your graph has an X line and a Y line. The X line is the one across the bottom; the Y line is the one on the left side. Your labels go along the X line. There is a special command for assigning such labels to a Bar graph: Graph X (/GX).

When you select it, you will be asked for a range of labels. The X line labels are obtained from your spreadsheet. You will either use a range on your sheet which already exists or create a range for use. We already have a perfect range for our example: the labels in cells B4 to H4. If the Worksheet Titles command is still in effect (remember the locked title you created in the last chapter?), you will probably use the GoTo function (Fucntion 5) to move the cell indicator to B4 so that you can select the range. Once the cell indicator is over cell B4, you can select a range using the same method as you did with the Graph A command. Now, select Graph View (/GV) to take a look at your graph:

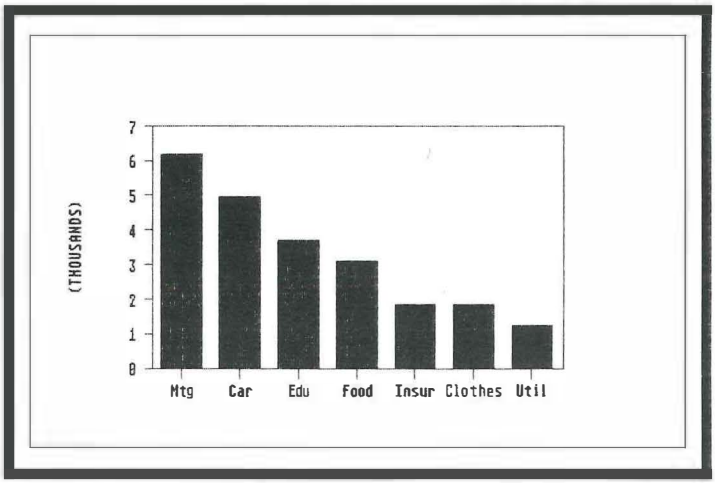


Some Messy X Labels

It looks a little messy. The problem is that your graph can only display a certain amount of characters (depending on font style and size) on a line. It had to truncate all your labels to get them to fit. To make the labels look neater, you could either shorten each of the labels in cells B4 to H4, or copy that range to B25 to H25, shorten the names in the copied range and select that range for your X labels. Let's do the latter so we don't have to change the budget itself.

First, use the Copy command (/C), with the source range as B4 to H4, and the target range as B23. Next, shorten the labels of the target range to: Mtg; Car; Edu; Food; Insur;

Clothes; and Util. Now, select Graph X, with the range B25 to H25. Move the cell pointer to the graph window and click the mouse key to activate it or, if you are working from the keyboard, select Graph View (/GV):



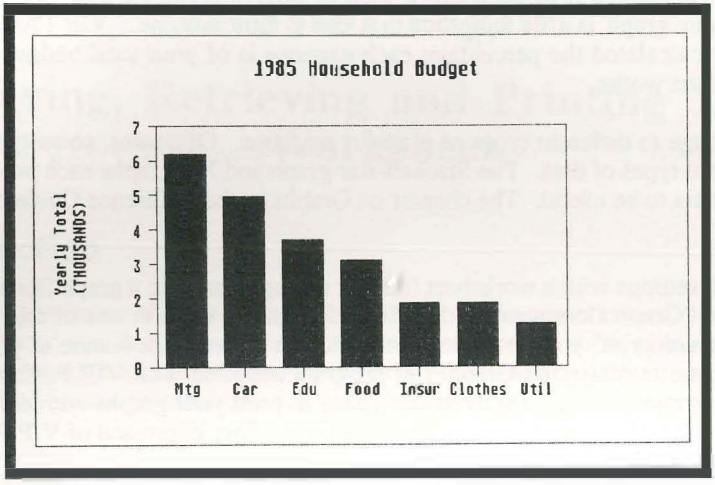
Your New X Labels

To view your graph again, you could have used the Graph function [Function 10] instead of /GV. The Graph function can be issued from the keyboard or from the VIP menu. However, it is used in the Ready mode, not the Menu mode.

Are you getting the knack of graphing yet? It's amazing how your learning begins to get easier as soon as you've learned some of the basic concepts of the program.

One of the last things we'll do with this graph is put in titles. Select Graph Options Titles (/GOT). We'll give a name to the graph, then we'll label the Y axis. Select First (F). You will be asked to give a name. Let's type in: "1985 Household Budget" and press [Return]. Now select Y and type in: "Yearly Total" and press [Return].

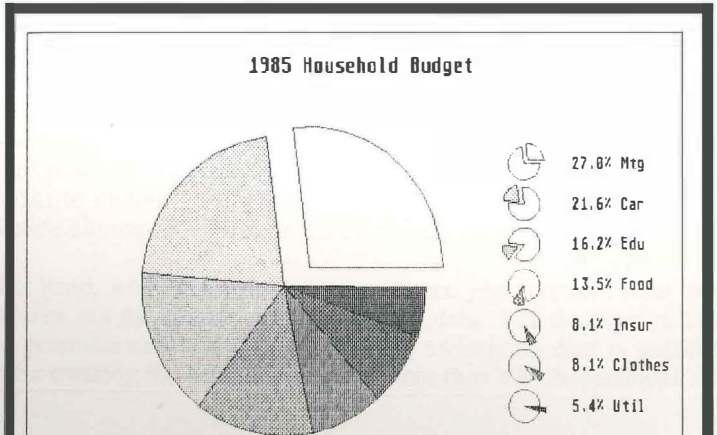
Let's look at your graph again. Move the cell pointer back into the Graph window and click the mouse key or, if you are using the keyboard, select Graph View (/GV) or use the Graph function:



A Bar Graph With Titles

There's much more you can do with a graph, but your sample one will give you an idea of how easy it is to make a graph. Graph options are discussed further in the Reference Guide.

Let's do one last thing: change our graph type. Select Graph Type (/GT). Now, select Pie. This'll change the type. Select Graph View or use the Graph function to take a look:



A Pie Chart of Your Budget

You will notice that the X labels are now used to label different parts of your Pie, and that the title of your graph is still there but that the Y title is gone. VIP Professional has automatically calculated the percentage each expense is of your total budget. That's just how the Pie chart works.

You can change to different types of graph at any time. Of course, some types of graph require different types of data. The Stacked-Bar graph and XY graphs each need more than one range of data to be useful. The chapter on Graphs in the Reference Guide explains this in detail.

Saving graph settings with a worksheet file and saving a graph in a graph file are discussed in the chapter, "Graph Commands". Printing of graphs is done in one of two ways. You may either "screen print" your graph using the built-in screen print feature of your Atari ST computer, or you may use the GraphPrint program supplied with VIP Professional. The GraphPrint program provides a convenient means to print your graphs with enhancements. Its use requires that the graph be saved using the Graph Save command of VIP Professional. The GraphPrint program is discussed in Appendix A.

On the other hand, you may only want a quick, convenient "picture" of what you have on your screen. In that case, you can use the screen print function. To screen print, all you have to do after you have set up your printer is press [Alt][Help]. A copy of what appears displayed on the screen will be printed out. For more information, consult your Atari ST user's manual.

Lesson Eight:

Saving, Retrieving and Printing Your Worksheet

Introduction

Now that you know the fundamentals of how to make a worksheet, you are probably wondering how you can print it, save it for later use or combine it with another program. Printing your worksheet is controlled by the Print commands, and the commands of the File menu are used for saving and retrieving your worksheet (among other things).

Your worksheet data has two separate aspects. One is the underlying commands for formulas, formats and display options which you have used to create your worksheet. The second is the display of results of the underlying formulas, etc. In other words, the first aspect is of the work you put into the worksheet, the second aspect is of the end results.

This dichotomy helps to explain a number of things. One important point to remember is the difference in memory required for both aspects. Although a file may take quite a bit of memory when displayed for use, it may only take a little bit of space when it is saved. This is because the amount of actual memory required to save the raw data is different from the amount of memory required to process and display that data. One thing you should know is that there is no direct correlation between the amount of disk space used to store the raw data and the amount of memory the worksheet will consume while it is being used.

When you save your worksheet to disk, what you are really doing is saving the underlying raw data used to create the sheet. You are not saving exactly what you see on your screen. Still, there are times when you want to save what you see on your screen instead, such as when you want to include it in a letter or report. The "File Commands" chapter of the Reference Guide discusses the file commands for this thoroughly.

On the other hand, when you print your worksheet, you normally want to print what you see on the screen, not the underlying formulas and data. Yet, there are still times when you will want to print the underlying data. Printing underlying data is useful for comparing formulas or for entering the data in a program other than VIP Professional.

Saving Your Worksheet

To save your worksheet, the first thing you must do is place a data disk in your drive. Next, select File Save (/FS). A list of current file names is displayed and you are prompted

for the name to be given to the file you want to save. You can specify the name either by highlighting it using the arrow keys or the mouse, or by typing it in. In any event, once the name has been selected, you must press [Return] or click "OK" with your pointer.

Since there are not, as of yet, any files on your data disk, give your worksheet the name, "Budget" and press [Return]. The first thing VIP Professional will do is check your data disk to ascertain whether there is already a file on the disk with that name. If there were, you would be asked whether you wish to replace (press [R]) that file with the new contents of the worksheet or cancel (press [C]) your request to save it. If you are using a mouse, you can click the mouse key over Cancel to cancel the save or over Replace to replace the old contents with the new. Since there is not yet a file on the disk called "Budget", the file will be saved without prompting. However, when you next save the file "Budget", you will be prompted.

To see if the file has been saved to the disk, select File List (/FL). Then, select Worksheet (W). A list of all worksheet files on your data disk will be shown. You will see the name "Budget.wks" among them if it has been saved.

VIP Professional has given your file a three character extension of "wks". This stands for "worksheet". This is just one of the extensions used by VIP Professional to help organize data. Other extensions are used to distinguish files "printed" to disk (.prn), and graph files saved to disk for printing (.gph). Don't worry about the extensions just yet. VIP Professional automatically knows which one is the right one and will attach it to the file names.

Retrieving a Worksheet

Once you have saved a worksheet, you can retrieve it from the disk with the File Retrieve command (/FR). If you were starting another session with VIP Professional and wanted to retrieve the saved worksheet called "Budget", you would use this command. From other programs, only files with the extension ".wks" can be loaded with the File Retrieve command.

Once you have selected File Retrieve, you will be presented with a list of current data files, provided you have a data disk in your drive. You may select the appropriate file by highlighting it using the mouse or the arrow keys, or you may type in the file name. Press [Return] to enter your selection and the file will be loaded.

The File menu has several other useful commands for extracting and importing files and the like. See the chapter on File commands in the Reference section for more information.

Printing Your Worksheet Display

The Print menu controls actual printing of copies, as well as the saving of the display for use with other programs. Obtaining "hard copy" of your worksheet results can be important for your records, for your reports or for comparison of results. On the other hand, you may wish to include parts of your worksheet in a report generated with another computer program, such as a word processor. For this, you would "print" your worksheet to a file on your disk, rather than sending it to a printer. In this case, we will be printing to the printer.

The first thing to do is to make sure that the ST is set up to work with your printer. For this, consult the *Atari Owner's Manual* and your printer's manual. Next, make sure that your printer is turned on, and has paper inserted. Now, on to the printing.

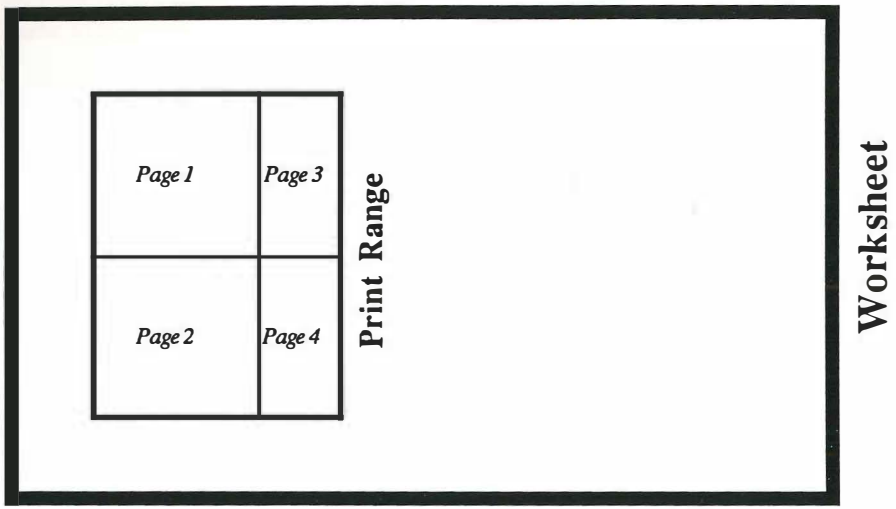
The fundamentals of printing are quite simple. (A considerable section is devoted to printing in the Reference Guide so that you can learn all the fine points.) VIP Professional prints the display of your worksheet only. It will print your data exactly as it appears on the screen, including all your special formats (ignoring windows). The program prints whatever range or ranges that you specify. You can print a selected portion of your spreadsheet or the whole thing.

To initiate printing, you select Print (/P). You are immediately presented with a choice of printing the worksheet to Printer or File. Let's go to the Printer (P).

The next step is to specify the Range. Select Range (R) from the Print Printer menu. You will then be asked to specify the range for printing. You should be familiar with how to set ranges by now. Remember that the Express icon can be quite useful in selecting the end cell of your worksheet.

When this is done, select Align (A) to tell the program that it will be beginning at the top of a new sheet of paper. Then, select Go (G) for printing to start.

Your worksheet will be sent to the printer one row at a time. What is printed is limited only by the size of the paper — it's width and length. If the worksheet is longer than one sheet of paper, it will continue to be printed on successive sheets of paper until it is all printed. Similarly, if the worksheet is too wide to be printed across one sheet of paper, after all the rows have been printed, the system will return to the first row and resume printing at the column where it left off. The printing sequence is diagrammed on the next page:



How a Worksheet is Printed

Those are the basics of printing. If you decide to alter the margins or use special features of your printer, you will have to consult the section devoted to printing options in, "Print Commands" of the Reference Guide.

However you have formatted your text, if you choose to print to a print file rather than to the printer, you should select File rather than Printer. When you choose Go, your work is sent to a print file. Print files are mainly used for importing and exporting text or for sending with a modem. They cannot be retrieved on VIP once they are saved. Instead, they can be retrieved by using a standard ASCII text processor.

To make matters simpler, printed files are automatically saved with a default extension of ".prn". This way, VIP Professional will not become confused when loading actual raw data for spreadsheets. Also, you will be able to distinguish which files you can combine with other application programs (the ones with the ".prn" extension).

If the work you want to print can be contained in one screen, you may decide just to go ahead and screen print it. When you press [Alternate] and [Help], your printer will print exactly what appears on the screen.

Now What?

Now that you have gotten through this tutorial, you should have a lot of questions about all the different commands and functions at your disposal, and how you can best use them. Great!

The reference section of the manual is devoted to discussing the commands and features available with each of the menus, including the Copy, Move and Quit commands and several other menus we haven't discussed in the Tutorial. We'll discuss formulas in depth and introduce you to such subjects as building macros.

The appendices contain information on how to print graphs and other useful subjects. You should also be sure to use the index to help you find the information you need for using this program.

As was stated earlier in the manual, spreadsheet programs have become very standard, and many books have been written about them. Therefore, advice on how best to create worksheets to meet your specific needs and what type of pitfalls to avoid when creating them will be left to those excellent works. Consult Appendix B for a list of several popular and excellent works.

Depending on your experience, you will almost certainly wish to consult one or more of these works since they contain many fine suggestions, hints, guidelines and warnings which should be heeded, not to mention the many templates (or designs for specific types of worksheets) which can make your job of creating a worksheet simpler. For optimal use of the program, we highly recommend that you use one of those books along with this manual.

Reference Guide

Reference Guide Introduction

Now that you have finished the VIP Professional Tutorial, you have become familiar with the program's general capabilities. The VIP Professional Reference Guide describes each of the commands and features of the program in greater depth. Since it is quite detailed, we suggest that you read each section when and as you need it instead of going through the Reference Guide page by page.

We do recommend that you read the first chapter before you read any other section of the Reference Guide. The first chapter describes the rules of data entry, along with explaining the use of different modes. The chapter ends with a description of the ten special functions which perform specific, advanced operations.

The chapter on formulas gives you information about when to use formulas and how they should be structured so that they can be calculated by VIP Professional. Different types of values, including the use of cell references to indicate values, are discussed. We also describe the operators (such as addition and subtraction) and @ functions.

The next chapter is devoted to keyboard macros. Keyboard macros are also known as typing alternatives. Keyboard macros attach a string of keystrokes (labels, commands, formulas and just about anything else which can be done from the keyboard) to a letter . When this letter is typed as a keyboard macro, the string of keystrokes associated with it is inserted in its place on the worksheet. There are several special commands associated only with macros which are explained in this chapter.

The last chapters of the Reference Guide are devoted to menu-related commands. These commands are arranged into different chapters, according to which menu they stem from. The first of the chapters introduces menu commands in general and gives information on using them. The chapter also describes the three independent commands Move, Copy and Quit.

The second chapter of menu-related commands covers the special menus, Desk and VIP. One of these menus (Desk) gives you information about the program and allows you to select such things as printer configuration and screen color. The other menu offers the ten special functions. It has one additional item called, "Goodies" which allows you to do such things as change type size and turn the grid display on and off.

The following six chapters cover each of the main menu items which govern separate aspects of the VIP Professional Program. The main menu items are: Worksheet, Range, File, Data, Graph and Print. We won't introduce the chapters individually here because it would take too long. However, each chapter is begun with an introduction which gives an overview of the aspect of VIP Professional the menu is responsible for and the various commands which stem from it.

The in-depth explanations of the Reference Guide are supplemented by a quick reference card which comes with your VIP Professional. The quick reference card presents you with easily accessible information on how to execute popular commands and functions.

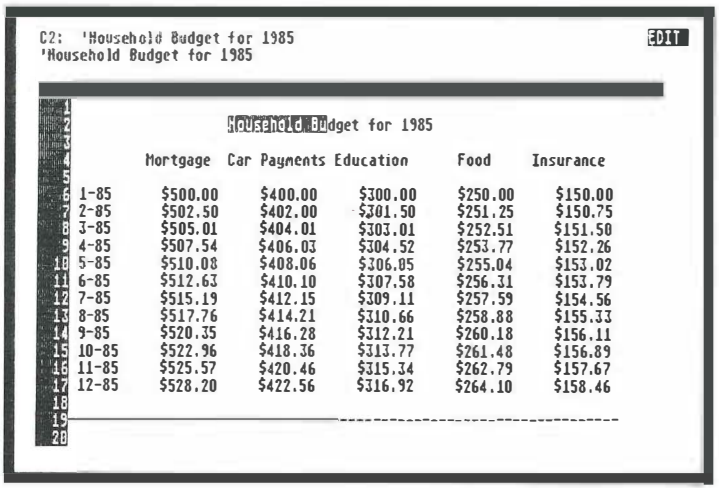
If you have problems locating information you need, there is a detailed index in the rear of this manual which can point you in the right direction. Four appendices ("Using GraphPrint", "How to Use Files Created with Lotus 1-2-3", "Reference Works" and "Introducing ASCII") give you further information on subjects not directly related to the VIP Professional program.

VIP Professional also offers on-line help to guide you through rough going. This on-line help is in the form of commands available to you (how to issue them and what they do). The help you will receive applies directly to the area you are working in. In some cases, it can be your most immediate source of assistance, so don't forget to take advantage of it!

A Summary of Worksheet Basics

Setting Entries

When in any cell, you can type an entry (value, formula or label) or issue a command. If you type an entry, you must enter it in the cell by pressing [Return] or by using one of the movement keys. While you are typing the entry, it will appear across the Edit line so you can see if you are making mistakes. A blinking cursor underscores the position of your next potential character. If there was an entry already in the cell, you can choose to edit the existing entry by going into the Edit mode or you may simply replace it with a new one by typing the new one in and entering it. The entry of the current cell appears on the Status line as well as in the cell.



Editing an Entry

[Return] is used to enter (or "set") values, labels and formulas in a worksheet. It signals to the computer that you have finished keying in information and that the computer can now process it. If you are using a mouse, clicking it once is an alternative to pressing [Return].

The arrow and other movement facilities can also be used to set entries in the Label or Value modes. After setting the entry, a movement key will move your position on the worksheet according to its function. For example, you may use [Right] to set an entry. After it sets the entry, it moves the cell indicator one cell to the right. Except for paging commands and [Up] and [Down], the movement keys are not used to enter data from the Edit mode. This is because the Edit mode has its own uses for the movement keys.

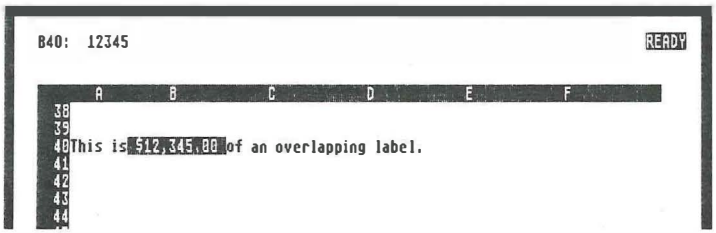
Different Types of Entries

When you enter data, VIP Professional knows the difference between the three possible types of entries by the prefixes used or by the first character of the entry. It is important that VIP Professional be able to tell the difference between these entries because each is used differently.

Values are the simplest type of entry. They can be used by calculations in other sections of the worksheet. Values are typed in as a number and [Return] is pressed to enter it. No prefix is needed.

Labels, unlike values, are usually text. They act as headings or explanations and are not used to calculate other areas of the worksheet. If you start typing text rather than numbers or number indicators (such as operational signs), VIP Professional understands that you are entering a label and goes into the Label mode.

An interesting difference between values and labels is that if a value does not fit in a cell, VIP remembers it but does not display it unless a format is used which allows a value to change to an exponent. Instead, asterisks are displayed throughout the cell. Labels, on the other hand, can spill over into the cell to the right if they do not fit within a cell, provided that the cell to the right is empty. This feature allows text processing. You are not limited to one-word titles. Instead, you can add sentences or even paragraphs of explanatory text to your worksheet.



A Label Spilling Over into Another Cell

There are four label-prefix characters which are used to indicate individual alignment for labels. If there is any doubt about whether you are entering a number or a label, these label prefixes remove it. In addition, they decide the positioning of the label in the cell. The four label prefixes are: ' for left alignment, " for right alignment, ^ for centering and \ for repeating the keystroke series across the cell. For instance, if you have a label such as "3rd Quarter", VIP Professional might assume that it is a value from the first character. However, if you use the ' character as a label prefix, there is no doubt that you intend it to be a label and that it should be aligned to the left edge of its cell. Label prefixes are discussed further in the "Range Commands" and "Worksheet Commands" chapters, under the Worksheet Global Label-prefix and the Range Label-prefix commands.

Commands, which also use letters, are preceded by the command prefix (the / character) so as not to be confused with labels.

Formulas are basically values. We only discuss them separately from values because they are more complicated than the average value. A narrower definition of formulas is that they are calculations which result in a certain value. It is this resulting value—and not the formula—which is usually displayed in the worksheet. Formulas are discussed fully in the chapter, "Building Formulas Using Operators and Functions".

Using Different Modes

VIP Professional distinguishes between the process used for entering a value/formula and entering a label by using different modes. These and several other modes are important when you consider that different things are done in each mode. For instance, the Point mode allows you to point to cells (or use cell addresses) as parts of formulas.

There are several different modes and processes used by VIP Professional. The more frequently used ones are: Ready, Label, Value, Point, Edit, Menu, Error, Wait and Find. Each mode governs which actions you may take and the effects of certain commands or keystrokes. The mode you are in is shown by the mode indicator.

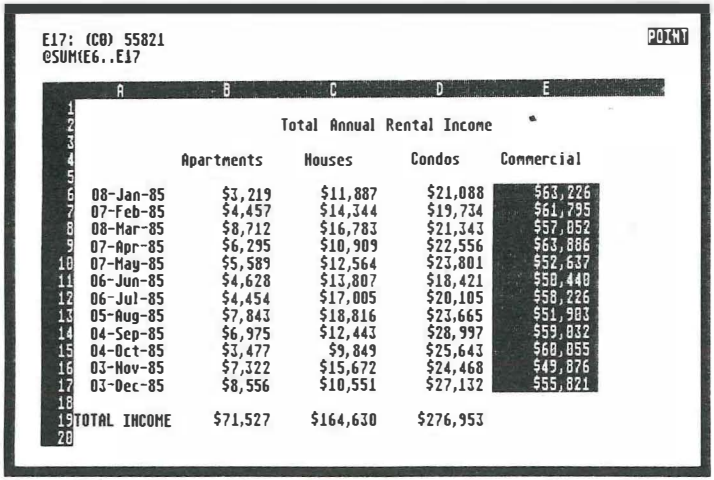
The Ready mode is the one in which the program starts. When you complete some action, VIP Professional returns to the Ready mode in preparation for your next action. From this mode, you are allowed to issue a command or start entering data. When you are in the Ready mode, you can also use your mouse and movement keys to move to any part of the worksheet. However, when you start invoking menu commands, the Ready indicator is erased from the screen. Until you are finished with or escape from the command sequence, you will not be able to move about your worksheet (this excludes such things as specifying ranges in response to prompts).

When you start typing a label prefix or text (excluding commands), VIP Professional places you in the Label mode. Anything entered while you are in the Label mode is treated as a label, not as a value/formula even if it is a number. Labels have different properties than values. The differences will become more apparent as your experience with VIP grows. You must complete the entry or press [Escape] to return to the Ready mode before you can move around the worksheet.

When you start typing a number or a number indicator (such as an operational sign), VIP Professional places you in the Value mode so that you may enter a formula or a value. When you have entered the value or if you press [Escape], VIP Professional returns to the Ready mode.

If, at some point when you are entering a formula in the Value mode you start to point at a cell which is to be included in a formula, VIP Professional will immediately change to the

Point mode. Once you have pointed to and set a cell reference in a formula, VIP Professional returns to the Value mode.

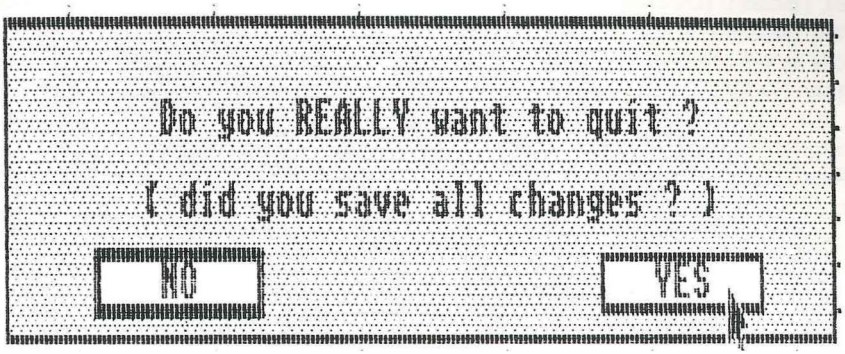


Pointing to a Cell

The fifth mode, the Edit mode, is used by VIP Professional for both labels and values. It provides you with more sophisticated editing procedures than those otherwise available. The Edit mode causes a value or label entry to appear on the Edit line as well as on the Status line. A blinking cursor appears at the end of the entry. You may move this cursor to any character of the entry and change that part without affecting the rest of the entry. When you reenter the value or label, the newly edited version will be used.

Menu appears in the mode indicator when you are selecting one of the menu commands. Until you are finished with a command sequence, or use [Escape] or [Break], you are limited to making the choices offered by the commands. You cannot start a command sequence, then, in the midst of it, choose to move around the worksheet and edit some entries.

The Error mode only occurs when Professional realizes you have made a mistake. The mode indicator changes to "Error". A prompt may be displayed on the screen to explain the type of mistake you have made. Once you have corrected your mistake (you may also have to confirm one of the options associated with the prompt), the prompt disappears and the mode indicator returns to Ready.



Example of a Dialog Box

The Wait mode is used when VIP Professional is processing a command. During this mode, no commands can be invoked or data entered.

The Find mode is similar to Wait in that no commands can be invoked or data entered during its duration. The Find mode is used during a Data Query operation, while the Professional is seeking for the records which meet the specified criteria.

How Modes Affect Keyboard Commands

As we stated earlier in this section, different key strokes have different effects in each of these modes.

In the Ready Mode:

When you are in the Ready mode, the mouse and the movement keys are used to move you around the worksheet. The movement commands are described in "Getting to Know VIP Professional". From the Ready mode, you may also begin to enter data or invoke a command.

In the Label, Value or Point Modes:

In the Label or Value modes, you have several functions available. These functions are: [Escape], [Break], [Delete] and [Backspace]. The functions are also available in the Point mode, but their use is slightly different then. [Escape] and [Break] are used in command sequences as well as in modes to move you backward one step at a time (with [Escape]) or through the whole series to the Ready mode (with [Break]).

By using [Escape] before you enter a label or value, you can cancel your entry and return to the Ready mode. Pointing to the Escape icon and clicking the mouse key has the same effect as [Escape] on labels or values: it cancels the entry on the Edit line.

Another function used in the Label and Value modes is [Backspace]. When [Backspace] is used while typing a label or a value, VIP Professional moves the cursor one space backwards and erases the character.

To Use:	Press:
Break	[Control][Undo]
Escape	[Escape]
Backspace	[Backspace]

If you are entering a formula and pointing to cell addresses, you are placed in the Point mode. To go back to the Ready mode from there and without setting the formula, you may use [Escape] twice. On the other hand, if you are in the Point mode, you may issue a [Break] as a shortcut. A [Break] will move you back to the Ready mode by automatically causing you to [Escape] from each mode you have gone through since you last left the Ready mode.

Not only do you revert to the previous mode each time you press [Escape], but, when you are in the Point mode, any cell you have just pointed to has its address removed from the formula you are entering. Using [Backspace] may therefore result in a circular reference formula (a formula which uses a reference which depends on the formula). It deletes the cell reference you just made while replacing it with the cell address of the formula cell.

In the Edit Mode:

The Edit mode may be entered in one of two ways. First, you may choose to enter the Edit mode whenever you are in the Ready, Label or Value modes by pressing [Function 2] or selecting Edit from the VIP menu. In addition, the system automatically places you in the Edit mode whenever you are prompted for data input from a command, or whenever you have made an error in data input which is caught by VIP. When in the Edit mode, the following keys have the specified functions:

Edit Functions

If You Press:	You Will:
[Delete]	Delete the character under the cursor
[Backspace]	Delete the preceding character
[Home]	Move to the entry's first character
[Insert]	Move to the entry's last character
[Tab][Right]	Move five characters to the right
[Tab][Left]	Move five characters to the left
[Right]	Move one character to the right
[Left]	Move one character to the left
*Any character key	Inserts text

In addition to the [Delete], [Backspace] and movement functions, you may also insert characters while you are in the Edit mode. VIP Professional does not replace already existing characters with those which are inserted. Instead, inserted characters are simply added at the spot indicated by the position of the cursor.

The movement keys are used in the Edit mode to move to a certain area in the label or value that needs to be corrected. [Backspace], [Delete] and the insert feature are used to correct the mistakes.

The arrow keys use the same repeat feature which they do in the Ready mode. Instead of having to press the arrow key repeatedly to move more than one space, you can continue to hold the key down after pressing it.

Special Functions

VIP Professional has ten special functions which help with various aspects of the program. These special functions are discussed further in the areas which pertain to them. However, we would like to present you with an overview of them here.

The functions can be reached from the keyboard by using the ten function keys. These ten special functions are also included in the VIP menu. Choosing the ten functions through their menu is discussed further in the Reference Guide under, "Desktop and VIP Commands".

Function Number	Function Name
1	Help
2	Edit
3	Name
4	Absolute
5	GoTo
6	Window
7	Query
8	Table
9	Calculate
10	Graph

[Function 1] is the Help function. If you are using a mouse, you may also get Help by clicking over the Help icon. From the keyboard, you may also press the [Help] key. If the Help disk isn't in the disk drive, your computer will beep and send you a prompt, which lets you know that you need to insert the Help disk or cancel the request. Help offers you condensed explanations of commands available to you in different aspects of your work along with directions on their execution. To return to your worksheet, press [Escape].

[Function 2] is the Edit function. From the Ready mode, this invokes the Edit mode. In this mode, you may edit the value or label entry of the cell you are currently in. Once you enter the label or value, VIP Professional will return to the Ready mode. If you are in the Edit mode when you use this function, VIP Professional moves to the mode you were in before entering the Edit mode.

[Function 3] is the Name function. In the Point mode, when you are prompted for a range, this function causes VIP Professional to display a list of your worksheet's currently named ranges. You may clear the list by choosing a name (point to one of its names and enter it) or you may simply press [Escape].

[Function 4] is the Absolute function. This function offers an alternative to the Absolute icon. While in the Point mode, it causes the cell or range you are referencing in a formula to be a relative, absolute or mixed reference (see "Building Formulas Using Operators and

Functions" for a discussion of the three types of references). Before using [Function 4], point to the cell whose address you wish to use in the formula. The Absolute icon will appear in the control panel. You may either click on it or press [Function 1] to make the cell reference absolute. If you continue to use the Absolute function, the address will cycle through the possibilities from completely absolute to mixed to completely relative. When the desired address type has been obtained, you may go back to the formula.

Example: Using the [Function 4] on A1 = $A$1 — A$1 — $A1 — A1 — $A$1 ...

[Function 5] is the GoTo function. This function, along with a typed and entered cell address, moves you to that cell whether it is protected or not. It can also be used to reach cells normally inaccessible in a Titles area (created by the Worksheet Titles command).

[Function 6] is the Window function. This function is used after you have created two different windows with the Worksheet Window command or with the cell pointer as grabber. By using this function, you can move from one window to another. If you are using a mouse, you may also move the cell pointer from window to window, then click the mouse.

[Function 7] is the Query function. After you use the Data Query command to find certain records, VIP Professional allows you to reapply this command using the most recently specified input range, criterion range and (if applicable) output range with the Query function.

[Function 8] is the Table function. This function allows you to recalculate the table in the Data Table 1 or the Data Table 2 command (depending on which was most recently used). Along with the most recently used data table, the Table function uses the most recent input cell(s) in its calculation. If you've just used Reset, the function is disabled until you specify another range and input cell(s).

[Function 9] is the Recalculate function. It forces a recalculation of the entire sheet. It may be used at any time. However, it is usually used in either of two situations. The first is when you have elected to use manual recalculation. When you enter data after having selected manual recalculation, the program will not recalculate the sheet automatically. Instead, you must manually force recalculation when you have finished entering your data. To recalculate, either click on the Recalculate icon or press [Function 9].

The other use for the Recalculate function is to calculate the result of a formula—a sort of built-in calculator. Whenever you are in the Value or Edit modes and are working on a formula, you may click on the Recalculate icon or press [Function 9] to make the program calculate the result of the formula on the Edit line. Since this will permanently change the formula into the resulting value, if you wish to continue to use the formula as is, you should first enter the formula into a cell and then perform this function in the Edit mode when you have a duplicate of the entered formula. When you press [Escape], the calculated version of the formula is erased, while the previously entered version remains.

[Function 10] is the Graph function. The Graph function is identical to the Graph View command. Used from the Ready mode, it allows you to see the most recently drawn graph. This function is particularly helpful when you are working on a graph and want to see how all the changes made in a worksheet affect your graph. As with the Graph View command, once you have finished viewing the graph, you may return to your worksheet by pressing [Escape] or by using any of the mouse options discussed in "Graph Commands".

Building Formulas

Using Operators and Functions

Introduction

This chapter defines formulas and describes how they can be built using operators and/or functions. An entire chapter is being devoted to formulas because, unlike labels or other value entries, the creation of formulas offers many possibilities and powerful features. The purpose of this chapter is to provide you with information about constructing a formula for a VIP Professional worksheet. In addition, we will list and describe all the operators and functions available with Professional.

Formulas can affect either single cells, a network of cells, or large portions of your worksheet. As you become more comfortable with them, you will find ways of using formulas in combination with a variety of VIP commands. For instance, as you discovered in the Tutorial, the Copy command may prove particularly useful for extending the power of a single formula because, with it, you can copy a formula many times over. In addition, the Worksheet and Range Protect and Unprotect commands offer flexibility by allowing you to protect your formulas from accidental change.

Defining Formulas

A formula is an instruction for VIP Professional to calculate a number (or value). Formulas may be entered in any cell.

Often you will construct your worksheet using both values and formulas. Many formula cells depend on value cells because they use the contents of value cells to obtain results for the formula. For this reason, value cells are called input cells. The cells containing formulas which reference the input cells are the output cells.

There are four general rules which apply to formulas:

1. A formula must begin with one of the following characters: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, ., +, -, (, @, #, or $. All characters other than the numerical ones, the decimal point, and $ (which is the absolute symbol) are operators. + and - can double as operators and as indicators of positive and negative values.

2. Like values, formulas appear in the control panel of the screen on the Edit line as you type them. [Return] (or any of the methods used for setting values described in "A Summary of Worksheet Basics") signals that you are finished typing the formula and that it

is to be entered into its cell. While in the Edit mode, formulas can easily be edited using standard editing functions.

3. A formula may not contain space characters when it is typed in.

4. Every formula consists of values and operators and/or @functions. Depending on the calculation type, when you refer to a value, you can either type in the numbers for it, use a cell address to indicate that the cell's contents be used as values, or you may specify a range by name or by cell addresses. An operator is a character which defines the operation performed on the value(s). An @function begins with "@" and a name which defines its operation.

Typing Characters

Typing the characters which symbolize the values and operation(s) is the simplest way to set up a calculation. To enter a formula this way, you must begin it with a formula prefix (one of the seventeen characters listed above) if it doesn't already start with one. Then, type in the characters of the first value, the symbol of the operator, followed by the characters of the next value and so on in a string until you reach the end of the formula. Do not use [=] to end the formula. Press [Return] to enter it.

Using Cell References in a Formula

There are two ways in which a value can be entered in a formula by referencing its cell. You may type the cell address or you may point to it using the mouse or movement keys. If you include cell references in a formula, VIP Professional automatically uses the values stored at the referenced cell whenever it calculates the formula. When there are changes to the contents of the referenced cells, VIP uses the new values and updates the formulas' results upon recalculation.

To avoid confusion, we call those cells in which a formula is entered formula cells. The cells which are used as references to values in a formula are called reference cells. In general, these can also be called output cells (formula cells) and input cells (reference cells).

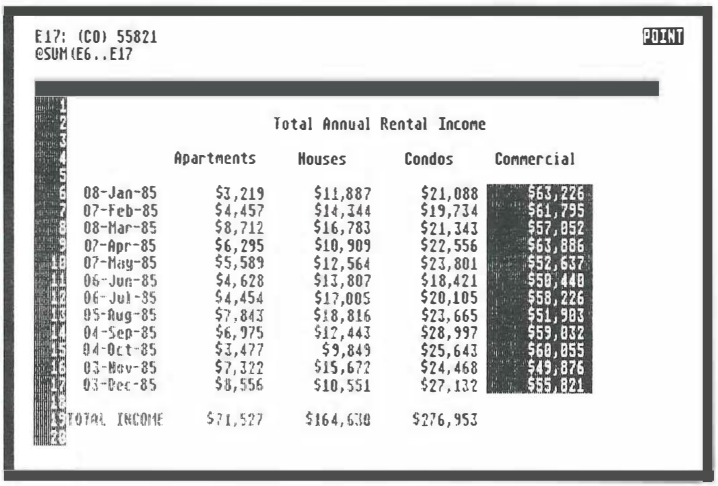
Typing:

When you type a formula with a cell address, begin by typing a formula prefix ([+] to indicate positive is the easiest to use), then the first cell address (column letter followed by row number), and so on. Press [Return] to enter your formula.

Pointing:

VIP Professional is a visually oriented program. This makes it easy to enter a formula by pointing to the reference cells. You may use your mouse or your arrow/movement keys.

To construct a formula using the pointing method, first type a formula prefix (usually [+]), then indicate the reference cell. With the mouse, you can move the cell pointer to the reference cell and click. Or, you can use your arrow keys to move the cell indicator to the reference cell. If the cell reference is at the end of the formula, set the reference and enter the formula at the same time by pressing [Return]. If another operator follows your reference in the formula, you may set the reference by typing the operator in. As soon as you start pointing to a reference cell, VIP Professional places you in the Point mode (see "A Summary of Worksheet Basics"). Type the next operator (notice that it returns you to the formula cell), and so on to the end of the formula. Press [Return] to enter the formula.



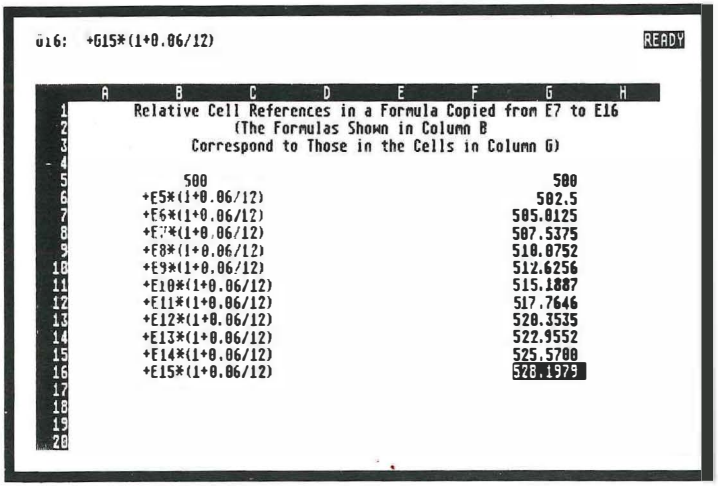
Constructing a Formula by Pointing to Cell Addresses

Relative and Absolute Cells

When you use cell references to build formulas, you are no longer referring to freestanding values. Instead, you are referring to the contents of cells. Thus, the value used in the formula is the current value contained in the referenced cell.

In addition, VIP recognizes that there may be a relationship or correlation between the cell which is referenced and the formula cell. Therefore, unless you specify otherwise, it automatically makes your cell references "relative".

A relative cell reference uses the distance between the referenced cell and the formula cell to establish its relationship. The distance is measured in the number of cells column-wise and the number of cells row-wise the referenced cell is from the formula cell. For example, if you have a formula in a cell whose address is C14 referencing cell B13, then the formula is actually taking the current value of the cell one cell up and one cell to the left of its location.



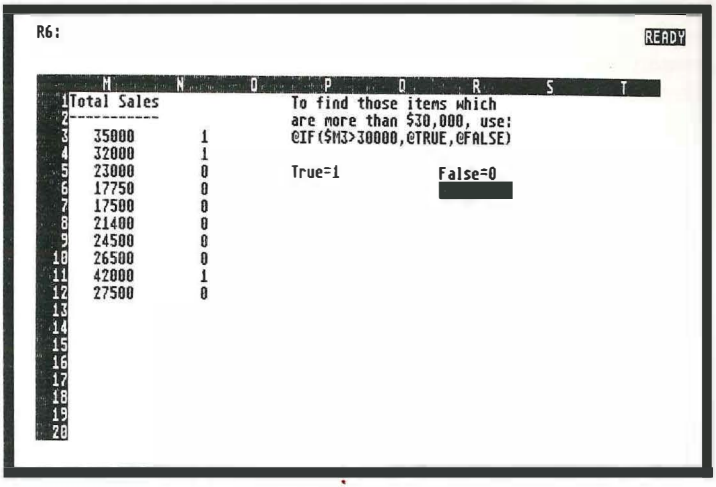
Using Relative References in Cells

If you only use a formula with a relative cell reference in one cell, its relative nature may not be apparent. However, once you start using the Move or Copy commands to change the location of the formula cell, the relationship becomes obvious. For example, if the formula in cell C14 which referenced cell B13 were moved to D15, then the cell reference would be changed to C14 because of its relative nature.

Formula cells can also be "absolute". By placing a dollar symbol ($) in front of the column letter and in front of the row number of the formula cell, you are letting the program know that the reference cell is absolute and not relative. When a formula is calculated with one or more absolute cells in it, no matter where the formula is located, an absolute reference will always refer to the contents of the cell at the original address. Named ranges can also be made absolute by putting a "$" before the name. This makes all cell acressed in the named range absolute when that range is used.

When a formula is written so that one column or row is absolute while the corresponding row or column of the cell address is relative (or vice versa), it is called a mixed cell reference. A mixed cell reference can be created by putting the absolute symbol ("$") before the part of the cell address, either column letter or row number, you want kept absolute.

The corresponding part of the cell address is left as is (relative). Mixed cell references are often used with formulas which are copied along rows or columns.



Using Mixed References in a Formula

By using the Absolute function [Function 4] when you are in the Point mode, you can run a cell or range reference through a cycle (absolute, mixed, mixed again, then relative). Point to your cell reference, then use the function. Each time you use the function it moves your reference one step further in the cycle. Using the Absolute icon has the same effect. Move the cell pointer over the Absolute icon. Each time you click the mouse key, the reference goes through one step of the cycle.

Revising Formulas

Like other types of entries, formulas can be revised while you are still typing them or when you are returning to them from another cell.

When you are in the Value mode and are typing a formula for the first time, you can use the [Backspace], [Function 2] and [Escape] keys to edit a formula. [Backspace] erases the character preceding the Edit cursor. [Escape] erases the entire formula you have been entering and returns you to the Ready mode. Once in the Ready mode, you can move to another cell or enter the same cell and retype your formula. [Function 2] places you in the Edit mode so that you can use the editing commands for major "surgery".

If you are in the Value mode and decide to point to a cell to use it as a cell reference, you will be placed in the Point mode (shown by the mode indicator). When you are in the Point mode, there are only two keys which can be used to revise your formula. The effect of these two keys is different depending on whether you are pointing to a single cell or a range.

If you are pointing to a cell range, VIP Professional uses [Escape] to shrink the range down to its anchor cell (the start cell of the range). It changes the anchor cell into just another single cell. You remain in the Point mode. If you use [Backspace], VIP Professional cancels the previously made range specification and returns the cell indicator back to the formula cell instead. You are still in the Point mode.

If you are returning to a formula cell and choose to enter the Edit mode, you will have more advanced editing features at your disposal. You will also be placed in the Edit mode if VIP Professional finds an error in your data when you enter it. The Edit cursor will be placed at the point of the error. Once in the Edit mode, you may use all the edting functions available with editing other entries. These functions are described in "A Summary of Worksheet Basics".

Precedence in Calculations

The order in which formulas are calculated often has a bearing on the result of the calculation. VIP Professional uses three factors to govern precedence in calculation. The three factors are: the order in which a calculation is entered (from left to right), the use of parentheses to determine subgroups which are isolated and calculated first, and the order of importance of the individual operators in a calculation.

Order of Entry:

When you enter a formula, you do it from left to right. If VIP doesn't have any other clue (parentheses or individual operators), it will calculate the formula the same way you entered it. For example, if you have a formula like "6-8+2", it won't try to add 2 to 8 before it subtracts the results from 6. If it did, you would have a final result of -4. The actual result obtained by the program is 0 because 6-8=-2, then -2+2=0. It doesn't matter whether you use freestanding values or cell references. If the individual operators have equal precedence and you haven't used parentheses, the formula will be calculated from left to right.

Using Parentheses to Indicate Subgroups:

When you use parentheses to indicate subgroups in a formula, the sections inside the parentheses will be isolated from the rest of the formula and calculated first. The results are then integrated back into the formula and used to calculate it as a whole. If we should decide to include parentheses around the formula in the example above, we might write the formula

like this: 6-(8+2). In this case, VIP would first isolate and calculate the part of the formula enclosed by parentheses (8+2=10). Then the result would be integrated back into the formula (6-10=-4).

Precedence of Individual Operators:

Individual operators also affect the way in which a formula is calculated. There are actually 16 different operators and seven "levels of precedence". A level of precedence is the amount of priority one operator gets over others. The table below lists (in order) the operator symbols and their operations.

Precedence	Operator	Function
1	^	Exponentiation
2	-	Make Negative
2	+	Make Positive
3	*	Multiplication
3	/	Division
4	+	Addition
4	-	Subtraction
5	=	Equal
5	<>	Not Equal
5	>	Greater Than
5	>=	Greater Than or Equal
5	<	Less Than
5	<=	Less Than or Equal
6	#NOT#	Logical Not
7	#AND#	Logical And
7	#OR#	Logical Or

Individual operators and their operations have priority over the order in which the formula is entered. Whenever possible, VIP Professional will try to do operations in the order of their operators' precedence. For instance, an addition operation (which has a precedence of four) is done after a multiplication operation (which has a precedence of three) even if the addition operation is first in the order of the formula. For example, in the formula, "7+4*10", the result is 47 (4*10=40, then 40+7=47).

Where parentheses are used to set off subgroups, those subgroups are still calculated first then integrated into the rest of the formula. Using the example above, "7+4*10", we could enclose the part of the formula we want done first in parentheses. The formula might now look like this, "(7+4)*10". The result is 110 (because 7+4=11, then 11*10=110).

Logical Operators

The logical operators =, >, <, >=, <= and <> are used to compare values. The result obtained from the use of a logical operator is either 1, (True) or 0 (False). For example, the formula 1=2 would give the result 0, since 1 does not equal 2.

Logical operators are frequently used with the @IF function, and to find information in databases. For example, a formula using a logical expression can be used as a criterion in a Data Query command. The construction of formula criteria is described in the chapter, "Data Commands".

Compound Statements

In addition to the logical operators described above, there are an additional three which have the precedence level of six (logical not) and seven (logical and, logical or). These logical operators are also compound statements. Compound statements are mathematical equations which meet more than one condition. For example, #NOT# finds all values which are not equal to the specified value. Therefore, #NOT# can be said to meet all conditions except the specified value.

#NOT# is used to find values which are not specified. For example, "#NOT#($A$13+2)" finds those values which are not equal to the current value of cell A13+2.

#AND# is used to find those values which fulfill all conditions set. For example, "+$A$13#AND#(>5)" finds those values which are equal to the value of cell A13 and greater than five.

#OR# is used to find those values which fulfill either one or the other of conditions set. For example, "+$A$13#OR#$A$15" finds those values which are equal to either the value of cell A13 or that of cell A15.

Calculating an Individual Formula

If you would like to know what a formula's result is without calculating an entire worksheet, use the Calculation function while you are in the Value or Edit mode and while the formula is displayed on the Edit line. You may also use the Recalculate icon for the same purpose when you are in the Value or Edit mode. Move the cell pointer over the Recalculate icon and click the mouse button. Your formula is calculated and the result is displayed on the Edit line instead of the entire formula.

Calculation Sequencing

Calculations and recalculations are performed by VIP Professional when you enter or change a value or formula in a cell. VIP Professional has been automatically set up to do these calculations. However, both automatic calculation and the order in which the calculation is done can be changed. Calculation type and order are determined by Worksheet commands and are discussed in more detail in the chapter, "Worksheet Commands".

Initially, VIP Professional performs calculations in a certain order called natural. With natural recalculation, VIP Professional calculates each cell by column, but when it encounters a reference to another cell, the contents of the reference cell are calculated and the resulting value used to calculate the formula cell before continuing. Forward references occur when the contents of one cell hinges on the contents of other cells which haven't been calculated yet. The method of natural calculation is, however, slower than the other methods. To return to this form of calculation after you've changed to another, you would use the Natural command from the Worksheet Global Recalculation menu (/WGRN).

Another option you have is calculating by columns without waiting for forward references to be solved. This speeds up the calculation process a bit. A third option allows you to have calculations performed along rows rather than down columns. You may require rowwise calculation because of a special way you have created your formulas. For instance, it may be necessary to calculate along rows first to avoid forward references which cannot be resolved by columnwise calculation. The Columnwise and Rowwise commands from the Worksheet Global Recalculation menu (/WGRC and /WGRR) are used to change calculation type to these options.

Automatic recalculation after each entry is time consuming, especially if you are using a large worksheet. At times, you may decide you want to turn off automatic recalculation and switch to manual recalculation.

First, select Manual from the Worksheet Global Recalculation menu (/WGRM). Now, you are free to enter data without having to wait for calculation after every entry. Whenever you do make a change in your worksheet, the Recalculate icon will appear on the screen to remind you that recalculation needs to be done for revised results. To recalculate, either click on the Recalculate icon or press [Function 9].

There may be times when you wish to force a recalculation or even additional recalculations. This happens frequently when particularly intricate formulas will not yield accurate results on first-time calculations. The most common culprit is an inappropriate re-evaluation order. To force recalculation at any time, use the Calculate function while in the Ready mode (or, with the mouse, the Recalculate icon). You can also specify a set number of iterations of the formula (recalculations) by using the Iterate command of the Recalculation menu.

Iterate is a command which is used to help with the calculation of numbers which are difficult to ascertain. VIP Professional allows you to control the number of calculations you want through the Iterate command. Choose Iterate from the Worksheet Global Recalculation menu (/WGRI). Then, type the number of desired iterations (any number between 1 and 50). Press [Return] to enter your choice.

Achieving Different Results with Calculations

Depending on the method of calculation you choose, it is possible to create a worksheet which will not give accurate results. This can be done in many ways, two of the most common being caused by circular references and forward references. Just as forward references occur when a cell refers to other cells which are generally calculated later in the sequence, a circular reference occurs when two cells refer to each other. These and other problems which may arise when creating worksheets are discussed thoroughly in texts devoted to spreadsheets. The texts discuss design, construction, and use of spreadsheets, along with many other hints for successful worksheet creation. In Appendix A, we refer you to those works which we feel are particularly useful.

If you should find yourself recalculating a worksheet with a circular reference, the Circular Reference icon appears in the lower section of the screen.

Two Special Values: NA and ERR

Two special values, "@NA" and "@ERR", are used to substitute values in cells with formulas which are impossible to calculate. NA means "not available". It is used when certain necessary values are not available. ERR is used when an error has arisen in calculation of the sheet, such as division by 0, or a reference to a cell in a range which has been moved. All cells which depend on cells with these values reflect this by displaying the same type of value. For example, if one cell containing a value of @ERR has four cells which depend on it for their values, than all five cells have the value of @ERR upon recalculation.

@ Functions

@ functions are built-in formulas. Some, such as @NPV (Net Present Value), replace what would otherwise be a very complex formula, while others, such as @SUM, serve as a substitute for a commonly used formula. @ functions also include logical operations which do not result in numerical values as such, but instead result in "True" or "False". A set of @ functions are reserved for use with databases. These @ functions begin with the letter D after the @ symbol. Their use is discussed in the chapter, "Data Commands", under the section, "Using Database Functions to Generate Statistics".

@ functions are constructed in a certain way. They begin with the "@" symbol. This is followed by a function name (such as "sum" or "avg") which lets your computer know what type of function it is expected to do. Although there are a few special cases, most @ functions are usually concluded with an argument. The @ functions which do not require an argument are described as such and listed along with the others at the end of this chapter.

An argument is a set of values which are operated on by the function. The values you use in an argument can be typed in (free-standing) or cell references. @ function arguments can consist of single values, a cell range or set of cell ranges. Where they are used, ranges can be referred to by name or through cell addresses. To find out more about naming ranges, see the chapter, "Range Commands". Depending on the nature of the operation, some @ functions only accept numbers and will not accept ranges.

As with other formulas, space characters may not be inserted in an @ function. Uppercase and lowercase letters are considered alike when you type in the function name.

@ functions can be used by themselves or as part of a larger formula. Usually, they can be used wherever you need a number for cell entry.

@ function used alone: @sum(A12..A15)

@ function used in a formula: 3+@sum(A12..A15)

@ functions can even be used as parts of other @ functions when they are set off by parentheses. Extremely complex formulas can be constructed with @ functions. Should you ever write a formula that is too complex for your computer to process, it is possible to break down the formula into two or more parts, enter them into different cells, and use those cell references to form a simple formula.

Example: In cell A1, put: +A7+@COUNT(A8..A19)
In cell A2, put: +2+3-1+@COUNT(B8..B19)
In cell A3, put: +A1+A2

@ Function Types

As we mentioned earlier, there are several different types of @ functions. We have grouped the @ functions in the order of their various types for further discussion. The groups are: financial, logical, mathematical, statistical, data, special and date functions. Database functions are excluded from further discussion here because they are discussed in the "Data Commands" chapter. However, all other @ functions will be listed here, although for in-depth information on these functions, we suggest you turn to one of the books listed in Appendix B.

FINANCIAL FUNCTIONS

The financial functions are used to find values of calculations which are purely financial in nature. For example, you would use these functions to find the future value of an annuity or to find the present value of an ordinary annuity.

@IRR (best possible guess, cash payment series):

The Internal Rate of Return function finds the (approximate) internal rate of return for a series of cash payments made at set intervals. This function requires a value which represents your best possible guess at the right answer. It also requires a series of cash flows (one negative and the rest positive). No blank cells should be included in the series. Should there be any period when no cash payment was made, place a zero in its cell.

This function uses an iterative scheme to find the correct answer. If a convergence to within .0000001 doesn't occur in 20 iterations, the result of the value is "ERR". At times, depending on what best possible guess you first make, the result of the function may vary when you use the same cash payment series. Usually, if a guess is between 0.0 and 1.0, it will yield an accurate result.

Example:

	(A)	(B)	(C)	(D)	(E)	(F)
(1)	Pmt.	-2500	1250	1000	500	250
(2)	Guess	0.12				

@IRR(B2,B1,F1)=0.102212

@NPV (initial payment, interest rate, series of future cash flows):

The Net Present Value function is used to find the net present value of a series of future cash flows. The initial payment is a single value. It is entered as a positive value. The interest rate is also a single value. It is a percentage which represents the rate of interest for each period. The series of future cash flows is a range representing receipts or payments stemming from the initial value. The range which represents the series of future cash flows must be a single column or row. Blank cells should not be used, but zeros may represent areas of non-receipt.

The actual result of the function includes the initial payment. To find the overall net present value, subtract the initial payment from the result.

Example:

	(A)	(B)	(C)	(D)	(E)
(1)	Initial	1000		Rate	11%
(2)					
(3)	Series	500	500	500	500

+B1+@NPV(E1,B3.E3)=2551.222

@FV (payment, interest, terms):
The Future Value function is used to find the future value of an annuity. For this you need to specify a monthly payment value, an interest rate (per period) and a number of payment periods. You may use numbers or cell references as values.

Example: If Payment=1200, Interest=6% and Terms=12, then
@FV(1200,.06,12)=20243.92

@PV (payment, interest, terms):
The Present Value function is used to find the present value of an ordinary annuity. It needs a payment, an interest rate (per period) and a number of payment periods. You may use numbers or cell references for values.

Example: If Payment=1200, Interest=6% and Terms=12, then
@PV(1200,.06,12)=10260.61

@PMT (principal, interest, terms):
The Payment function is used to calculate mortgage payments based on principal, interest rate per period and the number of periods. Even if you use zero as an interest rate, the function will yield correct results. You may use numbers or cell references for values.

Example: If Payment=1000, Interest=6% and Terms=12, then
@PMT(1000,.06,12)=119.2770

LOGICAL FUNCTIONS

The logical functions are very like the logical operators discussed earlier. Logical functions are used to test other values and formulas or just to represent the values of true or false. @True and @False do not take arguments.

@FALSE:
The False function represents the value of 0 (false).

Example: @FALSE=0

Therefore: @FALSE*8=0

@TRUE:
The True function represents the value of 1 (true).

Example: @TRUE=1

Therefore @TRUE+(5*2)=11

@ISNA (value):
This function represents the value of 1 (true) if the specified value has the value NA (not available). If not, it has the value of 0 (false).

Example: If cell A2 has the value NA, then @ISNA(A2)=1

@ISERR (value):
This function represents the value of 1 (true) if the specified value has the value ERR (that is, if the value has an undefineable result). If not, it has the value of 0 (false).

Example: If the value of cell A5 is 5, then @ISERR(A5)=0

@IF (condition, first value, second value):
This function is used to first test the condition. It then uses the first value if the condition is true. It uses the second value if the condition is false.

Example: If the value of cell B2 equals 7 and the value of cell B3 equals 8, then @IF(B2>B3,2,5)=5

MATHEMATICAL FUNCTIONS

The mathematical functions cover many different areas of pure mathematics, including many trigonometrical and algebraic expressions. We have listed the trigonometrical functions first. Of these functions, @PI and @RAND do not require arguments.

@ACOS (cosine of the angle in radians):
This function calculates the arc cosine from the cosine of an angle in radians. The cosine value must be between -1 and +1. It can be entered as a number or a cell reference. The result of the function is always between 0 and Pi. If not, it is indicated by the value "ERR".

Example: @ACOS(.3)=1.266103

@ASIN (the sine of the angle in radians):
This function calculates the arc sine from the sine of an angle in radians. The sine value must be between -1 and +1. It can be entered as a number or a cell reference. The function's result is always between -Pi/2 and +Pi/2. If not, it is indicated by the value "ERR".

Example: @ASIN(.5)=0.523598

@ATAN (tangent of the angle in radians):
This function calculates the arc tangent from the tangent of an angle in radians. The function's result will always be between -Pi/2 and + Pi/2.

Example: @ATAN(1)=.785398

@ATAN2 (first value, second value):
This function calculates the arc tangent from the tangent of an angle in radians. The tangent is represented as y/x. If the first value equals zero and the second value equals zero, the result is displayed as "ERR". It is entered differently than @TAN (second value/first value) because it considers the signs of the first value and the second value to have separate values for all four quadrants, from -Pi to +Pi.

Example: @ATAN2(.5,1)=1.107148

@COS (angle in radians):
This function calculates the cosine of an angle in radians.

Example: @COS(.5)=.877582

@PI:
It is frequently used to convert degrees to radians. One degree equals @PI/180 (radians). This function does not require an argument.

Example: 20*(@PI/2)=31.41592

@SIN (angle in radians):
This function calculates the sine of an angle in radians.

Example: @SIN(1.5)=.997494

@TAN (angle in radians):
This function calculates the tangent of an angle in radians. The value "ERR" is displayed if Angle-In-Radians=Pi/2+Pi*n (n being any integer).

Example: @TAN(1.5)=14.10141

@ABS (value):
This function calculates the absolute value of a number.

Example: If the formula in cell A1 reads 6-8, then @ABS(A1)=2

@EXP (value):
This function calculates a value raised to the exponential power. If the value is greater than 230, the result is displayed as "ERR".

Example: @EXP(10)=22026.46

@INT (value):
This function finds the integer part of a value.

Example: If the formula in cell A1 reads 3-.6, then @INT(A1)=2

@LN (value):
This function calculates the natural logarithm (or base e of the value's logarithm) of the value. The result is displayed as "ERR" if the value equals zero or is a negative.

Example: @LN(10)=2.302585

@LOG (value):
This function calculates the base 10 logarithm of the value. The result "ERR" is displayed if the value is zero or a negative.

Example: @LOG(5)=.698970

@MOD (first value, second value):
This function finds the value of the remainder from the first value after it has been divided by the second value.

Example: @MOD(30,4)=2

@RAND:
This function is used to find a random number which is distributed uniformly between 0.0 and 1.0. It doesn't use an argument.

Example: @RAND=.414100 *or* @RAND=.690568

@ROUND (value, no. of decimal places):
This function is used to round off a value to a specified number of decimal places.

Example: If the formula in cell F2 reads 2.34*2.456, then @ROUND(F2,2)=5.75

@SQRT (value):
This function calculates the square root of a value. If the value is negative, the result of this function is displayed as "ERR".

Example: @SQRT(169)=13

STATISTICAL FUNCTIONS

The statistical functions are very similar to the data functions (discussed in the chapter, "Data Commands"), the difference being that data functions are used on a distinct section of a database (and begin with a D in the function name) while statistical functions require a list of values to work with. The list specified can be a range.

@COUNT (list):
This function counts all the items in a list and uses that number as its value. If the list consists of one cell, the result of the function will always be "1" even if the cell is blank. In all other cases, blank cells are not counted.

Example: @COUNT(2,4,6,8)=4

@SUM (list):
This function adds all the cell values of the list. If the list is a range, blank cells are ignored.

Example: @SUM(2,4,6,8)=20

@AVG (list):
This function averages all the values of the list. If the list is a range which contains empty cells, they are ignored.

Example: @AVG(2,4,6,8)=5

@MIN (list):
This function finds the minimum value of the list. If the list is a range, empty cells are ignored.

Example: @MIN(2,4,6,8)=2

@MAX (list):
This function finds the maximum value of the list. If the list is a range, empty cells are ignored.

Example: @MAX(2,4,6,8)=8

SPECIAL FUNCTIONS

Special functions do not relate to any particular subject. Instead, they are a special set of functions which help you define or find values on your worksheet. You have already been introduced to two of them: @NA and @ERR.

@NA:
This function indicates that a value is not available. The result is displayed as "NA".

Example: @IF(3>2,@NA,3)=@NA

@ERR:
This function indicates that a value cannot be defined. The result is displayed as "ERR".

Example: @IF(3<2,3,@ERR)=@ERR

@CHOOSE (x, set of values):
This function is used to test logical expressions or to look up short tables. The first value of the argument (x) is converted to an integer. The rest of the argument is a list of optimal values. This first value of the argument must be greater than or equal to 0 and less than the largest of the values in the list. If not, the value of this function is displayed as "ERR". Otherwise, the result is a value from the list of values whose order corresponds with that of the integer plus one.

Example: @CHOOSE(3,2,2.5,4,6,8)=6

@HLOOKUP (x, range, offset):
This function looks up a table horizontally if "x", the test value, is in the first row of the range. X specifies the column in which the result can be found. The range you specify consists of the area which is to be searched (usually the entire table). In the first row of the range, values cannot be duplicated and must be in ascending order. If the first value exceeds x, then the result is displayed as "ERR". For any other value of the row which exceeds x, the result is the value of the cell below the previous value in the row. The offset determines how many rows below the first one in the range it should look to find the result of the function.

Example:

	(A)	(B)	(C)	(D)
(1)	1	2	3	4
(2)	5	10	15	20
(3)	2.5	4.5	6.5	8.5

@HLOOKUP(3,A1.D3,1)=15

@VLOOKUP (x, range, offset):
This function is similar to the one described above, except that the look-up is done on a vertical basis, so the range is based on the first column.

Example:

	(A)	(B)	(C)
(1)	1	5	2.5
(2)	2	10	4.5
(3)	3	15	6.5
(4)	4	20	8.5

@VLOOKUP(2,A1.C4,1)=10

DATE FUNCTIONS

VIP Professional provides a sophisticated, yet easy-to-use method for including dates in calculations and for creating calendars. The trick to it is the conversion of calendar dates (from January 1, 1900 to December 31, 2099) into numbers starting at 1, and increasing by one for every day since. This takes into consideration the February months and leap years. Every date has a specific number that can be attached to it, such as the number 36526 for January 1, 2000. Once you have the dates numbered, you can add a month or a year by adding 30 or 365 to the number for the date, as well as performing many other calculations.

Obviously, to do this easily, you need functions to find the numbers (or serial dates). You will also need functions to turn these numbers back into calendar dates. These functions are provided by the date @ functions and by the Worksheet and Range Date Format commands.

The first two functions listed below allow you to change today's date or another, specified date into its serial version so it can be used in calculations. A Date Format command can be used to convert the calculation's result back into calendar format.

@DATE (year, month, day):
This function calculates the serial number of a date. The year used must be between 1900 and 2099. When you use a date as an argument, enter it in parentheses and numerically: Year-Month-Day. Years are numbered from 0-199 and start at 1900. For example, you might use "@DATE(83,4,12)" to change the calendar date April 4, 1983, into its serial number. If you enter it in the wrong order, VIP will still evaluate it. If it is an impossible date, VIP Professional displays "ERR" in the cell. By an impossible date, we mean one which has too many months in the month's places or too many days for the specified month. For example, the dates entered as "(85,14,12)" and "(85,2,30)" are impossible: There are not 14 monthes in a year, nor are there 30 days in February.

Example: @DATE(85,9,24)=31314

@TODAY:
This function is used to change today's date to its serial date (up to December 31, 2099). This command is only effective if you have set the date using the Control Panel in the Desk Menu.

Example: If you entered today's date as Sept. 24, 1985 in the computer, then @TODAY=31314

The following three date @ functions convert a serial number into the actual day, month or year, in numbers. These functions are useful for finding out where you are in a series.

@DAY (date):
This function finds the day of a month given the serial date (which is used between January 1, 1900 and December 31, 2099).

Example: @DAY(31314)=24

@MONTH (date):
This function is used to find the month number from a given serial date (from January 1, 1900 to December 31, 2099).

Example: @MONTH(31314)=9

@YEAR (date):
This function is used to find the year number from a given serial date (from January 1, 1900 to December 31, 2099).

Example: @YEAR(31314)=85

Using Date @ Functions To Calculate Dates

As was said above, date @ functions let us work easily with dates in calculations. With date arithmetic, we can take calendar dates translated to their serial dates with the @DATE or @TODAY function, and add days, months or years to create time periods for whatever purpose. We can also create complex formulas with logical expressions for special calculations.

The way the calculation results are changed back into calendar dates is through the date format commands in the Worksheet and Range menus. The date format commands take a number and change it into the corresponding calendar date, with three optional displays: Day-Month-Year (i.e. 07-MAR-85), Day-Month (i.e. 07-MAR) and Month-Year (i.e. MAR-85).

For example, the date, March 28, 1985, is displayed as 31134 when entered in a cell with the date function @DATE(85,3,28). This number can be changed back into the display of a calendar date 28-MAR-85 by selecting the Date option (Day-Month-Year) of the Range Format command for that cell.

Example: Starting from the date, September 24, 1985, if you want to find out if 61 days (or two months) later is November 24, 1985:

1. First make sure an empty cell has a date format (if not, use the Range Format command, Option 1) and that its column width is wide enough to display the result of the function (if not, use the Worksheet Column-Width Set command and set it to 12 spaces).

2. Enter the formula:
   @IF((@DATE(85,9,24)+61=@DATE(85,11,24)),@DATE(85,11,24),@ERR).
   Press [Return].

3. If the date 61 days later is November 24, 1985, then that date will be displayed in the previously empty cell. If it is not, "ERR" will be displayed instead.

A good example of the usefulness of date arithmetic is the creation of a column of months in the year for expenses, such as that created in the tutorial section of this Handbook. Instead of the painstaking entry of labels for all the months, we could have used date arithmetic to increment the last date by 30 days to go through the sequence of months from January through December. The first step would be to use the @DATE function in cell A4 to find the serial number for a day in January of 1985, say January 6: @DATE(85,1,6). The next step would be to go to cell A5 and enter the formula +A4+30 to add 30 days to the previous month. (30 days is considered a banker's month.) Next, we would copy the contents of cell A5 from A6 to A15. This serves to add 30 days to the date of the previous cell. The final step would be to format the cells from A4 through A15 with the Range Format Date Month-Year command. Now you would have a nice succession of the months:

A6: (D3) @DATE(85,1,6) READY

		Household Budget for 1985			
	Mortgage	Car Payments	Education	Food	Insurance
Jan-85	$500.00	$200.80	$300.00	$250.00	$150.00
Feb-85	$502.50	$201.00	$301.50	$251.25	$150.75
Mar-85	$505.01	$202.00	$303.01	$252.51	$151.50
Apr-85	$507.54	$203.02	$304.52	$253.77	$152.26
May-85	$510.08	$204.03	$306.05	$255.04	$153.02
Jun-85	$512.63	$205.05	$307.58	$256.31	$153.79
Jul-85	$515.19	$206.08	$309.11	$257.59	$154.56
Aug-85	$517.76	$207.11	$310.66	$258.88	$155.33
Sep-85	$520.35	$208.14	$312.21	$260.18	$156.11
Oct-85	$522.96	$209.18	$313.77	$261.48	$156.89
Nov-85	$525.57	$210.23	$315.34	$262.79	$157.67
Dec-85	$528.20	$211.28	$316.92	$264.10	$158.46

Using Date Arithmetic to Create a Monthly Breakdown

Keyboard Macros

Introduction

VIP Professional has a special facility called keyboard macros which allows you to use a stored sequence of key strokes attached to a letter. Instead of typing a series of keystrokes over and over again, you can simply type the series once, attach it to a letter, and type the letter whenever you need to use the series. Keyboard macros are used anywhere a repetitious series of keystrokes are needed. Keyboard macros are used for such diverse matters as formatting text, entering values or directing movement and position of entries in the worksheet.

Keyboard macros, called macros for short, can be quite simple or very complex. However, even in its simplest form, a macro is versatile enough to allow you to make choices governing several aspects of its production. At the other end of the spectrum are extremely sophisticated and powerful macros which are responsible for specialized applications.

In fact, the macro facility created by Lotus 1-2-3 has developed into quite a mini-industry of application programs which will turn VIP Professional, or 1-2-3, into a dedicated program for specific purposes such as accounting. These applications are on sale at major computer stores. Ask your dealer which will work with VIP Professional. We encourage you to investigate these applications to see if any would be suitable for you. There are also books devoted to the creation of specialized macros. You may consult Appendix B for applicable books which you can buy at your local book store.

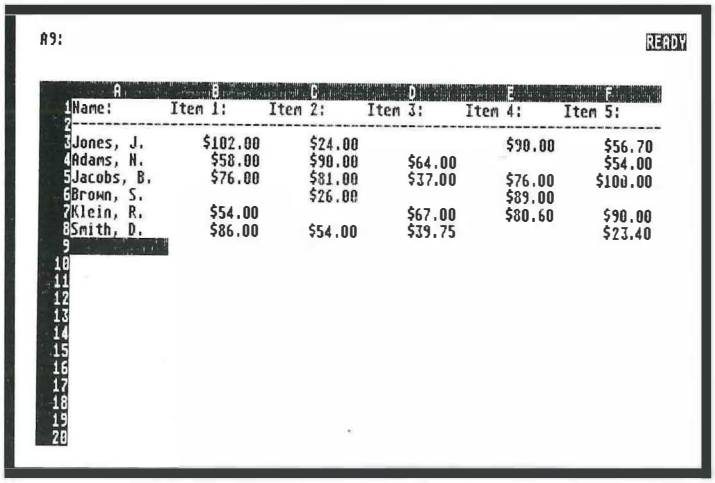
As you learn to use macros and become skilled in their construction, you will become familiar with the more advanced uses of keyboard macros and the concepts backing them. Interactive macros and the macro commands (the "/X" commands) are two of the most sophisticated forms of macro usage.

We will begin this chapter with instructions and examples of simple macros and the options available in their production. From this point, we will go on to discussing the more advanced topics involving keyboard macros.

Creating a Simple Macro

Learning how to create simple keyboard macros is best done through example so we will begin by taking you through the steps for producing and using a keyboard macro. For our example, we will create a macro which is in the form of a label. This label will be used in cells of varying distance around your worksheet.

The worksheet we will be using is a fictional example which summarizes the total value of products (of which there are five types) sold by six different salesmen in one month. It includes the monthly totals for each type of product. During this month, certain products were not stocked and, therefore, unavailable to some of the salesmen. To reflect this, we will use a macro to put the label, "No Stock" in the pertinent fields.



The Sample Worksheet

Now that you have decided what the macro will consist of (the label "No Stock"), you will have to find some place on your worksheet to construct it. Find a cell in an empty area of your worksheet. Enter the sequence of keystrokes "No Stock~" in label format into the empty cell. We will describe the purpose of the "~" later in this chapter, but for now it is only important to know that the "~" is needed to set the label in its cell.

A label format is used in the construction of all keyboard macros. Even if the key strokes of the sequence are commands or formulas, the sequence must be defined as a label. Because you are defining the sequence as a label, you may use any of the three label-prefixes. These three are: ' for left aligned labels, " for right aligned labels, and ^ for centered labels. In most cases, you will probably find it simplest to use the ' label-prefix. A general rule about macros is that what appears in the label is what is used as the keyboard macro. However, these label-prefixes are ignored when macros are used. When text is used as a macro in the Ready mode, VIP Professional will recognize it as a label and assign it the Worksheet Global Label-Prefix or the Range Label-Prefix setting, depending on which controls the cell.

To make a label-prefix count—that is, to make a label-prefix align text to the right or be centered—you must begin the sequence with two label-prefixes. The first label prefix is

necessary for the production of a macro, but is later ignored. The second label-prefix acts as an ordinary label-prefix when the macro is run.

Although the macro we are constructing in our example is very simple and uses only one cell for its construction, macro sequences can be constructed in more than one cell. These are called multiple-cell macros and we will discuss them further later in the chapter. Such macros must be created as a range of cells in a column. Each and every cell used in the construction of a macro sequence must include a label-prefix character.

The next step of the example is to attach the contents of the cell to one of the letter keys. To do this, you will use the Range Name Create command. First select Range Name Create (/RNC). In response to the prompt for a range name, enter the letter you wish to use preceded by the backslash character. For instance, when you use the letter "D", type it in as "\D" and press [Return] to enter it. The letter may be typed in upper- or lowercase. Both are considered alike by VIP Professional in this case. In response to a second prompt requesting a range, specify the address of the cell which contains the macro sequence, or the first cell of the range if the macro is more than one cell. You may type in the cell address or point to it using your mouse or arrow keys. Press [Return] to enter it. The macro sequence is now attached to the letter "D".

The final step is using the keyboard macro. Move to the first cell in which you wish to use the macro. Type "[Alternate][D]". VIP Professional types the key stroke sequence attached to the letter "D" ("No Stock"). To use it again, simply move the cell indicator over the next cell in which you wish to use the macro and repeat the process.

If you should ever attempt to use an incorrect macro name, the computer will beep at you and send you an error message.

Keyboard macros are usually invoked (or used) in the Ready mode. They are begun in the cells where the cell indicator is currently residing. Macros used in the Ready mode consist of value or label entries and/or one or more complete commands.

Macros can also be used in response to prompts when issuing commands. For example, a textual macro sequence can be used as a title in response to a prompt of a Graph Name command. It can also be used as a footer in a Print Options Footer command.

Revising Macros

VIP Professional recognizes a macro sequence by its range name rather than by its contents. It is fairly easy to reenter the cell in which the macro was constructed and make any editing changes necessary. Macro ranges are edited in the same way that all other worksheet cells are edited. When you reenter a cell, whether it is a macro label or any other unprotected cell, you may choose to be placed in the Edit mode and use the functions available for editing. If you delete keystrokes, make sure you delete all characters of that

keystroke. Otherwise, you may end up with a garbled macro. For example, if you used the keystroke, "{Down}", make sure all the letters and the braces are erased.

Representing Characters Other Than Numbers and Letters in Macros

Besides numbers and labels, macro sequences can also use commands, formulas or any one of the ten special function key combinations. Almost anything that can be reached from the keyboard is fair game for macros!

Commands are entered in a manner similar to the way they are entered when typed. For example, if you wished to use the format command, Worksheet Column-width Set, to set a column's width to 11 characters, you would type "/wcs11~". Formulas are entered as part of the macro sequence in the form they usually use.

To represent keys of more than one character, arrow keys, and the special function key combinations in a macro sequence, type its name surrounded by braces. For example the left arrow key is indicated in this fashion, "{Left}". It doesn't matter if you use upper- or lowercase letters. VIP Professional considers both to be the same. When writing macro sequences, never use brace characters for anything other than enclosing the names of these particular keys and key combinations. The chart below lists the key names and functions.

Key	Function
{Up}	Up Arrow Key
{Down}	Down Arrow Key
{Right}	Right Arrow Key
{Left}	Left Arrow Key
{Home}	Home
{End}	End
{PgUp}	Screen one Page Up
{PgDn}	Screen one Page Down
{Delete}	Delete Key
{Esc}	Escape Key
{Bs}	Backspace one Character
{Edit}	Edit Function
{Name}	Name Function
{Abs}	Absolute Function
{GoTo}	Express Function
{Window}	Window Function
{Query}	Query Function
{Table}	Table Function
{Calc}	Calculation Function
{Graph}	Graph Function
{?}	Pauses for input until you press [Return]

This list is self-explanatory and describes functions you have already been using, except for the last item which we have not yet discussed. If you use "{?}" in a macro sequence, VIP Professional will pause at this item when it repeats the macro sequence. You may manually include any information you want during the pause. Then, press [Return] to finish the keyboard macro.

Whenever VIP Professional pauses during a macro operation, the letters "CMD" appear before the mode indicator. So, when you use a question mark set off by braces in the macro, "CMD" will be displayed when the macro is running and the question mark has been reached. Once you press [Return], "CMD" is erased and running of the macro is resumed.

Using [Return] in Macros

Although we could have included the symbol for [Return] in the chart above, we did not because it doesn't use braces around its name like the other functions do. It also has some interesting and useful properties which we will discuss in this section.

The [Return] key is symbolized by the tilde character, [~], when it is used in a macro sequence. If a tilde is present in a macro sequence, it means that [Return] will be substituted in the actual running of the macro. Of course, the [Return] key itself (along with clicking the mouse button and the movement facilities) is still be used to finish off and enter a macro sequence when it has been constructed in the worksheet cells.

[~] is generally used in the midst of a macro sequence to complete a command or to enter data in a cell. The tilde may be followed by a new command or data entry. For example, [Right] may be used once after [~] to indicate that the following group of information should be placed one cell to the right of the first one. The [~] may also be used at the end of the X-command macro sequences.

Example: '/wcs12~"Name~{Right}/wcs25~^Address~
(This will set the starting column width to 12 spaces and align the label, "Name" to the right of the cell. Then it will move to the cell to the right, set column width to 25, and center the label, "Address" in the cell.)

Using a tilde at the end of a macro sequence is the same as pressing [Return] after typing in a value or a label. [Return] "sets" an entry and leaves you free to move on to another cell. If you do not use a tilde, you will remain in the cell of the macro. You may press [Return] or type in additional information. As an alternative, you can even include another macro.

Example: You may use a macro like this: 'Label~.
Or, you may use a macro like this: 'Label. Then, press [Return] to end it after it has been run.

In addition to [Return] or [~], you will notice that the movement keys have preserved their ability to set entries. For example, if you use "{Right}" in a macro sequence, it will set the preceding section (a label or a value) in a cell before moving one cell to the right.

Single-step Mode

VIP Professional has a special facility called the Single-step mode. This facility slows down the running of your macro to one keystroke or /X command at a time. The principal use for this facility is testing the design of your macro. By checking each step, you may find where the flaws (if any) exist. Then, you can correct them.

To use the Single-step mode, press [Alternate] and [Function 1]. A Step icon will appear in the lower section of the screen. To stop using the Single-step mode, press [Alternate] [Function 1] again. This will also stop the running of your macro, although it doesn't erase it.

While you are in the Single-step mode, your macro will only be executed one step at a time. To advance one step in the running of the macro, press any key on your keyboard. After it finishes one keystroke, function or /X command, the macro pauses. You may examine the results of that step. Then, press any key to go to the next step.

Multiple-cell Macros

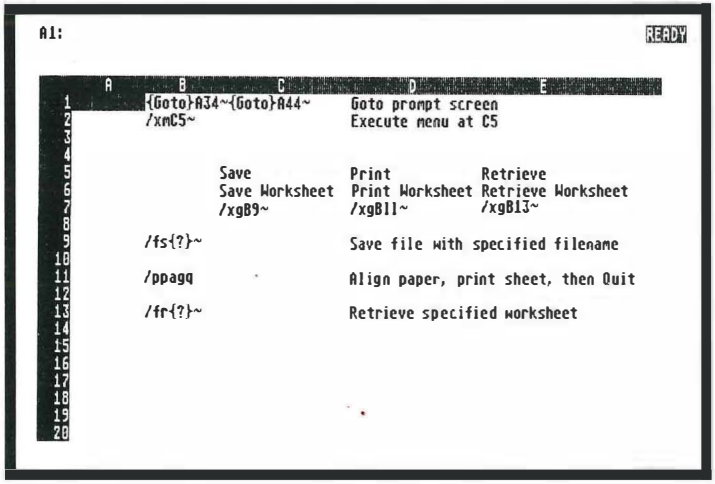
Some longer macro sequences use many keystrokes. Instead of attempting to crowd them all into one label or being forced to create a series of macros to meet your needs, VIP Professional allows you to create a macro sequence using more than one cell. Each cell must sequentially follow the previous one in the same column; each cell must also use a label-prefix character.

You may enter as many keystrokes as you deem feasible in each cell. When VIP Professional uses a macro, it reads its sequence in the order of the first cell from left to right, then the second cell from left to right and so on down the column. It stops reading at the first non-label cell in the column. There are two commands which modify the order in which a macro sequence is read and used: /XG and /XC. These advanced commands are discussed later in the chapter.

We suggest that you keep macro sequences manageable by dividing them into sections of not more than 20 or 30 characters per cell. A sequence can be divided at any point between key strokes. It makes no difference to VIP Professional where the division occurs.

Commenting

VIP Professional reads a sequence columnwise. If you have a column of empty cells to the right or to the left of a macro sequence, you can use this space to make notes (in the form of explanatory labels) for your personal use. These notes let you know exactly what it is you are trying to accomplish with each step of a macro sequence. This is called "commenting".



Commenting

Auto-execute Macros

Most of the time, you will be assigning letters to macro sequences. There are special cases when you will want to assign the character "0" (zero) to a macro sequence (range name \0). This creates an "auto-execute" macro. Macros using the range name "0" are automatically invoked whenever you reload the worksheet using the File Retrieve command.

Macros assigned to "0" (zero) may not be executed using [Alt] 0. If you wish to use this macro other than when the program is loaded, you must give it another name.

/X Commands

VIP Professional has a set of eight special commands which are effective only when used in a macro. These commands transform macros from simply being repetitious, predetermined sequences of keystrokes to a decision-making process which can even decide

the sequences of key strokes. Each one of the commands affects the way in which VIP Professional reads the keystrokes. These commands are called /X commands. The chart below lists all eight and their functions.

COMMAND	FUNCTION
/XI(Condition)~	Uses if-then condition
/XG(Location)~	Goes to a location
/XC(Location)~	Goes to a location (calls a subroutine)
/XR	Returns (from subroutine)
/XQ	Quits macro execution
/XM(Location)~	Displays and processes a user-defined menu
/XL(Message)~(Location)~	See /XN
/XN(Message)~(Location)~	Displays a message in the control panel, accepts a label entry (/XL) or number entry (/XN) from the keyboard, and places this entry in a cell.

The /X commands are extensive and powerful. Using them may involve making several decisions governing their actions. If you do not make these decisions, VIP Professional will make the decisions for you. It is possible that a decision will be made that you didn't anticipate or intend. We suggest that you make as many decisions as possible concerning the macro and its environment. We also suggest that you test your macro carefully using the Single-step mode.

To use an /X command, it must be constructed as part of a macro sequence. Each /X command uses the cells of the worksheet as variables (that is, they use information from the worksheet for their operations). Six of the eight /X commands require a condition, location, message or a combination of them, each of which is followed by the ~ symbol. The other two /X commands are used by themselves.

/XI(condition)~

The /XI command is an "if-then" conditional command. The condition is considered true if it has a non-zero value. If its value is zero, it is considered false. When the condition holds true, VIP Professional continues reading keystrokes in the same cell. If the condition is false, VIP Professional moves to the next cell.

/XG(location)~

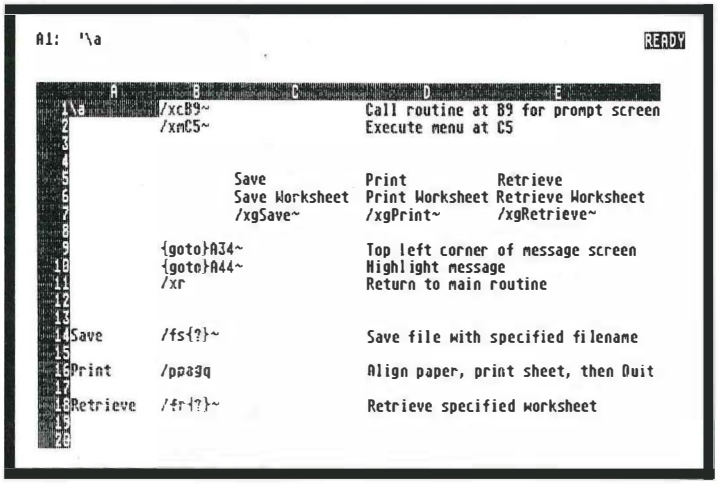
The /XG command is the macro version of the GoTo command. It is used to direct the macro to go to a new location and continue execution there. You may invoke this command in any cell of the worksheet. If it is not in the cell specified as the location, VIP Professional will move to the one specified. After finding a specified location (which may

be a cell address, a range or a range name) with this command, VIP Professional will continue reading keystrokes from that location. If you had specified a range or a range name instead of a cell, VIP Professional begins in the upper left corner of it.

/XC(location)~

The /XC command is the Call Subroutine command. This command is similar to the /XG command discussed above since it continues reading the keystrokes of the macro at the location you specify. Like the /XG command, the location may be specified as a cell address, a range or a range name.

The /XC command differs from the /XG command because it can use the /XR command to repeat or "nest" the sequence of key strokes which are sandwiched between itself and the /XR command. This sandwiching cannot be done without also using the /XC command.



Using the /XC Command with the /XR Command

/XR

The /XR command is the Return from Subroutine command. It is always used in conjunction with and after the /XC command. If no /XC command has been included in the macro and a /XR command is, then the computer will beep in error when the macro sequence is being read.

Otherwise, the /XR command rereads the sequence of keystrokes starting after the /XC command. This repetition, or nesting series, can be done up to 16 levels (or times) per macro.

/XQ

The /XQ command is the Quit command. When the CMD indicator is displayed in the upper right corner of the screen, this command causes VIP Professional to erase the indicator and return you to the worksheet in the Ready mode. The /XQ command is usually issued after the macro has been invoked rather than being part of the macro sequence like the other /X commands are.

/XM(location)~

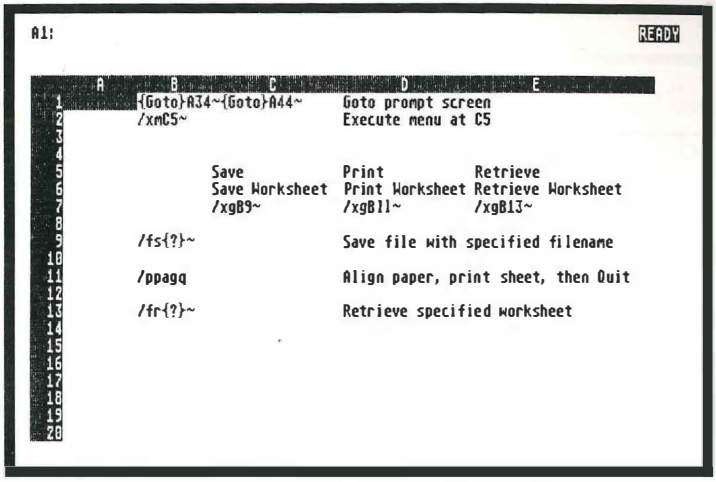
The /XM command is used to make a choice from a preconstructed menu. This menu is constructed by yourself before you construct the macro sequence. The location required in the macro sequence is the location of the menu in the worksheet. The location may be specified as a cell address, range, or range name. The specified location is considered to be the top left cell of the menu range or the entire range (depending on whether you've specified a single cell or a range). A menu range can be up to eight columns wide and is at least two rows deep.

The menu range contains the menu you have constructed. Each range is at least two rows deep. The first row is used to enter up to eight different choices, using any text you want. We suggest that the text be kept as short as possible to avoid overflowing other worksheet cells. Each choice is placed in its own column (or cell). There should be no empty cells between the menu items. The cell following that of the furthest right menu item should be empty. When reading keyboard command input, VIP Professional reads the choices from left to right and stops at the first empty cell or the eighth choice (whichever comes first). Remember that when you choose one of the items you will often indicate it by its first letter, so it is unwise to use menu choices with the same first letter. If you do have two or more menu choices which begin with the same letter, VIP Professional uses the first choice it comes to. Upper- and lowercase letters are considered alike.

The second row of the menu range is reserved for an explanatory phrase for each of the menu choices of the row above. This explanatory phrase explains the command in abbreviated form. It may list the actual steps needed to take the action described by the menu choice. Only forty characters of these phrases will be displayed on the screen.

Below the second line, that is, below the explanatory phrase for each command, is a macro to execute whatever you have assigned to the command. After all, without this, what good would the user-definable menus be? These macros are created just like any other macros.

After the /XM command is used, VIP Professional will continue reading the key strokes of the cell in the third row. If necessary they can continue columnwise in the cells below that first one. If that first cell is empty, VIP Professional considers the macro sequence to be completed.



A User-Defined Menu Using /XM

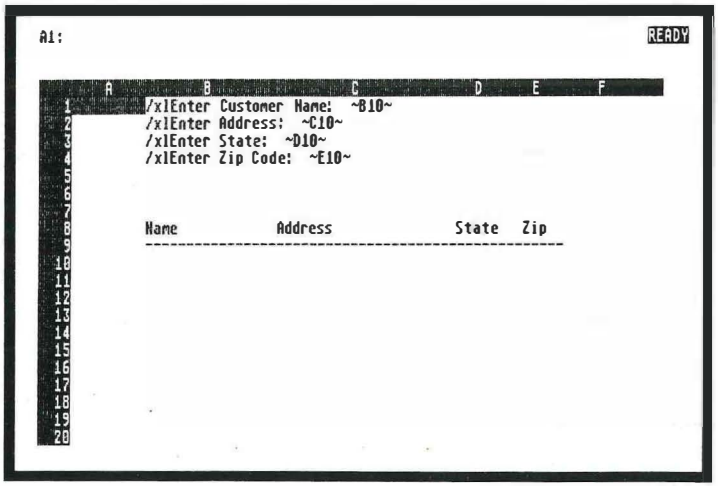
The /XM command is ready to be used in a macro sequence now. When the macro is invoked, VIP Professional will pause at the /XM command and move to the location you specified as its range. The menu appears just like other menus—at the top of the screen. The second line of the control panel is used for the explanatory phrases of each menu choice. You may choose one of the items just like any other menu command. Your choice will be carried out. If you make a wrong choice and press [Escape] to move back one step as you would with the regular VIP Professional menus, you will find that VIP Professional simply continues reading the key strokes of the rest of the macro sequence instead and ignores the Escape.

/XL(message)~(location)~

The /XL command is used to enter labels in specified locations. When the /XL command is used, VIP Professional first moves you to the specified location. In the macro sequence, you may specify the location as a cell address, a range or a range name. If you have specified a range or a range name, VIP Professional will only use the top left cell of the range as its location. The message which is included in the macro sequence can be up to 39 characters long. When you arrive at the specified location, VIP Professional displays the message on line 2 of the control panel. You can add to this message by typing up to 240

additional characters. Then enter the message by pressing [Return]. All labels entered using this command will be labels and will left- aligned in the cells.

VIP Professional will not recalculate your worksheet for you automatically after you have used this command. If you wish recalculation to occur, you may decide to include calculation steps later in the macro sequence.



Using /XL

/XN(message)~(location)~

The /XN command is very similar to the /XL command. The major difference is that it uses values rather than text. It is not a label. In fact, if you should use or type in an entry which cannot be interpreted as a numeric value, VIP Professional beeps and sends you an error message. You must press [Return] or [Escape] before you can reenter characters in the correct fashion. The entry may consist of numbers or formulas. @ functions and range names in formulas are acceptable.

When you use this command in a macro sequence, VIP Professional moves to the specified location, displays the message in the control panel (up to 39 characters) and waits for you to add any number or formula you wish. After pressing [Return], VIP Professional will calculate the numeric value of the entire entry and enter the value at the specified location. However, the program does not recalculate the entire worksheet; you must include {Calc} steps to force recalculation if you need it.

Introducing Menus

& the Copy, Move & Quit Commands

Using Menus to Select Commands

Many VIP Professional commands can be reached through menus. Menus are lists of choices which pertain to one subject. The lists are called menus because of their similarities to the menus you use in restaurants. The choices listed on a menu are called items or commands.

The commands of VIP are structured in layers, with subsidiary menus stemming from one dominant menu. From these subsidiary menus stem other menus, and so on. One good way to look at the command structure of VIP is to think of it as a tree. The main menu items are like branches, their submenus are like twigs, and the sub-submenus are like leaves.

You use this menu structure when you issue commands. For example, to choose the Graph Options Color command, you must type /GOC if you are in the main menu. This moves you from the main menu to the Graph menu (/G), then from the Graph menu to the Options menu (O) and finally specifies the Color command (C). If you are already in the Graph menu or in the Options menu, you don't move through those menus to get to the command. Typing OC (if you are in the Graph menu) or C (if you are in the Options menu) is sufficient.

The same concept holds true with the modes you use. If you are working from the keyboard, you do not press [/] unless you are in the Ready mode. When you are already in the Menu mode and press [/], your computer will beep at you. Of course, this does not apply when you are using a mouse because the Professional automatically moves you from the Ready to the Menu mode and you don't need to press [/].

The layering of menus is most pronounced when you use your mouse or arrow keys to choose items. Only one menu at a time is displayed on the menu line. By highlighting one command from the menu, you can bring up its subsidiary menu (or drop-down menu), choose a command from it to bring up its submenu and so on until you finish the command series.

The main (starting) menu has eleven choices. The first two items are Desk and VIP. The Desk menu offers choices pertaining to your computer hardware such as setting printer configurations. The VIP menu has a subcommand called "Goodies" which allows you to choose fonts or turn the grid pattern of the worksheet display on or off. The VIP menu also offers menu alternatives to the ten special functions.

Another three menu choices you have are the Move, Copy and Quit commands. These are important commands which are used like other menu commands. Unlike the other menu commands, however, they have no submenus.

The other six items complete the list of main menu items. Each item governs a certain aspect of the VIP Professional program. The choices are: Worksheet, Range, File, Data, Graph and Print.

We have organized our discussion of menu-related commands into several chapters. This chapter introduces menu commands and gives you some necessary information about them, such as issuing the commands and cancelling wrong choices. It also discusses the Copy, Move and Quit commands. Desk and VIP menu commands are listed and described in the next chapter. Each of the following six chapters deals specifically with one of the items which governs an aspect of VIP Professional.

Invoking a Command by Pointing

There are two ways in which a command can be invoked (or issued). One way is by pointing to it on a menu.

Using a Mouse:

If you are using a mouse, do not press [/] to move to the menu line. Instead, simply move the cell pointer to the menu line. You can move the pointer over the items listed, highlighting each item in turn. As you highlight the items, their drop-down menus appear in columns below them. You can move up and down through these submenus. Each item is also highlighted as you pass over it. To make a command selection, highlight one of the items from the menu line or from a drop-down menu and click.

If you don't want to make a selection, just click the mouse button while the pointer is outside the worksheet window, but not highlighting an item. If you accidentally choose a command, place the cell pointer over the word "Menu" in the mode indicator and click the mouse key. This is the mouse equivalent to a Break. The mouse equivalent of [Escape] is the Escape icon. Move the pointer over the icon and click the mouse button for each time you want to use [Escape]. [Escape] moves you one step back in your current command series.

Using the Arrow Keys:

To point to an item from a menu, first press [/] to let VIP Professional know you are ready to issue a command. The program highlights "Worksheet" on the menu line. By using [Right] and [Left], you can move back and forth along the row, highlighting each

item in turn except the Desk and VIP Menus which can only be reached with the mouse. If you press [Return] while any command is highlighted, a new menu of the sub-commands appears on the menu line. Alternatively, you may be faced with a series of prompts which lead you through a command process.

When items are highlighted from a main menu, you will notice that their submenus appear in a column beneath them. You can skip selecting a main item and select an item from its submenu instead. Use [Up] and [Down] to move through the columns. When the item of your choice is highlighted, press [Return] to enter it.

If you don't want to make any of the selections, simply press [Escape] until you return to the Ready mode or issue a break by pressing [Control][Undo].

Invoking a Command by Typing Command Letters

Another way to issue a command is by using the keyboard to type it. Precede a command, or a series of commands with a diagonal slash ([/]). This lets VIP Professional know that the letters you are about to type belong to a command and are not to be considered as a label.

Now, you can begin to type in the command of your choice. VIP Professional recognizes the command by initial letters and moves on to the next step of the command. For example, if you choose to change the left margin setting of a worksheet in a print file, you will type /PFOML. The diagonal slash begins the command sequence. P chooses the Print item from the main menu. F chooses File from the subsidiary menu. Then, O chooses Options. M chooses Margins and L chooses left. At this point, you may even type in the number of spaces you want the left margin set at (plus [Return] to set the number). Did you notice that there is no need to press [Return] to enter your menu command choices?

If you make a mistake typing in command letters, you can use [Escape] to back up one step at a time in your command sequence. For instance, if you type in "/WGFG" (Worksheet Global Format General), but you really want "/WGDD" instead, you can use [Escape] twice. This takes you back to the Worksheet Global menu. From this point, all you need to do is type in "DD". On the other hand, if you want to escape from the entire sequence, use a break ([Control][Undo]) to go directly back to the Ready mode.

The Menu Mode

When you are selecting menu commands, the mode indicator displays the word "Menu". While you are in this mode, you cannot move freely about the worksheet or enter data. Once you have finished a command series or escaped, the mode indicator changes back to Ready and you can move about the worksheet or invoke another command.

VIP's Messages and Default Entries

Prompts

VIP Professional helps you move from step to step in many commands by issuing prompts. Some examples of what you may be prompted for are file names, range names or other needed pieces of information. These can be specified by typing in the answer you want and pressing [Return] or, when appropriate, by using arrow keys or mouse to point to a name on a list and pressing [Return].

Error Messages

Error prompts may also be used to inform you when an error has been made. VIP uses prompts instead of just beeping at you when there is an error because it tries to give you as much information as possible about the error so that you can solve it easily.

When a minor error is made, like trying to move off the worksheet with your arrow keys, the computer will merely beep at you. It assumes that you are aware of the cause of the error. At other times, VIP Professional moves you to the source of the error in addition to beeping at you. With many of the more sophisticated commands and functions, errors are more difficult to pinpoint. In such cases, VIP Professional displays an error message on the screen until you correct your mistake or press [Escape] (or the mouse equivalent of [Escape]).

Default Entries

VIP Professional may also present you with a default entry. A default entry is an entry which appears automatically on the screen in response to a prompt. Default entries are based on the premise that it is easier to accept or revise an existing entry than it is to type in a new one. In dealing with a default entry you can do one of three things: accept it, revise it or exchange it for one of your choice.

If you accept an entry as it stands, simply press [Return] or click your mouse.

If you want to revise the entry, you can do so while you are still in the Edit mode by using your movement, delete and backspace keys. Characters can also be inserted by typing them in where they belong. You will find that there are a few exceptions in which an entry cannot be revised but must be either accepted as is or completely retyped.

If you would rather type in a new entry, press [Escape] once to erase the existing entry and type in the new entry.

Correcting Typing Mistakes

When you type a command, VIP Professional places you in the Edit mode until you are finished. You can correct any typing errors you make while you are in the Edit mode by using the features made available to you by that mode. This feature is particularly useful when you need to type in a new file or range name.

Once You've Issued a Command . . .

VIP Professional usually returns to the Ready mode after the command or command series has been executed. You can then enter another command or start entering data in your worksheet. However, this, like all rules, has its exception.

There are times when VIP Professional anticipates that you will be issuing several menu commands in succession. The menu of related commands will stay on the screen until the program feels you have issued all the necessary commands.

For example, you may choose Graph from the main menu by typing /G. Then choose and execute a Graph Options Color command to view your graph in color (O for Options and C for color). Choose Quit (Q) to leave the Graph Options menu and go back to the main Graph menu. Then you can choose a Graph Name command by typing N. As you can see, VIP Professional moves from menu to menu within the Graph Options menu until you choose to leave it by using Quit. It then stays in the main Graph menu until you choose Quit again.

When VIP anticipates that you may be invoking several related commands in a row, it often offers the Quit command with the other menu choices. Then, if you want to get back to the Ready mode without making all the selections offered you, you can choose Quit (Q). You may even be able to use Quit several times before you are returned to the Ready mode. For instance, to move to the Ready mode from the Graph Options Format menu, choose Quit once to go back to the Graph Options menu, once again to go to the main Graph menu and a third time to return to the Ready mode.

Escaping from a Wrong Command

Sometimes, you will find that you have issued a wrong command or you might decide that you really don't want to have a command executed even though you have already invoked it. If you haven't executed a command yet (for example, if you haven't sorted a database with the Data Sort command), you can cancel the command by pressing [Escape]. [Escape] backs you up one command step in the present series each time you press it. So if you choose the Data-Range command of the Data Sort command (/DSD), the first [Escape] takes you

back to the Sort menu, the second takes you back to the Data menu, and the third places you in the Ready mode.

If you are using a mouse, you have an equivalent to pressing [Escape]. By moving the mouse over the Escape icon and clicking the mouse key once, you can cancel a command you just issued. If you click the mouse key more than once, each time you press it, VIP Professional will move one step backward in the command sequence.

A fast way to undo a whole series of commands is to use a break. The key combination used for a break is [Control][Undo]. The mouse equivalent is to click the mouse button while the pointer is over the mode indicator. A break will undo all the commands issued in the present series. You will be returned to your last position in the Ready mode.

But how can a command that has been executed be undone? This is harder. In some cases, you will find there is a Reset command which allows you to cancel settings you made using other commands. For example, with the Graph Reset command you have the option to cancel any graph ranges you specified (A - F), the X range, or all your graph settings.

Usually, the only way to undo a command which has already been executed is by issuing another command which voids the first one. For example, if you insert an unnecessary row in your worksheet, you will have to issue a command to delete that row.

Three Independent Commands

As we stated earlier, there are three independent commands (Copy, Move and Quit) which can be found in the main menu. They are independent because they have no submenus. These commands are extremely powerful. They can be invoked at any time in the Ready mode (like the other menu commands), but each is responsible for only one function. Copy copies worksheet entries from one area to another in the worksheet, Move moves cell entries, and Quit allows you to leave your worksheet.

The Copy Command

The Copy command is used to create new cell entries by copying, or duplicating, already existing cell entries. The Copy command can be used to copy both values and labels. In its most sophisticated use, the Copy command can be used to copy formulas and produce projections and extrapolations throughout entire ranges of your worksheet.

Copying Labels and Values

One of the simplest uses of the Copy command is to copy a label or a plain value (not a formula) from one cell to another or from one range to another. It is important to note that the Copy command erases the previous contents of the cell you are copying into and there is no way to recover this information. Any formulas which refer to the copy cells by cell address will remain valid and use the new contents.

"To" (target) and "From" (source) copying ranges should not overlap one another. Overlapping leads to inaccurate copying—except for those rare cases where the two areas share the same upper left hand corner.

You can use a single cell or a range to copy. Ranges must always be rectangular in shape (rows, columns, and other square or rectangular areas are acceptable). Cells which are separated from each other must be copied one at a time.

Copying Formulas

To copy formula(s) of one or more cells to another area, use the same procedure described for copying values and other characters. The difference concerns only those formulas which reference cell addresses. The exact match of the copied cell formula to the new cell formula depends on whether you use absolute cell addresses, relative cell addresses, or mixed cell addresses in the formula. The concepts of absolute, relative and mixed cell addresses are discussed in the "Building Formulas Using Operators and Functions" chapter of the Reference Guide, under the section "Relative and Absolute Cells".

If you use an absolute cell address in a formula, the formula is transferred to the new cell using identical operations and identical cell addresses without regard to its new location.

If you use relative cell addresses in a formula, the formula transfers identical operations. However, because the cell addresses are relative, the cell addresses change in accordance with their new location. If you use a cell address in a formula which is two spaces up and one to the right of the original cell, it will be two spaces up and one to the right in the copied cell. In copying a range specification, VIP Professional adjusts each of the cell addresses independently.

When a formula using a range name in place of cell addresses is copied, the computer automatically assumes that the range is relative. To make the range absolute, precede the range with the absolute symbol "$". This will make the range absolute as a group (that is, each cell of the range is considered to be absolute.

Mixed cell addresses in a formula act as a combination of absolute and relative references. The absolute part of a mixed cell address—whether it is the column or the row—will remain the same. The relative part of a mixed cell address is different in the copied cell formula

than it is in the original. The relative part of the address depends on the distance relationship between the original formula cell and the referenced cell for its location. Basically, this means that the cell address of the formula changes when it is copied, although the change is only in one direction.

Using Copy

First, select the Copy command by typing /C or choosing it from the main menu line. In response to a prompt for a range, use your arrow keys, your mouse, or type the anchor and end cell coordinates (separated by a period) to specify the range or the cell to be copied from (the source range).

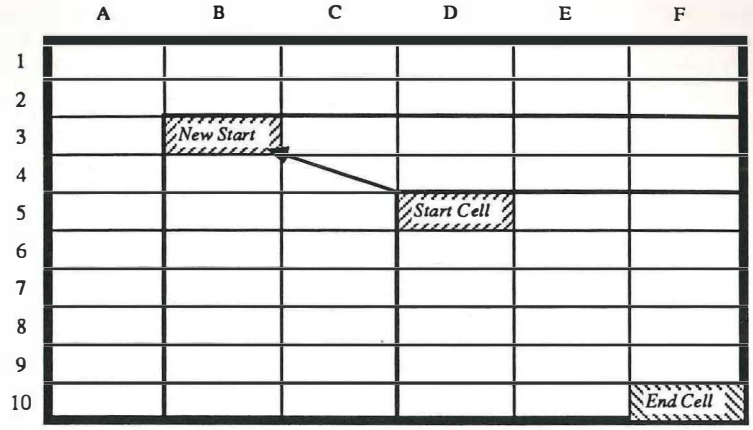
Once you have selected a source range or cell, VIP Professional sends you another prompt. This one asks for a range to be copied to (a target range or cell). In response to the second prompt, specify a range or cell in the same way as you did the first one. VIP Professional does the rest of the work.

The Move Command

The Move command is another powerful command available with VIP Professional. It transfers a cell or range of cells from one location in your worksheet to another. The relationships between the moved cells are not disturbed. This command is particularly suitable for redesigning areas of your worksheet.

Moving cell entries is just like picking them up from one location and placing them in another. Not only are the formulas and other relationships between them unchanged, but all formulas which refer to the moved cells are kept the same as before.

When you move a cell which is located at the top left or bottom right corner of a specified range, you will alter the structure of the range (its range definition). Any formulas which refer to that range will be altered to take into account its new definition. If you move any other cell of a range, it will remove the cell from that range without affecting the range definition.



When the start cell is moved from D5 to B3, the range's definition changes from D5..F10 to B3..F10

Changing a Range's Definition

If you move the contents of a range to another location, it is important to note that any previous entries in that location will be erased. Any cells which are used as references are erased and are no longer valid references. All formulas which used those cell references now display the value "ERR" instead of their former values.

Using Move

To issue a Move command, first select the command by typing "/M" or choosing it from the main menu. In response to a prompt for a range to be moved, specify either a range or a single cell. You may use your arrow keys, mouse or type the anchor and end cell coordinates (separated by a period).

Like Copy, Move has a special feature which allows you to select a range you specified with your mouse prior to invoking Move. Press [Return] to accept the previously specified range when its cell coordinates are displayed next to the prompt or specify another and press [Return] to enter the newest one.

After selecting a source range and in response to a second prompt, indicate the area where you want the cell(s) moved to using the same method you did for the first prompt. This will be the target range. Press [Return] to enter it. VIP Professional will now move your cell or range to its new location.

Using the Quit Command

When you are ready to quit your worksheet, VIP Professional has a special Quit command. To select the Quit command, simply type "/Q", choose it from the main menu or click on the Quit box at the left side of the Title bar. This brings up two options: "Yes" and "No". Selecting Yes ends the work session and returns you to the computer's operating system. Selecting No cancels the Quit command and returns you to the Ready mode in your worksheet.

The most important reason why VIP Professional questions your decision to quit is to give you a chance to save your worksheet if you wish to do so. If you wish to retain your work in some form, use the File Save command to save your entire worksheet, the File Xtract command to save a portion of your worksheet or the Print commands to print your worksheet now or save it in a print file.

Saving Your Worksheet Before You Quit

We strongly suggest that you save your worksheet (with the File Save command) quite often before you quit it. In fact, we would suggest that you save as often as every 15 minutes. Anything from an erroneous command to a power failure can destroy your work if you keep it solely in your computer's memory. Once you have finished your worksheet or are ready to end the work session, you can decide the final form in which your worksheet is to be saved (whether it is all or part, etc.).

Desk and VIP Commands

Introduction

The Desk and the VIP menus are two special menus available with VIP Professional in the GEM version. These two items are different from the other items in that they cannot be invoked by typing their initial letters (preceded by [/]). However, they can be invoked by using the mouse and clicking to make your selection.

The Desk and VIP items are additions to those offered by Lotus 1-2-3. The Desk menu contains utilities specific to the Atari ST. The VIP menu provides functions specific to VIP Professional, and places the Function key commands into an easy-to-use menu.

Desk Commands

The Desk item is an Atari-specific item. This means that it is an item which is common to Atari. If you loaded the VIP program using the GEM desktop, this item will aways be present on the menu line Its functions and its menu items can be found in the *Atari Owner's Manual* and are described there in detail. However, there are a couple of points we'd like to mention here.

If you are interested in getting information about this program, you can get it by using the Professional Info. item. It will show you which program is currently loaded and gives copyright information about that program.

It is from the Control Panel item of this menu that you can control such things as the colors used by the monitor for your worksheet display and for the display of the graphs that you create. If you use certain date functions, you would also want to set the correct time and date using this item. Other things you can do from Control Panel include: setting the mouse and keyboard response times (that is, making them faster and slower), and activating/deactivating audio feedback.

The Install Printer item is another important item from the Desk menu. If you want to print a worksheet or a graph, you will first use the Install Printer item to set necessary printer configurations.

VIP Commands

The VIP menu offers eleven different items. The first ten items of the VIP menu are the ten special functions of the program. These functions can also be invoked from the keyboard, but for mouse users, it may be easier to use the VIP menu.

The ten functions are: Help, Edit, Name, Absolute, GoTo, Window, Query, Table, Calculate and Graph. Although they are listed here, they are described thoroughly at the end of the chapter, "A Summary of Worksheet Basics" of the Reference Guide.

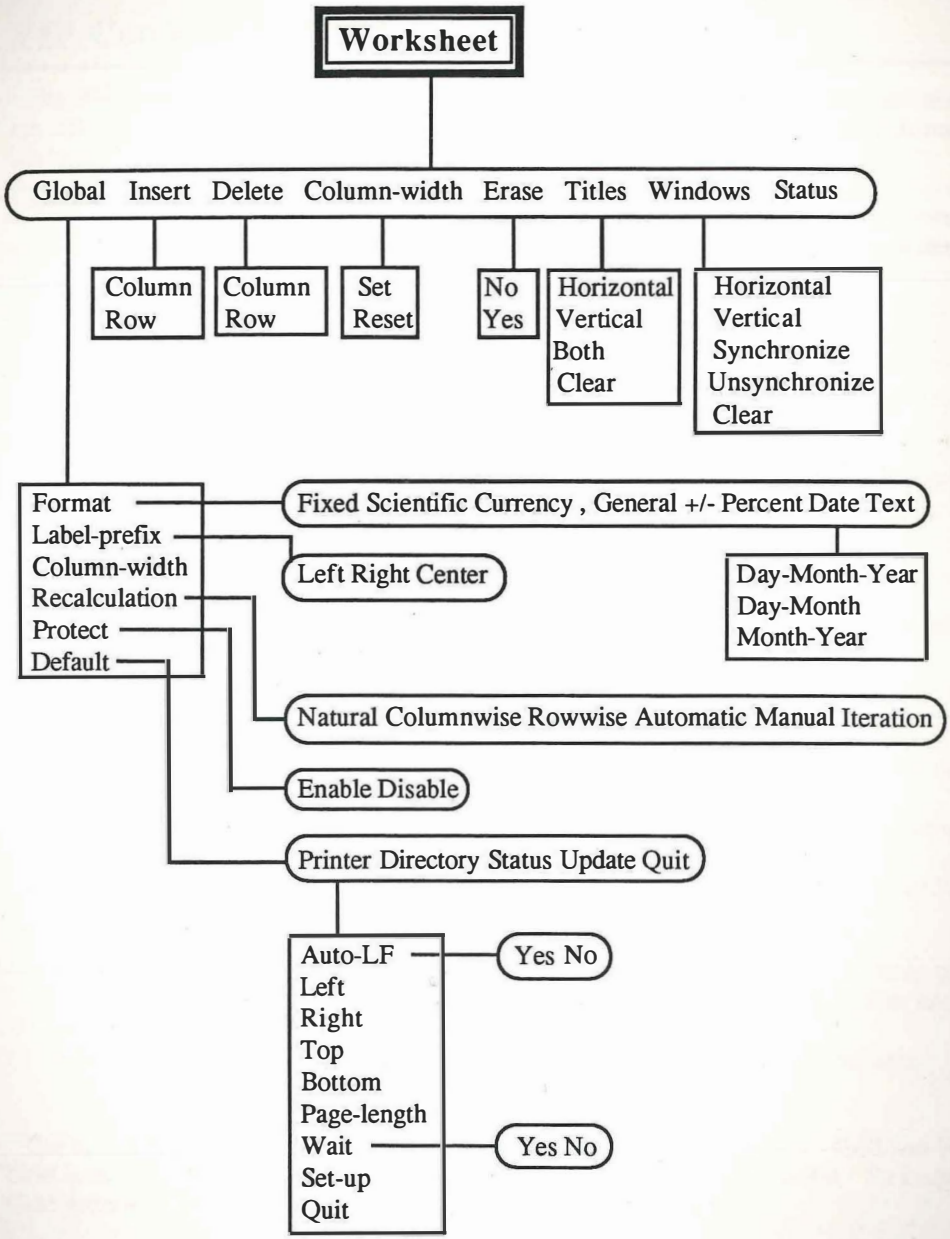
Name	Function
Help	Calls up the Help program.
Edit	From the Ready mode, places you in the Edit mode. From the Edit mode, places you in your last previous mode.
Name	Calls up a list of the worksheet's current range names.
Absolute	Takes a cell or range reference through a cycle of absolute, mixed, mixed, then relative reference types.
GoTo	Moves the cell indicator to a specified cell.
Window	With split-windows, moves the cell indicator from one window to the other.
Query	Performs a Data Query operation using the most previously made settings.
Table	Performs a Data Table (either 1 or 2) operation using most previously made settings.
Calculate	From the Ready mode, recalculates the entire worksheet. From Value or Edit modes, calculates the result of a formula and displays it on Edit line.
Graph	In the Ready mode, it displays a graph using the most recent settings.

The eleventh item is called, "Goodies". Goodies has two subcommands: Grid and Font. Grid is used to make the grid pattern of your worksheet visible or invisible. To keep the Grid pattern, choose "On". To erase the grid pattern, choose, "Off".

The Font item allows you to change the font size of the characters in your worksheet display. You have three choice: Small (S), Medium (M) and Large (L).

Worksheet Commands

Worksheet Global
Worksheet Insert
Worksheet Delete
Worksheet Column-Width
Worksheet Erase
Worksheet Titles
Worksheet Window
Worksheet Status


Worksheet
Global Insert Delete Column-width Erase Titles Windows Status
Column
Row
Column
Row
Set
Reset
No
Yes
Horizontal
Vertical
Both
Clear
Horizontal
Vertical
Synchronize
Unsynchronize
Clear
Format
Label-prefix
Column-width
Recalculation
Protect
Default
Fixed Scientific Currency , General +/- Percent Date Text
Left Right Center
Day-Month-Year
Day-Month
Month-Year
Natural Columnwise Rowwise Automatic Manual Iteration
Enable Disable
Printer Directory Status Update Quit
Auto-LF
Left
Right
Top
Bottom
Page-length
Wait
Set-up
Quit
Yes No
Yes No

Worksheet Commands

Introduction

The Worksheet menu is used to design a worksheet which suits your needs. The commands affect your worksheet as a whole or are used to make large-scale changes in it. Worksheet commands are also used to manage your worksheet display.

One group of commands is used to set defaulted instructions for a current directory along with printing information such as margins. A defaulted command is one where VIP Professional automatically assumes certain selections. You do not have to make your own selections unless you want to tailor the features to meet special needs. In general, defaulted commands are most in evidence in the Worksheet aspect of the VIP Professional program.

A set of commands, called "global", are responsible for changes that take place throughout the worksheet. Other commands include changing column-width(s), adding or deleting rows or columns, splitting the worksheet window, freezing titles on the screen and erasing worksheet contents.

Worksheet Global Format

VIP Professional considers values separately from labels when formats are set. Worksheet Global Format commands are used to change the format of number cells (i.e. cells which display values). However, these commands have no bearing on the display of labels.

The format commands only determine how VIP Professional stores values for display, they do not change the values themselves. This is important to remember because, at one point, you may round your worksheet values off to two decimal places. For example, a number such as 314.323 will then be displayed as 314.32. If, at a later point, you decide to change the display setting to four decimal places, VIP Professional remembers the original numerical value and now displays the number as 314.3230. VIP can effectively remember the values you enter to 15 decimal places. In addition, if a format makes a value too long to be displayed within a cell, asterisk marks are placed across the cell. For the value to be displayed, the format must be changed so the display is shortened or the column width must be widened to accomodate the value in the cell.

The Worksheet Global Format command can be used in conjunction with the Range Format command. Where it is used, the Range Format command overrides the Worksheet Global Format command. If, for example, you numbered a series of rows in a worksheet, you might want to have the numbers displayed simply as positive integers. What if all the other values needed to be displayed as dollars and cents? The first thing you would do is select the Currency option of the Worksheet Global Format command. Notice that all your values are now displayed as dollars and cents. Now, select the Range Format command and

specify the column of values numbering the rows as the range. Choose the General format option. The column of numbers is displayed as positive integers while the other values of the worksheet continue to be displayed as U.S. currency.

Select the Format command from the Worksheet Global menu (/WGF). Then, choose the display format you want and enter it. There are nine available options:

Currency:
Choose Currency (C) from the Format menu. U.S. dollar symbols are used. Negative values are displayed in parentheses. Commas are used after every third digit to the right of the decimal point. Enter the number of decimal points you want the values rounded off to. Your choices are 0 to 15. Press [Return].

Date:
Choose Date (D) from the Format menu. Choosing Date causes the values of your worksheet to be considered "serial dates" and to be translated and displayed as dates. This format is most often used with date arithmetic (see the section on "Date Arithmetic" in the chapter, "Building formulas using Operators and Functions"). With the Date format, you have three choices: 1) Day-Month-Year, 2) Day-Month and 3) Month-Year. Make a choice by typing the number of the selection and pressing [Return]. Day and year are displayed numerically (with two digits each) and month is displayed as abbreviated text (with three letters). For example, a date would be displayed as "09-MAR-85".

Fixed:
Choose Fixed (F) from the Format menu. The Fixed format allows you to set the number of digits you want displayed after the decimal point. Then enter the number of decimal places (your choices are from 0 to 15) to which all values will be carried. Press [Return].

General:
Choose General (G) from the Format menu. This chooses the standard format. Trailing zeros after a decimal point are not displayed. Large numbers are displayed in scientific notation. This is the initial, defaulted format for VIP Professional.

Percent:
Choose Percent (P) from the Format menu. The Percent format displays values as percentages. It displays a percent sign after the number. Enter the amount of decimal places you wish your percentages rounded off to (your choices are 0 to 15).

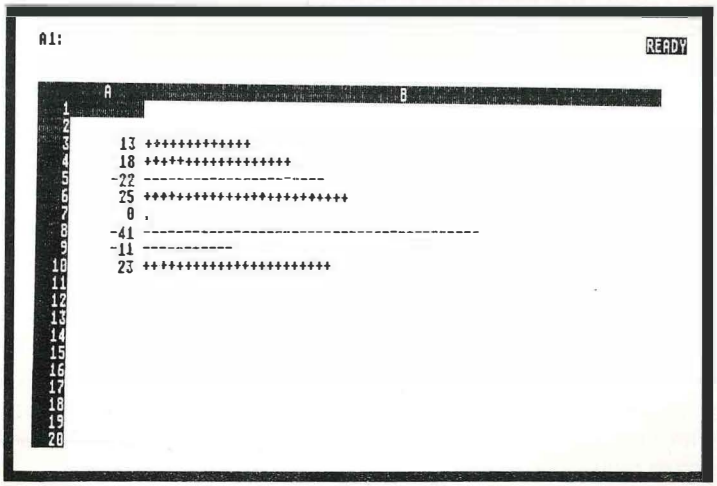
Scientific:
Choose Scientific (S) from the Format menu. This format displays your values as scientific exponentials, rounded off to the number of decimal places you select. Enter the number of decimal places (0 to 15) which you want the multiplier rounded off to.

Text:
Choose Text (T) from the Format menu. This displays the formulas instead of their current values in the cells.

The text format is often used to compare values displayed with the underlying formulas. This is done by using the Worksheet Window command. One window is used to view the resulting values, while the other window is used to view the underlying formulas.

Comma:
Choose Comma (,) from the Format menu. Your values will be displayed with commas after every third digit from the right of the decimal place and with the number of decimal places you specify. Negative values are displayed in parentheses. Choose the number of decimal places to be rounded off to (between 0 and 15). Press [Return].

Plus or Minus:
Choose Plus or Minus (+) from the Format menu. This format is used to create horizontal bar graphs. The number of symbols represents the integer. "+" is used for positive integers, "-" is used for negative integers and "." is used for zero.



Using +/- Format

Worksheet Global Label-prefix

To change defaulted settings for label formats, use the Worksheet Global Label-prefix command. Label formatting information is stored differently than numerical formatting is. Labels do not change their appearance like values do. Instead, changes in label formatting come about from the way labels are placed in their cells: either flushed left, flushed right or centered. Another prefix, the "\" character can be used individually to repeat the cell' contents across the cell. There is no global worksheet command option available for the repeating label format.

A prefix character (or label prefix) is one of four characters which determine a label's appearance in a cell. When you are in the Label or Edit mode, it will appear in the control panel as you type in the label. The prefix character is not displayed in the worksheet, however.

Prefix	Effect
'	Align to Left
"	Align to Right
^	Center

The label formatting information is stored with the labels individually. However, with the Worksheet Global Label-prefix and the Range Label-prefix commands, VIP can default an area to use one of three label prefixes (left, right or center) when a label is entered.

Since label alignment is initially defaulted to the left, you will notice that, if you type in labels without changing the label format in some way, all your labels will be preceded by an apostrophe (') which aligns them with the left of the cell.

By selecting the Label-prefix command from the Worksheet Global menu (/WGL), you can change the original left alignment to the right, or center it. The Worksheet Global Format command affects only those labels you create after issuing a change. Previously created labels will remain positioned as they were before the change. When you specifically enter a label prefix, or if you use the Range Label-prefix command, you will override the Worksheet Global Label Prefix.

Although the fourth label prefix (\) is not available with the Worksheet Global Format command, it can be used individually to make a label repeat itself throughout the cell. When used with the Copy command, this feature is especially handy for typing lines and dashed lines across your worksheet.

If the label is as long, or longer, than its cell, alignment doesn't matter because VIP will fill the cell and continue past the cell into the cell to the right, fill that cell, move on to the next right cell and so on until the entire label has been accomodated. Although a cell can

contain as many as 240 characters, the display will show only as many as will fit across the screen at one time.

Any time you begin a label with a number or any other character which might cause VIP Professional to think that you were entering a value instead of a label, you must specifically precede it with a character prefix to let VIP Professional know that it is definitely a label. If you are creating a Keyboard Macro and you begin a label with a keystroke which is a value prefix or the command prefix [/], be sure to precede it with a character prefix also.

There will be times when you wish to change alignment of already existing smaller groups of and single-cell labels. In such cases, use the Range Label-prefix command for groups of labels or use the Edit mode for single-cell changes.

Worksheet Global Column-width

When we speak of column width in your worksheet, we are referring to the number of character spaces it takes to fill a cell in that column. Your worksheet is structured as a gridlike pattern of cells which is organized into columns and rows. Any changes you make in the width of one cell will be reflected in all other rows of the column.

Although the column width is initially defaulted to 9 spaces, by selecting the Worksheet Global Column-width command, you may change the width of all the columns of your worksheet. To do so, select Column-width from the Worksheet Global menu (/WGC). VIP Professional will display the current global width setting. To set a different column-width, you can use your [Left] and [Right] keys. You could also type in the number of characters you want for the column-width and press [Return].

The [Right] and [Left] keys adjust the current cell width. Each time you press [Right], one space is added to the width. Each time you press [Left], one space is subtracted. When you reach the desired width, press [Return] to set it.

The Worksheet Global Column-width command only affects the window in which the cell indicator is located. For example, if you have split the screen into two vertical windows and the cell indicator was in the left window when you issued the Worksheet Global Column-width command, then only the left window would be affected.

Worksheet Global Protection

Often, worksheets are created to be used by untrained personnel. Because of this, it may be desirable to protect areas of your worksheet from accidental changes, leaving only the areas which require entry accessible. This is done by using the Worksheet Global Protection command (/WGP) in conjunction with the Range Unprotect command (/RU).

The Worksheet Global Protection command is the only command which can activate worksheet protection. If it is not on, the Range Protect command will be ineffective.

Once you have protected the worksheet by enabling Worksheet Global Protection, you may then use the Range Unprotect command to unprotect areas of the worksheet for data entry. Should you later decide to protect areas unprotected with the Range Unprotect command, you may then use the Range Protect command to protect those areas. If you decide to turn off protection altogether, simply disable global protection.

As an example, you might wish to create a monthly balance sheet to be used by your bookkeeper. Worksheet Global Protection is enabled to protect your formulas, labels and instructions. Since the monthly values will have to be re-entered each month, use the Range Unprotect command in those cells to override the Global Protection command. In the ranges you have specified with Range Unprotect, protection will be lifted from the cells.

Once you select the Worksheet Global Protection command, you will be offered two choices: Enable (on) and Disable (off). Type E to enable or D to disable.

Worksheet Global Recalculation

The Worksheet Global Recalculation menu allows you to turn the automatic calculation feature of your worksheet on and off. It also allows you to choose the type and number of calculations you want done on the same worksheet. Calculation affects only the formulas and values which are related to the formulas. Calculation and recalculation of worksheets is also discussed in the chapter, "Building Formulas Using Operators and Functions".

When you select Recalculation from the Worksheet Global menu (/WGR), you are offered a submenu with five commands governing the type and/or order of calculation (Automatic, Manual, Column, Row and Natural) and one command allowing you to choose the number of times you want recalculation to occur (Iteration).

Automatic is the default setting. Every time you add or change an entry, VIP Professional will automatically calculate your worksheet for you. Automatic recalculation can be time consuming, particularly when your worksheet is fairly large. You may switch to manual recalculation to save time between entries. Choose Manual from the Worksheet Global Recalculation menu (/WGRM). Now the worksheet will only be recalculated when you want it to be. To switch back to automatic recalculation, select Automatic from the Worksheet Global Recalculation menu (/WGRA).

Natural recalculation is the default setting for order of calculation. This causes calculation to occur in the order of columns (from left to right). Every time VIP Professional comes across a forward reference (a formula which refers to another cell whose contents have not been calculated yet), it calculates the contents of the cell further ahead before it jumps back and continues calculating in the order of columns. If you choose another type of

recalculation, then decide to return to natural calculation, you must choose Natural from the Worksheet Global Recalculation menu (/WGRN).

Another option you have for recalculation order is columnwise. Columnwise order recalculates the worksheet in the same order as natural does; column by column, from left to right. However, with forward references in columnwise order, the referenced cells do not have their contents calculated before the formula cells are calculated. Columnwise can be chosen from the Worksheet Global Recalculation menu (/WGRC).

Instead of performing calculations in the order of columns, they can be performed in the order of rows. To do this, invoke the Row command from the Worksheet Global Recalculation menu (/WGRR). This will cause calculation to change from the order of columns to that of rows (from top to bottom). One reason you may decide to use rowwise instead of columnwise (or vice versa) is that it can avoid some simple forward reference problems which might occur otherwise.

Iteration is the command which controls the number of times calculation occurs. Some complex formulas only achieve accurate results in calculation after being recalculated a number of times. You may also wish to check calculations by recalculating to see if different results can be obtained. Choose Iteration from the Worksheet Global Recalculation menu (WGRI). Then choose the number of times you wish calculation to occur by typing in the number (between 1 and 50) and pressing [Return]. At the next calculation, the worksheet will be recalculated the number of times you specify.

Calculation of your worksheet does not always lead to the same results, nor are the results always completely accurate. Two major problems in calculation are forward references, which may occur when using the Row or Column method of recalculation, and circular references. Forward references are formula cells which refer to cells whose contents haven't been calculated yet. Although the Natural recalculation automatically takes care of forward references, the Row and Column methods do not. Circular references are formula cells which refer to other cells which refer back to themselves (the values of the cells are interdependent). If VIP ever finds a circular reference while it is calculating your worksheet, a small Circular Reference icon will be displayed in the Control area of your screen.

It is also a good idea to check the order of precedence in calculations (see "Building Formulas Using Operators and Functions") if you are obtaining unexpected results. The order of precedence makes a difference in the way individual formulas are calculated. This, in turn, can affect many formula cells in the worksheet.

Worksheet Global Default

The Worksheet Global Default commands control a group of settings which are used automatically every time you retrieve a worksheet. The commands are used to let the computer know which directory is to be used for saving and retrieving files, what type of printer and interface will be used, and the configurations of the printed page (for example, the margins and line spacing). Since they are defaulted, these commands will remain the same for the worksheet until you change them. Except for deciding the directory, the command choices can be changed from the Print menu (see the chapter, "Print Commands"). The current directory can be changed with the File Directory command (see the chapter, "File Commands"). If you wish to save any changes you make with these commands for another work session, be sure to use the Update command from the Worksheet Global Default menu (/WGDU).

To alter the originally defaulted printer configurations and directory, select Worksheet, Global, then Default (/WGD). This will result in the submenus of commands which decide the directory (called "folder" with Atari) and printing values. Of course you can change folders by opening another folder icon (as described in your Atari manual).

Choosing a Directory

A directory decides where your files will be saved to and which files you can retrieve. It decides both the disk drive and the name of the folder which will be saved into and retrieved from. To choose the command, select Directory (D). Then specify the disk drive and directory you want. This is done by typing "Letter of Disk Drive (choose from A - C):\(Name of directory)". The letters are: A for the first disk drive (with floppies), B for a second disk drive (with floppies) and C for hard disks. For example, if you type "B:\ACCTS", all your files are saved and retrieved to the "B" disk drive and the directory (or folder) "ACCTS". This means you've decided not to change the target directory from what it is.

If you wish to save or retrieve files to another directory at a later time, you may use this command again. You may also change the setting with the File Directory command, or, in many cases, you can specify another disk when you enter a file name by typing the disk prefix (one of the letters from A - C) and the folder name, if necessary.

Choosing Printer Information

Other defaulted commands are those which control the printer. Select Printer (P) to bring up the Printer Control submenu. We will discuss each subcommand in the paragraphs below. First, we will list the initial configuration values. They are as follow:

Auto Line-feed: No
Top margin: 2
Bottom margin: 2
Left margin: 4
Right margin: 76
Page Length: 66
Set-up string: None
Pause at end of page (wait): No

Automatic Line Feed

The Automatic Line Feed command is chosen with Auto-LF (A). It controls whether or not there is to be automatic line feed at the end of each line, which, in turn, is dependent on what your printer requires. Your choices are Yes (Y) and No (N). If you choose Yes, the printer will automatically be sent a line feed after a carriage return. If you choose No, the printer will not be sent a line feed after each carriage return. Press [Return] to enter your choice.

Margins

VIP Professional lets you alter the margins for printing so that you can control the aesthetics of your printed reports. The default settings assume an 8 1/2" x 11" sheet of paper using a 10 pitch typeface (10 characters per inch). The default margins are a top margin of 2 lines and a bottom margin of 2 lines, giving you 62 lines of text. The left margin is 4 spaces and the right margin is 76 spaces, giving you 72 characters per printed line.

You may, however, decide to change the defaulted printer configurations for printing on computer paper, or based on a compressed font which gives 16.7 characters per inch, or for some other purpose. VIP Professional allows you to do this by changing any of the defaulted settings.

Top Margin

The Top Margin command sets the top margin for the printed page. This margin is expressed as the number of lines from the top of the page. Choose Top (T). Then select either the initial defaulted value or one of your own. To select the initial defaulted value, press [Return]. To change the defaulted value, type in the number and press [Return].

Bottom Margin

The Bottom Margin command sets the bottom margin for the printed page. This margin is expressed as the number of lines from the bottom edge of the page. First, choose Bottom (B). You have a choice between 0 and 10 or using the initial defaulted value. If you would like to make your own selection, type in the number of your choice and press [Return] to enter it. If you want to continue using the defaulted value, press [Return].

Left Margin

The Left Margin command sets the left margin of your printed page. Choose Left (L). Your choices are retaining the original defaulted value (by pressing [Return]) or choosing a new value of 0 to 240 character spaces. To choose a new number, type the number and press [Return].

Right Margin

The Right Margin command sets the right margin of your printed page. First, choose Right (R). You may keep the initial defaulted value by pressing [Return] or you may select a value of your own. To use your own value, type in a number between 0 and 240 (character spaces), then press [Return]. Note that the right margin is determined by the number of character spaces from the left edge of the paper to the right side and not from the right edge towards the left.

Page-Length

The Page Length command sets the page length of the printed page. First, choose Page-Length (P). Then, you may retain the original page length or specify a new one. If you wish to retain the original setting, press [Return]. If you wish to change it, specify a number between 20 and 100 by typing it in and pressing [Return]. The standard 11" page length is 66 lines. One inch equals six lines.

Set-up String

The Set-up String command allows you to set up a string of printer control codes to control special features of your printer, such as the compressed font. Set-up strings are discussed in the Options section of the Print Commands chapter (under Set-up) and also in Appendix D. Type in a set-up string and press [Return] or simply press [Return] if you decide not to include a set-up string.

Wait

If you are using a single-sheet feed printer, the Wait command is used to tell the printer to wait for a paper change between each page. Select Wait (W). Specify Yes (Y) or No (N). "Yes" signals that printing should be held up between pages. If you choose it, you will have to press [Return] to resume printing after every page. "No" signals the printing should continue automatically page by page.

Status

The Status command displays all the current selections of the Worksheet Global Default commands (Directory, Automatic Line Feed, Printer Interface, Margins, Page Length, Set-up String and Wait). Choose Status (S). The settings for the Worksheet Global Default commands will be displayed on the screen. Press any key to go back to the worksheet display.

Update

The Update command is used to save the defaulted settings (including those you may have changed with the Worksheet Global Default command) for future use. If you do not update the settings, they will revert back to the original settings the next time you start VIP Professional. Select Update (U). Your configuration settings are now saved.

Quit (in Printer and Default Submenus)

The Quit command helps you move out of the Printer submenu or out of the Worksheet Global Default menu. Select Quit (Q) if you wish to get out of the Printer submenu. Then select Quit (Q) again if you wish to get out of the Worksheet Global Default menu. This will return you to the main Worksheet menu.

Worksheet Insert Rows and Columns

There are two commands which are used to insert space in a worksheet. The Worksheet Insert Rows command is used to insert one or more rows and the Worksheet Insert Columns command is used to insert one or more columns in your worksheet. These commands are for adding space for additional data, or for beautifying your worksheet.

When a row or column is added, the other rows or columns move downward or to the right to accomodate the inserted areas. Usually, no rows or columns are lost at the ends of your worksheet since the borders of the worksheet expand to allow for the inserted areas. VIP Professional automatically adjusts cell references in moved rows or columns to correspond

with their new locations. Initially, the inserted areas use the global formats (for value and label displays, and for column width with rows).

To insert rows, first place the cell indicator on the row below which you want the space inserted. Select the Row command (/WIR) from the Worksheet Insert menu. A prompt will appear on your screen asking for a range. Use your arrow keys or your mouse to move the cell indicator down the number of times you want a row to be inserted. Press [Return].

To insert columns, first place the cell indicator on the column before where you want the space to be inserted. Select Column (/WIC) from the Worksheet Insert menu. As with inserting rows, respond to the prompt by using your arrow keys or mouse to indicate the number of columns you want inserted. Press [Return].

Worksheet Delete Rows and Columns

The two commands, Worksheet Delete Rows and Worksheet Delete Columns, are used to delete one or more complete rows or columns in your worksheet.

After deleting a row or a column, the remaining rows and columns are moved up or left to fill the gap made by the deleted space. If there are any cell references in your worksheet which refer to one of the deleted cells, then the formulas depending on them display the "ERR" value.

To delete rows, first place your cell indicator over the first row you wish to delete. Select Row from the Worksheet Delete menu (/WDR). In reply to the prompt which appears, use your arrow keys or mouse to specify the number, or range, of rows you want deleted by moving your cell indicator over them. Press [Return].

To delete columns, place your cell indicator over the first column you want deleted. Select Column from the Worksheet Delete menu (/WDC). A prompt appears on the screen asking for a range. Use your arrow keys or mouse to indicate the number of columns. Press [Return].

Worksheet Column-width

The Worksheet Column-width command is used to change the width of a single column. This command is similar to the Worksheet Global Column-width command, except that it operates on single columns and allows you to "reset" column widths to the global format. The Worksheet Column-width command overrides the Worksheet Global Column-width command.

To set the width of one column, move the cell indicator to a cell in that column. Select the Column-width command from the Worksheet menu (/WC). You have two options: Set

(S) or Reset (R). If you choose Set, you can set the column-width with your arrow keys or mouse. With [Left] and [Right], subtract or add one space at a time to the current width. Press [Return] when you reach the desired width. To use the mouse, move the pointer into the columns border. The pointer will change to a grooved square, called a grabber. Move the grabber over a line dividing the columns (in the columns border), and hold the mouse button down while you drag the line to reach the desired width. Then, let up on the mouse. As a third option, you can type in the number of spaces for the column width and press [Return].

If you want to return the column-width setting to the global column-width setting, use the Reset option of the Worksheet Column-width command. To reset column-width settings, select the Worksheet Column-width command after you have positioned the cell indicator on the target column. Select the Reset option (R). The column is returned to the globally defaulted setting.

Worksheet Titles

The Worksheet Titles command is used to lock rows, columns or both in place on your screen so that when you scroll through your worksheet, the row and/or column will remain visible.

On your screen, column letters and row numbers form a border near the top and at the left edge of the screen. When you move the cell indicator down or to the right, notice that these borders will remain in place to indicate your position on the worksheet. The borders are said to be "frozen".

Sometimes, you will find that it is convenient to maintain a vertical or horizontal section of your worksheet in one place while you scroll through and make changes in other sections of your worksheet. Just as the borders at the left and top of the worksheet display are "frozen", you can "freeze" the worksheet sections horizontally, vertically or both. This is known as "title locking" or "freezing titles".

To freeze your titles, first select the cell to the right of or beneath the columns or rows you wish to freeze. Next, select the Titles command from the Worksheet menu (/WT). Then, choose whether to freeze the Row(s), Column(s) or Both (R, C, or B). The titles are now frozen on the screen from the position of the cell indicator to the left edge of the worksheet (for Columns), the top edge of the worksheet (for Rows) or both (for Both). A line acts as a border around the frozen area to separate it from the rest of your worksheet. The frozen area will remain in place as you scroll through your worksheet in any direction.

An additional difference between this and other areas of your worksheet is that you will not be able to enter the frozen area using your cell indicator in the Ready mode. This is a protection feature which protects the titles area from accidental alteration. Still, there will be times when you need to enter the titles area. You may do so by using your mouse or the

GoTo function ([Function 5]). When you do so, the Titles area will be duplicated below and/or to the right of the original titles area. This is done so that you may alter the copy, but still not get into the actual Titles area. Any changes you make to the duplicate Titles area will be reflected in the original Titles area. Once you scroll the duplicate Titles area off the screen, it will no longer be displayed.

To unfreeze titles, select the Clear command from the Worksheet Titles menu (/WTC). The worksheet display returns to normal.

Worksheet Window

The Worksheet Window command allows you to split the screen into two segments, or windows, so that you can simultaneously view different, unconnected areas of your worksheet.

There are times when you want to compare different sections of your worksheet. You can even view the same section of the worksheet in different windows and in different ways. The easiest way to do this without printing is to use the split-window feature of your VIP Professional to split the screen. The split windows may be created horizontally or vertically.

There are two ways to create windows: with the mouse and with the Worksheet Window command. Using the mouse, move the pointer either to the line above (for a horizontal window) or to the left (for a vertical window) of the worksheet. When you do this, the pointer will change into a grooved square, or "grabber." Use the grabber to drag the line over the worksheet to the desired position for window. When you let up on the mouse button, the window will be created. If you drag the line back, the windows will disappear.

You may also use the Worksheet Window command. To create a horizontal window, place the cell indicator in the row below where you want the division to be. Select the Window command from the Worksheet menu (/WW). Next, select Horizontal (H). The display will be divided into two windows. The cell indicator will reappear in the last row of the source window (the first window).

To create a vertical window, follow the same procedure used for creating a horizontal window. The only difference will consist of selecting Vertical (V) rather than Horizontal as the third step in the procedure.

When you are ready to reunify the split windows, use the Worksheet Window Clear command (/WWC).

Just like the undivided screen window, split windows use the grid pattern of the worksheet as a basis for operations. The actual positions of the cells on the worksheet are remembered and displayed on the borders. All commands which work on the grid as a whole, except for

printing or saving, will work separately on each of the windows. It's important to remember that although you are now viewing two sections of your worksheet rather than one solid section, it is still the same worksheet.

In some ways, the windows are independent from one another. The cell indicator can be used to move around each screen area. Each can have its own global display formats and global or individual column widths, and you can even use the split-window feature to view the same area differently in both windows. For example, in one, you could see the underlying formulas displayed in their cells, while in the other, you could view their current values.

The window in which the cell indicator is located is the one which is active. The cell indicator can be moved from one window to the other in two ways. The first is by using the Window function [Function 6]. By using [Function 6] from the keyboard or selecting it from the VIP menu, the cell indicator will be moved from window to window. The other way to move from one window to another is by using the mouse to move the cell pointer. Move the cell pointer to a cell you want in the other window, then click the mouse button.

Synchronized Scrolling

When you first split the screen, the windows are automatically synchronized horizontally or vertically (depending on which type of split-screen window you have). This means that horizontal windows scroll to the left or right together, but aren't linked when you move up or down in either of the windows. The same principle holds true for vertical scrolling: scrolling up and down in one window is synchronous in the other. Horizontal scrolling remains independent.

This synchronized scrolling can be unlinked. To do so, select the Unsynchronize command from the Worksheet Window menu (/WWU). The scrolling is no longer linked.

To reactivate synchronized scrolling, select the Synchronize command from the Worksheet Window menu (/WWS). The scrolling is now relinked from left to right for horizontal split-screen windows and up and down for vertical split-screen windows.

Worksheet Erase

The Worksheet Erase command is used to delete all the information entered in your worksheet. This command should only be used if you feel that the work you did during the session is unusable.

Any information currently stored in the computer is lost. All individual settings are lost and global settings are returned to their initial values.

To issue the Erase command, select it from the Worksheet menu (/WE). VIP Professional will require that you confirm this command. Choose Yes (Y) or No (N). Choosing No will bring you back to your previous position in the worksheet. Yes erases all the information and settings you have added to your worksheet since it was first displayed. Default settings are returned to their initial settings.

Worksheet Status

The Worksheet Status command is used to give you information about your current worksheet. It displays the amount of available memory you have left for your worksheet and the global settings in effect. The settings displayed are those for recalculation, global format, global label prefix, global column width and global protection.

Select Status from the Worksheet menu (/WS). A table will appear on the screen. It lists the setting types and the selections that are currently in effect. It also lists the amount of memory still available for your use. When you are finished viewing this table, press any key to return to your worksheet in the Ready mode.

Using Computer Memory for your Worksheet

As we mentioned earlier, there is no simple correlation between the amount of memory used by your computer for your worksheet and the amount of memory needed to save your worksheet. Of course, the larger the worksheet is, the more memory it will use—whether you are working on it or have saved it to a disk.

It is not just the data that you have entered in your worksheet which requires memory, empty rows and columns in between your work may also use memory. For instance, if you format a range, then delete its data using a Range Erase command, you will find that the deleted range still uses memory. To regain memory, first unformat the deleted range area (by using the Reset command from the Range Format menu on the area). Then, wherever possible, move the data in your worksheet up to fill the blank areas. Now, use the File Save command to save your worksheet. Then, use the File Retrieve command to retrieve it. When next you use the Worksheet Status command, any changes in available memory will be displayed.

If the Worksheet Status command is used a second time in a work session, the Status table will display the results of additional memory usage by the worksheet, but it does not display subtracted memory usage. If you erase data or free memory in any way, you will need to use both the File Save and File Retrieve commands before the Worksheet Status command can be used to display the updated information.

Range Commands

Range Format
Range Label-Prefix
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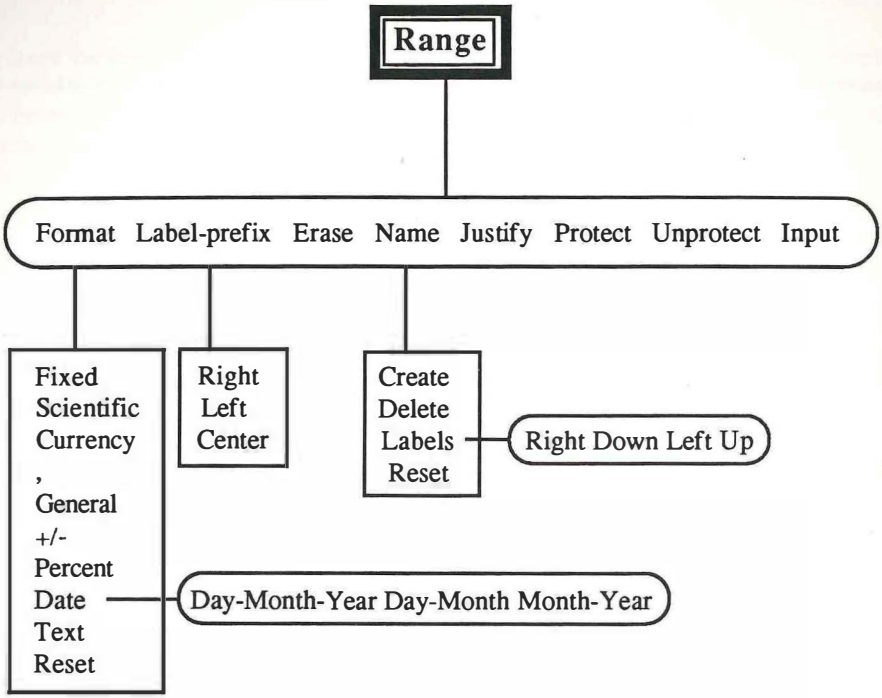
Range
Format Label-prefix Erase Name Justify Protect Unprotect Input
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Scientific
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Range Commands

Introduction

Range commands are used to process groups of cells in a worksheet. Many of the commands are similar to ones found in the Worksheet menu and in other menus. The most significant difference is that instead of being carried out through the entire worksheet, Range commands only affect a certain prespecified range. A range is a single rectangular area consisting of one or more contiguous cells.

Range parameters are set through the use of two cells, the "start" (or "anchor") and the "end" (or "free") cells. The upper left cell of a range is initially the start cell and is considered the first cell of the range. The lower right cell, which is usually the free cell, is used to expand or shrink the borders of the range. When ranges consist of only one cell, the start and end cells are the same. Range borders are always exactly horizontal and vertical, the corners forming 90-degree angles. Frequently, ranges consist of rows, columns or some other type of rectangular area.

When to Specify a Range

Many VIP commands require that one or more ranges be specified. VIP will prompt you when it requires a range as part of a command.

If you are using a mouse, there are times when you may specify a range before selecting a command. Then, when you invoke the command, you may accept the prespecified range or you may define a new one. For example, if you select the Copy command after you specified a range with your mouse, you may use the range by pressing [Return] when you are prompted for a source range and your selection appears typed in next to the prompt. If you do not wish to accept it, you may press [Escape], then specify and enter another range in one of the ways described in the next section. VIP will use the most recently specified range.

With some commands, such as Data Query and Data Sort, ranges are remembered from the first time and displayed if you use the command again. To accept these defaulted values, press [Return]. To change such a range, press [Escape] and specify a range of your choice in its stead.

How to Specify a Range

For the Range commands, and for many other VIP Professional commands, you will need to specify a range in response to a prompt. Ranges can be specified three different ways: by using your arrow and other movement keys, by using the mouse and its movement aids, and by typing in the cell coordinates of its start and end cells. Once created, ranges can be named and reused by name in command procedures requiring ranges. Named ranges are discussed thoroughly later in the chapter.

When you use your arrow and other movement keys to specify a range, you must first move the cell indicator over the anchor cell. Press [.]. Next to the prompt for the range, the cell coordinate of the start cell, followed by two periods and the same cell coordinate will appear. Once you start moving the cell indicator toward the end cell, the second cell coordinate will change, reflecting the movement of the cell indicator. If the range is fairly small, you will probably use your arrow keys to move to the end cell. If the range is larger, you may decide to use the page, tab or other movement keys in combination with the arrow keys. Once you have moved the cell indicator to the end cell, press [Return]. Next to the prompt for a range, you will see the cell coordinate of the start cell, two periods and the cell coordinate of the end cell.

Ranges are selected with the mouse by dragging the pointer across the cells to be included in the range. Just press the mouse button down when the pointer is over the start cell, then drag the mouse until the pointer is over the end cell, and let up on the button. If you decide to change the range, move the pointer over the new end cell and press the mouse button while holding down the [Shift] key. When you have finally decided on your range, click on the Checkmark icon or press [Return].

It is even easier to include parts of your sheet which are currently off the screen in your range. First select the cell which is to be the start cell. Next, use any method to go to the cell which is to be the end cell. With the pointer over the end cell, click the mouse button while holding the [Shift] key. You may [Shift]-click to alter the end cell as you please. To set the range, press [Return].

Ranges can also be specified by typing. Type the cell address of the top left cell of the range, a period and the cell address of the bottom right cell. Press [Return] to enter it.

If you have used the Range Name command to name an existing range, you may also type and enter the range name in response to a prompt asking for you to specify a range.

Rotating the Anchor Cell

When a range is specified (but not yet entered), its anchor, or start, cell can be changed by moving its position from corner cell to corner cell in a clockwise fashion. This can be done with the mouse or by pressing [.].

If you are using a mouse, move the pointer to the Express icon while the range is still highlighted. At the center of the Express icon, is a block-shaped cross. This is the Anchor Rotation figure. Click the mouse button over it. Every time you click the mouse button, the anchor cell is rotated to the next corner cell. To move the anchor cell from corner to corner of a range by pressing [.], first move the cell indicator to the current anchor cell. Next, press [.]. Every time you press [.], the anchor cell will be moved to the next corner.

Range Format

Just as the Worksheet Global Format command is used to set the global worksheet display of numerical values, the Range Format command is used to set the display of numerical values in a specified range. The Range Format command overrides the Worksheet Global Format command in those areas where it is used.

As with Worksheet Global format, the values themselves aren't changed, only the way they are displayed is. If a chosen display format makes a value too long to fit into a cell, asterisk marks are placed across that cell. The original values are remembered. To display the value again, you must alter the column width or change the format.

To set a format, select Format from the Range menu (/RF). Choose the letter of the format and any necessary information. Then, specify the range to be formatted using one of the methods described earlier. The format options are described below.

Currency:
Choose Currency (C). Values will be preceded by the dollar symbol. Negative values are enclosed by parentheses. A comma is inserted after every third digit to the left of the decimal point. Choose the number of digits you want to round off to after the decimal point by entering any number between 0 and 15. Press [Return].

Date:
Choose (D). Any integers between 1 and 73050 are considered to be "serial" versions of dates and are translated to a normal date format. The date format is usually used with date arithmetic (see "Date Arithmetic" in the chapter, "Building Formulas using Operators and Functions"). You have three options for the way dates are displayed. The day and the year are always displayed numerically while the month is displayed as abbreviated text and uses three letters (for example; "05-JAN-85"). Your options are: 1) Day-Month-Year, 2) Day-Month and 3) Month-Year. Choose the number of your option and press [Return].

Fixed:
Choose Fixed (F). This allows you to round off all values to a specified number of decimal places. Enter the number of decimal places you want each value rounded off to (type in a number between 0 and 15). Press [Return].

General:
Choose General (G). This is the initial global defaulted value. In this format, numbers are displayed as entered, except that where numbers are too large to be displayed, they are displayed in exponential notation. Otherwise, values are displayed as they are entered.

Percent:
Choose Percent (P). A percent symbol precedes each value in the range. Enter the number of digits (0 to 15) you want values rounded off to after a decimal point.

+/-:
Choose +/- (+). The values of your range will be displayed as plus or minus symbols. Plus is used to display positive integers. The value of the integer equals the number of + symbols used. If a value is 5, 5 + symbols are displayed in its cell. Negative integers are displayed as - symbols. The value 0 is displayed as ".".

Reset:
Select Reset (R). The Reset command is used to counter the effect of the Range Format command. Range Format Reset returns a range to the global format (as set by the Worksheet Global Format command).

Range Label-prefix

The Range Label-prefix command is used to change the display of labels in a range so that they are aligned to the right or left of the cell or centered. Any labels you wish to add to the range at a later time will conform to the global standards rather than to the range's standards. If you wish to change the position of the added labels in their cells, you must do so individually, while you are in the Edit Mode.

The Range Label-prefix command is similar to the Worksheet Label-prefix command. The major difference between the two is that the effect of the Worksheet command is global while the Range command is only effective in the specified range. Where both are used, the Range command has precedence over the Worksheet command.

To use this command, first select it choosing by choosing Label-prefix from the Range menu (/RL). Choose right, left or centered alignment by typing in the first letter: R, L or C. Now, specify a range and enter it. VIP Professional will do the rest of the work for you and your range labels will be formatted according to plan.

Range Name

VIP allows you to give a specific name to each range that you create. This can be particularly useful if you have certain frequently used ranges. Naming a range makes it more personal and, therefore, easier to remember. For each worksheet you have created, VIP

Professional allows you to keep a list of range names to designate ranges in it. These range names can be saved and retrieved with most file commands. However, the File Combine command does not allow you to keep range names when you combine two different worksheets. This prevents possible conflicts in named ranges.

When VIP Professional prompts you for a range to be processed, you can use a range name. To have a list of the current worksheet range names displayed, use the Name function [Function 3]. To select a range name in response to a prompt, either point to it with your mouse or arrow keys or type in the range name. Press [Return].

There are three commands which relate specifically to range names: the Range Name Create command, the Range Name Delete command and the Range Name Reset command. In addition, the Range Name Label command is a special command which is used to name single-celled ranges.

Range Name Create

The Range Name Create command is used to give a name to a certain range. Range names make it easier to view or use certain ranges in command procedures. Once a range has been named, its definition (the borders of a range as defined by its two endpoints) can be revised at a later date without changing its name by changing the position of its start and end cells.

To name a range, select Create from the Range Name menu (/RNC). In reply to the prompt for a new range name, type one of your choice and press [Return].

Like file names, range names can be typed in upper- or lowercase letters. VIP Professional displays all letters in uppercase. Range names can be up to 15 characters long. We suggest that you do not use space characters or the +, -, *, /, and ^ characters. This is to avoid similarities with formulas, commands and labels since that may cause confusion for the program. For the same reason, we advise you not to use range names that look like cell addresses.

The last step to creating a range name is specifying the range. In response to a prompt, specify the range using one of the methods (mouse, arrow keys or typing) described in the beginning of the chapter. Press [Return] to enter it.

To view a named range, type the range name or choose it from the range name list (which can be called up with the Name function [Function 3]. Press [Return]. To return to the Ready Mode, press [Return] without pointing to any of the names.

To redefine the borders of a named range, select the Range Name Create command. The existing range names for the current worksheet are called up with Range Name Create. Choose the name of the range you want by highlighting it with your mouse or arrow keys, or by typing it in. Press [Return]. Now specify the new range with your mouse, arrow

keys or by typing. Press [Return]. All formulas with cell references which referred to a range by that name will be updated to reflect the changes made.

Range Name Delete

The Range Name Delete command is used to delete range names that are no longer needed. This means that the deleted range name will not appear on the range name menu, nor will it be used to refer to a range anymore. However, the cell contents of the range are unaffected. Formulas with cell references which previously referred to the range by name now refer to the range by using cell addresses.

To use the Range Name Delete command, choose Delete from the Range Name menu (/RND). Choose the name you want deleted, either by typing it out or by choosing it from the list which is automatically displayed. Press [Return] to enter it.

Range Name Reset

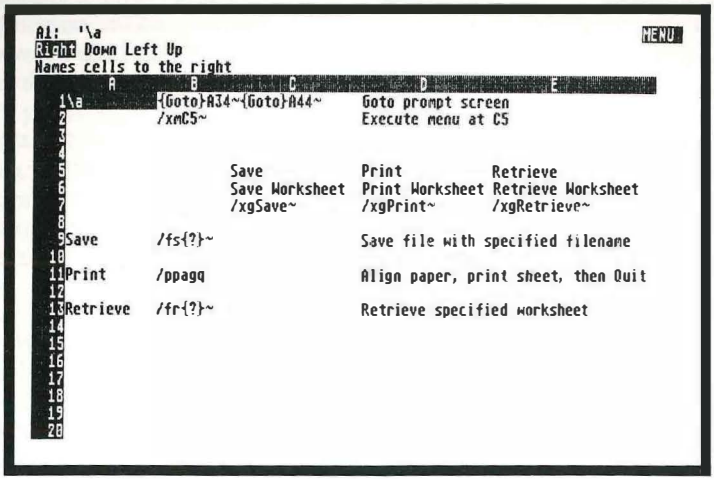
The Range Name Reset command is used only when you wish to delete all range names from your worksheet.

To select the Range Name Reset command, first choose Reset from the Range Name menu (/RNR). All range names are deleted from the Range Name menu. Ranges can no longer be referred to by name. All formulas which previously referenced cells by range name now use cell addresses.

Range Name Label

The Range Name Label command is used to create a string of one-celled, named ranges out of key value cells. Sometimes, you will find that it is easier to refer to the names of key values rather than their cell coordinates or the values themselves.

Certain key formulas can also be single-celled, named ranges. This can be done with the Range Name Create command. However, when there are several cells in a row that contain key formulas and each has an identifying label located directly above, below, to the left or to the right, it may be easier to use the Range Name Label command to name all the ranges at once.



Range Name Label Command Used to Name a Column of Ranges in a Macro

The names of these ranges are derived from the string of labels. The labels must either be all to the left, all to the right, all below or all above the value cells.

To use the Range Name Label command, first position the cell indicator on one end of the string of label cells you want to use. Select the command by choosing Label from the Range Name menu (/RNL). Specify whether you want to name the value cells to the right, left, up or down of the label cells (R, L, U or D). Specify the range of labels you want used. Remember, as with all range names, VIP Professional can only use the first 15 characters of the label to give the range its name.

Range Justify

There will be times when you wish to add sentences or even paragraphs of explanatory text to your worksheet. VIP Professional allows you to do this by using the Label mode for entering your text. Labels are allowed more characters than can be contained in one cell. A label which contains more letters then can be displayed within a cell will automatically continue through the next cells to the right and are only interrupted by cells containing data.

Labels can be written as ordinary text, with [Space] and punctuation characters. A series of long labels, all beginning in the same column can be written as a paragraph.

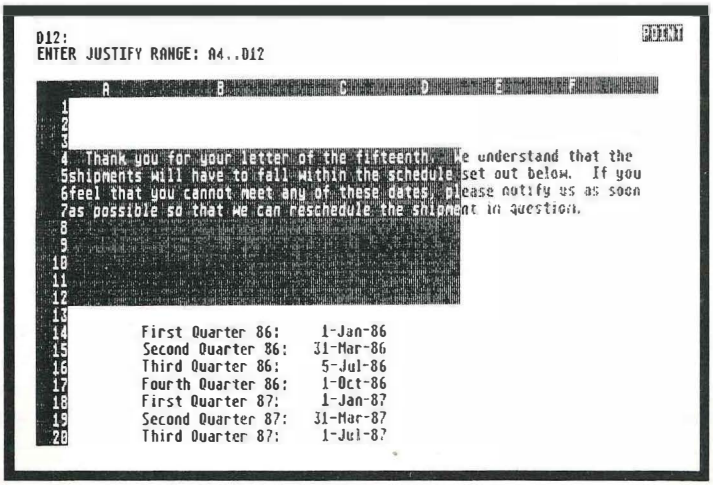
Margins can be set or changed for these labels. The left margin is set by the cell in which the labels are begun. With the Range Justify command, you can change the right margin of a long label (or consecutive set of labels) to a specified ragged-right margin of your own.

Range Justify reformats your margins to the length you specify by shortening or lengthening each row individually. All words which extend beyond the margin you set are carried down to the row below. This way of breaking sentences up between words to suit margin lengths is similar to the word wrap-around feature found in many text processors.

To use the Range Justify command, place the cell indicator over the first character in the first label of your range. Now select the Justify command from the Range menu (/RJ). Move the cell indicator across the row until you reach the desired margin length. Press [Return]. The first label, and all labels which follow it in an unbroken order (that is, until the first non-label cell), will be reformatted according to the margin length you specified.

If you move the margins closer together, resulting in thinner paragraphs, more rows are used to accomodate all the labels. If you move the margins further apart for wider paragraphs, less rows are needed. Either way, VIP Professional automatically adjusts the rest of your worksheet to make room for these changes. If more rows are needed by the labels as a result of closer margins, the rest of the worksheet is moved down an equivalent number of rows. If fewer rows are needed because of wider margins, the rest of the worksheet is moved up an equivalent number of rows.

To stop automatic adjustment, you can specify a depth as well as a width when you use Range Justify. To do this, follow the procedure described above, but, right after you move the cell indicator across the row to the desired margin setting, move it straight downward until it is positioned over the last cell you want included in your range. Press [Return].



Specifying Depth and Width with Range Justify

If the series of labels fits into the range you specified, then the only area of your worksheet affected is the area you specified as your range. If the series of labels overflows

the range parameters, you will receive an error message letting you know that the range has been filled. After you remove the message (by pressing [Return] or clicking OK), you will see that the area which could not fit into the specified range continues below the range and is not set at the margin you specified with the Range Justify command. There may even be times when you lose parts of your longer paragraphs.

When you add or delete words from labels after you have you used the Range Justify command, you will notice that the label is not automatically adjusted to fit the specified margin length. If you want to retain the margin setting, you must use the Range Justify command again.

Range Protect and Unprotect

The Range Protect and Range Unprotect commands are used only in connection with the Worksheet Global Protection commands (see the section on global protection in the chapter, "Worksheet Commands"). In the ranges where they are used, the Range commands override the Worksheet commands. This is particularly effective since it allows you to have both protected and unprotected cells in your worksheet. Range protection of cells is used when you wish to keep certain areas (cell ranges) free from editing changes or other accidental changes. They cannot be entered (that is, the Value, Label, or Edit modes cannot be used in these cells) and, therefore, no editing changes can be made if you invoke protection.

Range Protect:

The Range Protect command may only be used when Worksheet Global Protection has been enabled (/WGPE). It is usually used within a larger range which has been left unprotected or with a range used by the Range Input command (discussed in the next section).

To use the Range Protect command, choose Protect from the Range menu (/RP). Specify a range and enter it. VIP Professional will set up protection in the range.

Range Unprotect:

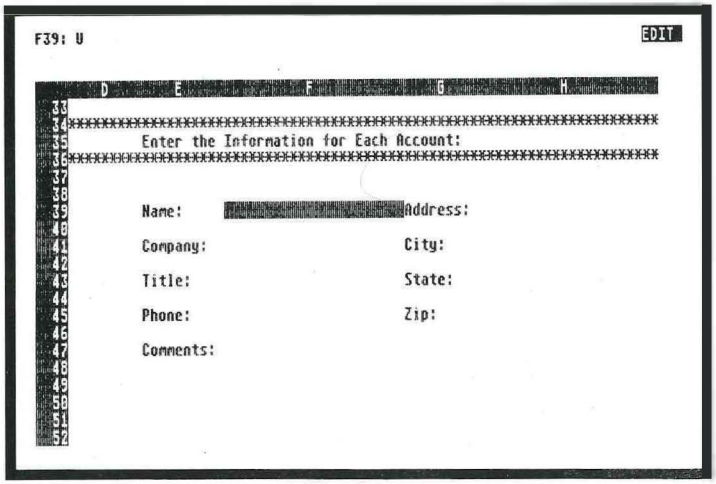
To use the Range Unprotect command, choose Unprotect from the Range menu (/RU). Then specify a range and enter it. VIP Professional will unprotect that range.

The Range Protect and Unprotect commands can be used to counteract one another. If you have a range which you previously had protected, you may unprotect it using the appropriate command, and vice versa.

Range Input

The Range Input command is often used as an extension of the Range Protect command described in the last section. With the Range Protect command, you can specify cells you do not wish changed. You cannot enter information in protected cells, but you can still move over them with your cell indicator. With the Range Input command, you can set your worksheet up so that only the cells you want changed can be entered or reached in any way. Protected cells can therefore be doubly protected by this and the Range Protect commands. The Range Input command can also be used without the Range Protect command.

For example, before using Range Input, you can create half-finished forms which only need a few pieces of data entered. Then use the Worksheet Global Protection command to protect your data and the Range Unprotect and Range Input commands to limit additional data entry to the desired areas. This data can be entered by you or by someone who has little experience with using VIP Professional. Since the data already entered is doubly protected there is little chance that anyone can damage it.



Using Range Input with Range Unprotect

The Range Input command is also easily used with keyboard macros to create such things as repetitive letters or forms. With macros, Range Input is used to indicate those areas where the forms require different entries. For example, in a repetitive letter, Range Input would be used to indicate the area which is filled in by the name.

To use the Range Input command, first make sure the target cells are part of an unprotected range. To do this, use the Range Unprotect command discussed in the previous section. If you forget to leave Range Input cells unprotected, your computer will beep at

you and display an error message when you use this command. Next, select the Input command from the Range menu (/RI). Specify the input range and enter it.

When you use the Range Input command, the selected range is displayed in the upper left-hand corner of the display. You will notice that you may use your movement keys or your mouse to move in the Range Input cells only. All non-Range Input cells are bypassed when you move around in the worksheet.

While Range Input is in effect, you can use the Help function [Function 1] and the Calculation function [Function 9]. For editing, you may use the Edit function [Function 2]. In the ready mode, [Backspace] is used to erase the character preceding your cell indicator. To cancel an entry, press [Escape] once. All other functions and types of commands are inactive.

If you press [Escape] or [Return] without first typing or editing an entry (that is, in the Ready mode), the Range Input command is ended. VIP Professional returns you to where you were in the worksheet before you issued the Range Input command. Both the worksheet window and the cell indicator are returned to their original positions.

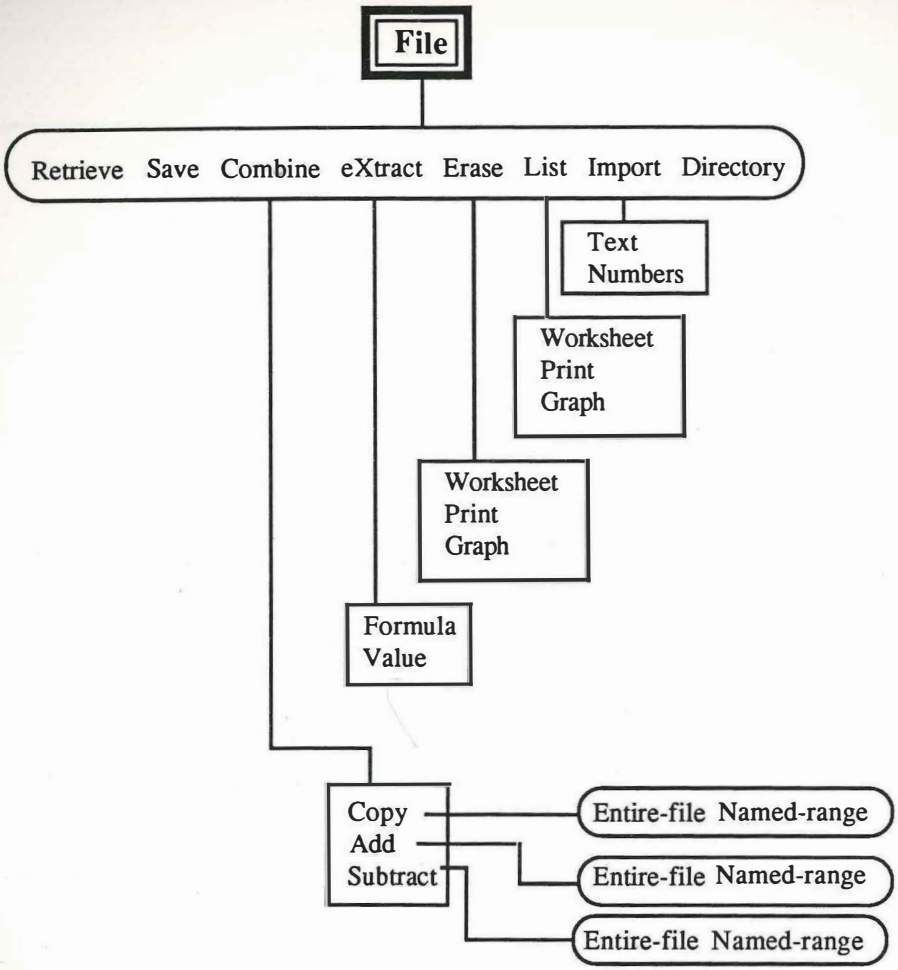
Range Erase

The Range Erase command is used to erase the contents of a selected range. Just as the Worksheet Erase command erases the contents of an entire worksheet (including both commands and data), the Range Erase command erases a lesser area. The Range Erase command does not require confirmation before erasing. Therefore, it should be used with care.

To use the Range Erase command, choose Erase from the Range menu (/RE). In response to a prompt for a range, select and enter the range you want erased and press [Return]. VIP Professional erases the contents of that range once you've entered it.

File Commands

File Retrieve
File Save
File Combine
File eXtract
File Erase
File List
File Import
File Directory


File
Retrieve Save Combine eXtract Erase List Import Directory
Text
Numbers
Worksheet
Print
Graph
Worksheet
Print
Graph
Formula
Value
Copy
Add
Subtract
Entire-file Named-range
Entire-file Named-range
Entire-file Named-range

File Commands

Introduction

File commands are used to store your worksheets, graphs and print-ready copy separately from one another. They are also used to interact between the different stored areas so that you can do such things as combining parts of files.

The files of VIP Professional are similar to files used in an office. Each file stores a different subject and needs to be pulled out (or retrieved) once it has been filed (or saved) if you want to look at it again. Instead of saving the files in a cabinet, you will be saving the files on formatted data disks.

The contents of your files, worksheets, graphs and soft copy for printing, are created in your computer's main memory. However, the files themselves are stored on data disks. Every time you retrieve a file, you are actually copying all the information in that file of that disk back into your computer's current memory so that you can work with it.

With VIP Professional, you only work on one worksheet at a time. When you are finished working on it or when you want to turn the computer off, you need to save your work to a disk. The number of files you can save to one disk is limited by the amount of memory available on the disk. But since you can use as many data disks as you want, the total number of files you save is virtually unlimited. Files are also grouped into folders or, as they are also called, directories. Each folder may be used to contain several files pertaining to one particular subject. The disk drive and directory to which you save a file is initially controlled by the Worksheet Global Default Directory command. It can also be specified by using a disk prefix or by using the File Directory command.

When you make a mistake in saving files or in retrieving them from a disk, your computer may send you an error message if it has problems "reading" from or "writing" to your disk. This means that, somehow, information is not being passed correctly to and from the computer. Since VIP Professional is actually a kind of master file itself, you may sometimes get this type of error message when you are starting up the program and there is a problem.

Each file must be stored under its own file name. Then, when the computer is asked to retrieve a file, it can find the right one from all the ones you have in the directory on the disk in the correct disk drive. No two files on a single disk can have the same name. If you try to give the same name twice, VIP Professional "overwrites" the first file with the second file. Overwriting occurs when the contents of the first file are erased and replaced with the contents of the second file. Fortunately, VIP will send you a prompt first before overwriting.

Even though you can save two files with the same name to different disks, it is not advisable. Similarly named files can cause confusion when you try to remember what their contents are.

Worksheet file names can be up to eight characters long. The characters you may use are those from A - Z, 0 - 9, and —. Characters other than these are considered illegal. Your computer will send you an error message when you try to use them for a file name. If you use characters from the alphabet, VIP Professional recognizes lower- and uppercase letters as being alike.

Example: "ACCTS3" is acceptable as a file name. "ACCOUNTING" is not acceptable because it is too long. "ACCTS 3" is also not acceptable because file names may not contain [Space] characters.

Types of Files

There are three different types of files. Each one contains a different kind of information. The three types are: worksheet, graph and print. Worksheet files store raw worksheet data. Graph files are used for storing the graphs which you create. They are stored separately from worksheet files because they are created differently and because the procedure for printing them is different from printing worksheet files. Print files use the contents of worksheet files, but these contents are the electronic versions of printouts. To retrieve these files, you need a standard ASCII text processor. Print files usually serve as the bridge between importing and exporting standard files from other programs.

As you can see from the File List and File Directory commands discussed in this chapter, the different types of files are not grouped together on a disk. The program gives each data disk three different lists, one for each type of file.

The three types of files are distinguishable by their file name extensions. File name extensions are preceded by a period (".") and added to the file names. The file name extensions are: "wks" for worksheet, "gph" for graph and "prn" for print. No [Space] characters are used between the file name and its extension. Upper and lowercase letters are considered alike. For example, a graph file named "ACCTS85" would be stored like this: "ACCTS85.gph".

File name extensions are used when you first create a file, when you move from one directory to another or when a worksheet file becomes a print file. Most often, VIP Professional adds the file name extension automatically (for instance, when you save a print file). At other times, such as when you move from one type of file to another, you need to add the file name extension or use the File List command.

File Save

The File Save command is used to save a worksheet and all its settings from the computer to a disk. This command is particularly important because it is the only thing that stands between you and complete, irretrievable loss of your worksheet once it leaves the computer's main memory. In cases of power outages or incorrect commands, your computer loses track of what is in its memory and your worksheet is lost. Of course, if you quit your worksheet or turn off the computer the same thing happens. Because of this, it is important to save your worksheet.

There are so many ways you can accidentally or intentionally erase a file. We suggest that you save your worksheet frequently, perhaps even as often as every 15 minutes! Each time you save your file, you may return to it to update or add information. When you save it again, you use the same file name.

To use File Save, first select the Save command from the File menu (/FS). Type in the file name you wish to use or choose an existing file name from the file name catalog (a list of existing file names which appears with the command). You may use your arrow keys or your mouse to move through the list. If you type in or point to an already existing file name, a computer prompt appears to ask you whether to replace the old file or not. If you choose Replace (R), the computer erases the older version of your file and stores the new one. If you decide you'd rather keep the older version, choose Cancel (C). The older version remains saved, but the newer one won't be. If you still want to save the newer version, you will have to do so under a different name.

When you save your worksheet, notice that there is no simple correlation between the amount of memory used when it is created on the computer and the amount of memory used when it is saved in a file.

If there is not enough memory space left on your disk to store the worksheet, your computer sends you a prompt letting you know that the disk is full. In this case, simply insert another data disk (making sure that it is formatted) and repeat the File Save command.

In rare cases, you may want to save a worksheet which holds more information than can be contained on a data disk. If this happens, separate the information by using the File eXtract command (discussed later in this chapter) and place the information on different disks. To retrieve the information on your computer, use the File Combine command (also discussed later).

File List

The File List command is used to display a list of file names of a particular type from the directory you are currently using, along with the amount of memory used by each file and the amount of total memory you have left on that disk. You can use this command at

almost any stage of your work. Once you have finished viewing the list of file names, any key takes you back to where you were on the worksheet.

To use the File List command, first select the List command from the File menu (/FL). Then specify the type of file you want to look up by choosing the correct file type: Worksheet (W), Print (P) or Graph (G). If there are no files of the type you requested, the computer sends you an error message. When this happens, press [Return] to go back to your worksheet.

File Directory

The File Directory command is used to set the current disk drive and the directory (or folder). This means that the computer sends the file for storage to a specific directory (folder) on a specific disk. The current disk drive is initially set by the Worksheet Global Default Directory command. Usually the program disk is kept in the first disk drive (A) and the data disks are kept in the second disk drive (B). Hard disks are labelled, "C".

To use the File Directory command, first select Directory from the File menu (/FD). The current disk drive and directory setting will be displayed. If you wish to retain it, press [Return]. To change the current file directory, type the letter of the disk drive (A - C), a colon and the name of the directory preceded by a backslash. All your files will now be saved to that disk in that disk drive.

Example: B:\ACCTS85

Using File Directory is recommended, but if you want to change the disk drive setting for just one file, you can use the disk prefix (one of the letters from A - C). For example, if you want to retrieve a directory named "ACCTS85" from a disk in drive B and your current disk setting happens to be drive A (A), type "B:\ACCTS85" and press [Return]. Then, when you are finished with that file, you can reset the disk setting to the one you had before by using the same method.

File Retrieve

The File Retrieve command is used to move information from a file stored on a disk to the computer's memory. The computer will only search for the file in the current directory (specified by the Worksheet Global Default command or the File Directory command).

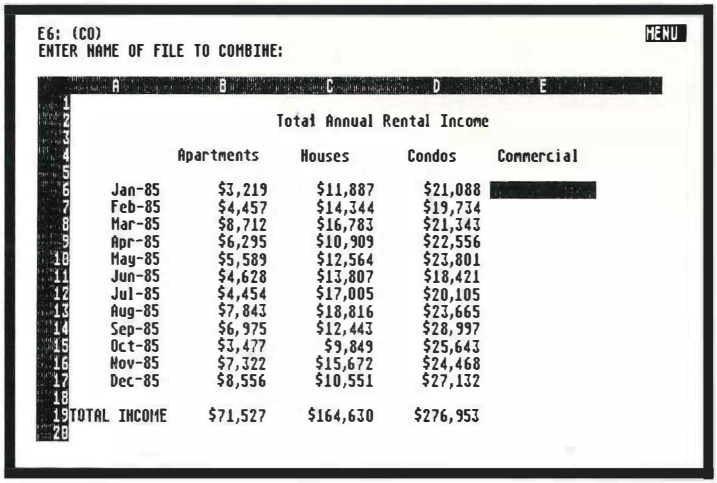
If you are working on a worksheet, make sure you save it before you retrieve another or you will lose it. The computer automatically erases whatever is in the main memory before it retrieves a file for you.

To use the File Retrieve command, first select Retrieve from the File menu (/FR). Indicate which file you want retrieved by typing in the name or choosing it from the file catalog displayed. Press [Return] to enter it.

File Combine

The File Combine command is used to add part or all of a saved worksheet to the worksheet you are currently using. The command does not erase the worksheet you are using and only affects the areas both worksheets have in common. The worksheets are matched cell for cell and it is only those cells which have the same coordinates, or cell addresses, which are used. How the current worksheet is affected by File Combine depends on one of three options you choose when you issue the command.

The first option you have is to copy entries from the saved worksheet to the current worksheet. When you choose the Copy option, each entry from the area of the saved worksheet replaces the matching entry of the current worksheet.



Copying Worksheet Cell Contents with File Combine

Another option is Add. Entries from the saved worksheet which match the position of those from the current worksheet are added to those from the current worksheet. Only numbers and formula values from the saved worksheet are used during this File Combine command. Labels and empty cells from the saved worksheet are ignored. Empty cells from the current worksheet take the added values of the saved worksheet's cells.

The last option, Subtract, is similar to adding. The only difference lies in the operation. Numbers and formula values from the saved worksheet are subtracted—not added—to the current worksheet.

To use the File Combine command, place the cell pointer at the upper left corner of the area in your current worksheet where you want changes to be made. Select the Combine command from the File menu (/FC). Now, select a method of combining. Choose Copy (C), Add (A), or Subtract (S). Choose to use the entire saved worksheet (E) or a named range (N). If you chose a named range, type in the name of the range. If you chose an entire file, specify the name of the worksheet by typing it or by pointing to it on the file catalog (displayed automatically) and pressing [Return]. Unless you use a disk prefix, VIP Professional will look for the worksheet file in the disk you are currently using.

It might be a good idea to save the current worksheet and to make a copy of the saved worksheet before you execute the command if you don't have much experience with this command or are unsure of what its effect might be. This way you will still have a copy of your work. The File Combine command cannot be rescinded once it is issued.

File eXtract

The File eXtract command is used to save a range or, as an option, to save currently displayed formula values (rather than the formulas themselves) of a range from a worksheet into a separate worksheet file. The command is often used to save part of a worksheet or, when used with the File Combine command (discussed previously), to save part of one worksheet to another worksheet.

To use the File eXtract command, select the eXtract command from the File menu (/FX). Choose to save formulas (F) or only the current values of formulas (V). Choose a file name for the extracted portion of your worksheet. If you choose a file name already in existence or the file name of the current worksheet, the computer will ask if you want to replace the contents of the existing file (R) or to cancel the command (C). Cancel takes you to where you were before you selected the command. If you choose Replace, the saved worksheet will be overwritten by the extracted portion. Specify the range to be extracted by using your movement keys or your mouse. Press [Return] to enter it.

A new worksheet file containing the extracted range is now created with the name you specified. All the settings which are a part of that section of the worksheet are also saved.

File Import

The File Import command is used to copy numbers and/or labels from a file which wasn't created on VIP Professional (but from another spreadsheet or computer) to a worksheet. With this command, you can import just text or numbers and labels and superimpose this

new data at a specified spot in your worksheet. "Domestic" equivalents to the File Import command would be the File Retrieve and File Combine commands.

The File Import command processes most standard-format print files from programs other than VIP Professional. Standard-format files are files which do not use characters or formats which are peculiar to the word processor or computer it was created on.

Usually, all that is necessary to create a print file from an incoming file (which is not already a print file) is renaming it with a ".prn" file name extension. For this, the GEM Desktop can be used. The Atari user's manual has instructions for renaming files.

After making sure that the file you are importing has a ".PRN" file name extension, you can use the File Import command. First, position the cell indicator over the upper left cell of the worksheet area you want to use. Select the Import command from the File menu (/FI). Decide whether you want to specify Text (T) or Numbers (N). If you decide on numbers, you must enclose all the labels of the imported file in quotation marks. This can be done using the source program or a text editor. Then, type the name of the print file to be imported. Press [Return].

With text, VIP Professional changes each line of text into a long label, moving down line by line. A paragraph is really a series of long labels, all starting in the same column. The labels are begun at the spot specified by the position of the cell indicator. The length of each label depends on the length of each line of the imported text. Each cell of the VIP Professional worksheet can contain as many as 240 characters (although only those which fit in the worksheet window will be displayed).

With numbers, VIP Professional searches out all numerical values and sets of characters (labels) enclosed by quotes. These numbers and characters are transferred to the VIP Professional worksheet line-by-line. The worksheet matches the print file's lines with its rows. The numbers and labels are entered successively; with each number/label following the last one a cell to the right. The labels enclosed by quotes are transferred to the VIP Professional worksheet as left-aligned labels.

With the File Import command, the imported data replaces worksheet cell contents in the area in which it is entered. However, if there are blank lines in the imported print file, the worksheet moves its contents down a matching number of rows from the place where the blank lines are inserted.

It is important to make sure that when you import text, it has been standardized. With VIP Professional, you could still try to import non-standardized text, but the results are unpredictable and can be quite surprising.

File Erase

The File Erase command is used to delete a file from a disk. It is most often used to remove files one at a time from a disk so that there is more room for storage on the disk. Care must be taken when exercising this command because once a file has been erased, it cannot be retrieved.

To use the File Erase command, first select the Erase command from the File menu (/FE). Now choose which type of file you wish to erase: Worksheet (W), Graph (G) or Print (P). Indicate the file to be deleted by typing its name or by pointing to it on the file catalog. The catalog is displayed automatically with this command. Press [Return]. The computer will offer you options asking you to confirm or cancel the deletion. If you choose Yes (Y), the file you specified is erased. If you choose No (N), you are returned to your previous position and the command is cancelled.

To use the File Erase command for deleting more than one file at a time, you have two special characters which you can use. The question mark ("?") and the asterisk ("*") are used along with file name characters to produce a type of file name pattern which erases all files which match its specifications.

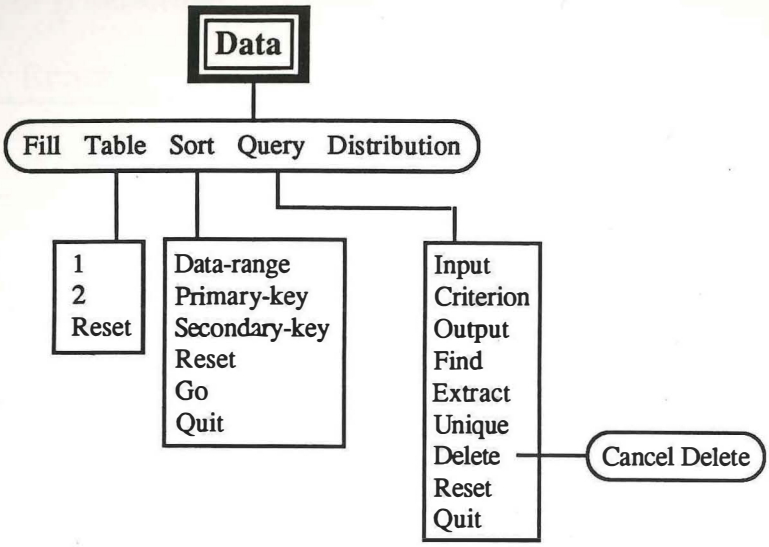
The procedure for using the File Erase command is the same as usual with these additional characters, the only difference being that with them, more than one file can be deleted. "?" matches any single character which is positioned in the same place of the file name as it is. For example, if you type "RCVBL?" as the file name when you issue the File Erase command, files such as "RCVBL1" or "RCVBL2" would be deleted. However, a file with the name of "RCVBL12" would not be deleted since the question mark allows only one optional character in its place.

The "*" is used to end a string of characters. It matches all characters in a file name from where it is placed to the end of the file name. If you type "ACCT*" as a file name when you issue File Erase, files with names such as "ACCTS", "ACCTG" or "ACCTG1" would be deleted. A file with the name "ACTSLTR" would not be deleted because its characters do not conform with those specified before the asterisk.

The "*" character can be used alone when the File Erase command is issued. When this is the case, all files in the current directory are erased.

Data Commands

Data Fill
Data Table
Data Sort
Data Query
Data Distribution


Data
Fill Table Sort Query Distribution
1
2
Reset
Data-range
Primary-key
Secondary-key
Reset
Go
Quit
Input
Criterion
Output
Find
Extract
Unique
Delete
Reset
Quit
Cancel Delete

Data Commands

Introduction

Data commands are powerful tools used for database management aspects of VIP Professional. They maintain records in the order that you decide as well as assisting in financial planning and numeric analysis. Once you have created your database, you can sort part or all of it, make queries to find significant information, and perform statistical analysis. Other special database commands allow you to create tables for analyzing different possibilities and find the frequency distribution of portions of your database.

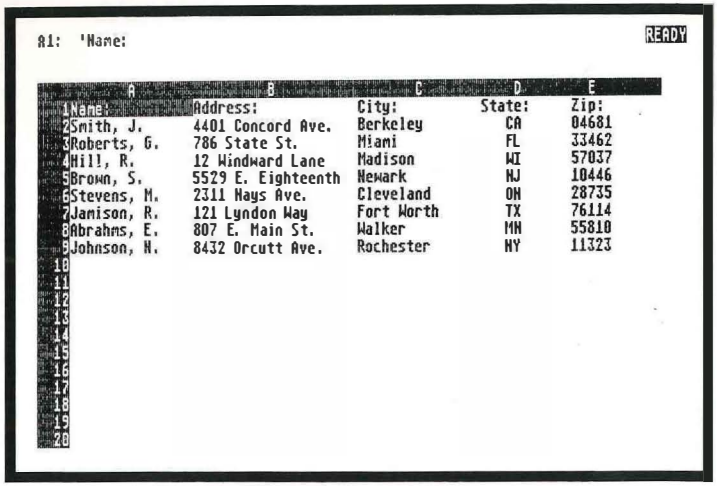
VIP Professional's Data commands follow as a natural extension of the program's many capabilities. The Data menu is fully integrated with the other menus and uses commands from them, such as Worksheet and Range commands, to design and use a database. These, plus the specific Data commands, combine to offer you extensive data processing capabilities.

Creating Databases

A database is a set of records pertaining to a main subject. Databases gather information from a variety of sources. Each source is considered a record. All the information (or data) in the database is organized into groupings of similar information. Each group represents a different facet of the data records. These facets are the fields.

For example, say that you worked in a company which employed twenty people. You need to keep track of their names, addresses and telephone numbers. The best way to do this is to make a record of each employee. This gives you 20 records. Then, organize all the records into fields. You might end up with seven different fields in this order: last name, first name, street number and street, city, state, zip code and telephone number.

A database uses the same column and row organization that is used by the worksheet itself. Formulas, labels and values are also entered and used similarly in a database. The biggest difference between a database and other worksheets is that the columns and rows of the spreadsheet are used to organize the fields and records of the database. Each cell of a database (excluding the top row which is used only for field names) is part of both a field and a record.



The Format of a Database

Columns are used to organize the fields. The first row of the database uses labels called field names which head and describe the fields assigned to the columns/fields below. No two fields in a database may have the same field name.

All field names must be labels, so if you enter a number to be used as a field name, make sure you precede it with a label prefix. [Space] characters should be avoided when typing in field names. Even if they are not apparent, the computer remembers that they are there. This may lead to undesirable results or an error message if you do not remember to use them in commands at a later time.

The following rows of the database (the second, third and so on) are used as records. Records are entered in a database in the order of their fields. Each field of a record is placed in a column which is headed by an identifying field name. Records usually consist of several fields. Each contains a piece of data which makes up one element of the record.

As we said earlier, each piece of data that you enter in your database is considered part of both a field and a record. If this concept seems a bit confusing, a good way to clarify it is to compare a piece of data with a worksheet cell. A cell is part of both a column (a field for a piece of data in a database) and a row (a record for a piece of data in a database).

VIP Professional databases are easy to use partly because they incorporate commands and features that you are already familiar with from other aspects of the program. For example, by using Worksheet Insert commands, you can insert rows and columns for use as extra records and fields. Range Format and Range Label commands can determine format and alignment. The Copy and Move commands are extremely useful. You can use the Edit

mode to correct errors made in data entries. Formulas and functions also have a place in database construction and management.

In addition to these and many other familiar commands and features, VIP Professional has the Data commands to deal with specific database operations. The five main Data commands are: Data Sort, Data Query, Data Table, Data Fill and Data Distribution.

Data Sort

The Data Sort command allows you to change the order of database records or any other series of data in your worksheet. For example, you can use it to alphabetize a set of records by last name. This command only changes the order of records; the order of fields in the database is not affected by it.

When you select the Sort command from the Data menu (/DS), you call up a menu of subsidiary commands. These commands are: Data-Range, Primary-key, Secondary-key, Reset, Go and Quit. Sorting a database requires the following steps. First, you must specify the range to be sorted with the Data Range command. Next, you have to set the field which is to be sorted using the Primary-key commnand. The third step, which is optional, is to set a second field which serves to further sort any duplicates in the primary field. Finally, you select Go to actually sort your database.

Before going on to discuss each of these steps, it is necessary to explain two aspects of the sort feature which you should be aware of. The first aspect has to do with the effect of sorting a database. Once you have used the Data Sort command, there is usually no way to restore the order of the records, as the Professional does not recall the original order. To avoid such a problem, you may create an extra field for numbering the records in sequence before you issue the command. That way, you can always resort your database using this field as the primary field when you are ready to return to the original order. When you are numbering each record, you may do it manually if there are just a few records in the database, or you may use the Data Fill command (discussed later in the chapter) if there are more records.

The other aspect has to do with the relation of formulas to your database. The Data Sort command changes the position of records and this can affect entries which contain formulas with cell references. (Using cell references is discussed in the chapter, "Building Formulas Using Operators and Functions".) However, there are some general rules pertaining to the use of formula references in database entries where the Data Sort command is used: All references to cells outside the range to be sorted should be absolute. Within the range, references to cells in the same records can be left relative, especially in regard to column number. References to cells in different rows of a range should not be used.

Data-Range

The range, or portion of the records, which you want to sort must be specified first. You may choose to sort the entire database or just one section of it. When you specify the range, do not include field names located in the top row or they will also be sorted.

First, select the Data-Range command from the Data Sort menu (D). Specify and enter the range. Once you have entered a range for the Data Sort command, VIP Professional remembers it. The next time you use this command, VIP Professional will automatically display it when you choose the Data-Range command from the submenu. If you use the Data Sort command several times, the most recently used range will be displayed. If you accept this, simply press [Return]. If not, press [Escape] and respecify the range.

Primary-key

This is the second mandatory command from the submenu. It chooses the primary-key field and, through a prompt, the order (highest to lowest or lowest to highest) in which the primary-key field will be sorted. The primary-key field and the way it is sorted determines the order of the records.

To select the command, choose Primary-key from the Data Sort menu (P). Use your mouse or arrow keys to move the cell indicator anywhere in the column of the field that you want as the primary-key field and press [Return].

Now decide on the order of the primary-key field. You can choose ascending (A) or descending (D). Ascending puts records in order from the lowest to highest number or letter. Descending puts them in reverse order. The order is decided according to the following rules of precedence:

1. Blank cells.

2. Label cells. The alignment prefixes are ignored, but the rest of the labels' characters are used to put the labels into ASCII order. ASCII is a standard computer code which assigns a number to each character available on the keyboard. For a complete list of the ASCII code, please see Appendix C.

3. All other cells in the order of their number or formula value.

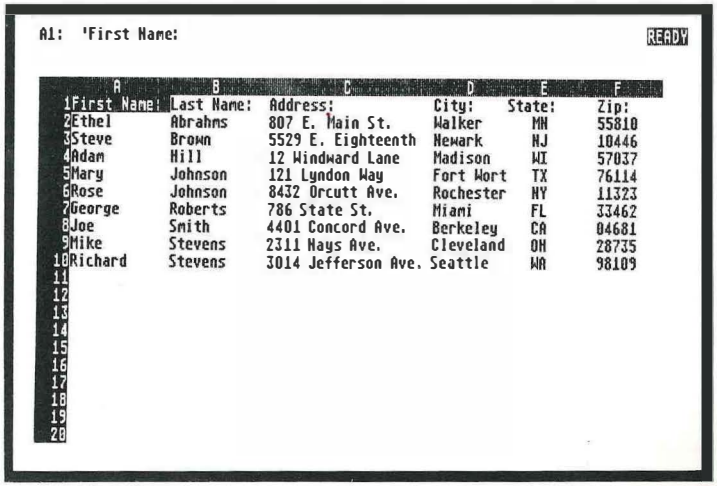
If you have used the Primary-key command before, VIP Professional remembers your most recent choices and you will not have to respecify the primary-key field again unless you want to change your choices. Press [Return] to accept the choices displayed in response to the Primary-key command selection. To change them, specify the primary key field and sorting order of your choice. Do not use [Escape]. Professional will display and use your most recent selections.

Secondary-key

If there is more than one record in the primary field with the same primary-key field, the order of those records after the sort will be unpredictable since records with identical primary-key fields are considered equal. To help with this problem, the Secondary-key command is provided. It is used to sort the order of records with identical primary-key fields. For instance, if you want to sort a list of names and addresses by last name in alphabetical order, you may decide to sort the list further by sorting the records of those who have the same last name by also sorting the first names. To do this, you would choose the last-name field as primary key and the first-name field as secondary key.

After selecting the Secondary-key command from the Data Sort menu (S), use this command as you did the Primary-key command. The sorting order is decided the same as it is for the primary-key command.

The next time you use Data Sort, the secondary-key choices you made will be displayed if you use the Secondary-key command. Accept it or revise it as you would the Primary-key command.



	A	B	C	D	E	F
1	First Name:	Last Name:	Address:	City:	State:	Zip:
2	Ethel	Abrahms	807 E. Main St.	Walker	MN	55810
3	Steve	Brown	5529 E. Eighteenth	Newark	NJ	10446
4	Adam	Hill	12 Windward Lane	Madison	WI	57037
5	Mary	Johnson	121 Lyndon Way	Fort Wort	TX	76114
6	Rose	Johnson	8432 Orcutt Ave.	Rochester	NY	11323
7	George	Roberts	786 State St.	Miami	FL	33462
8	Joe	Smith	4401 Concord Ave.	Berkeley	CA	04681
9	Mike	Stevens	2311 Hays Ave.	Cleveland	OH	28735
10	Richard	Stevens	3014 Jefferson Ave.	Seattle	WA	98109
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

A Database Sorted by Last Name (as Primary Key) and by First Name (as Secondary Key)

Reset

The Reset command is used when you wish to erase all the choices you made concerning the Data-Range, and Primary-key and Secondary-key commands. You can use this

command to erase choices made just before or to erase choices made during a previous Data Sort operation.

Select the Reset command from the Data Sort menu (R). Your choices for the Data-Range, Primary- and Secondary-key commands are erased. Naturally, if you wish to continue with the Data Sort command, you will have to make new choices.

Go

The Go command is used when you have made all necessary choices for the Data-Range, Primary and Secondary-key commands, and feel that you are ready for the records to be sorted.

Select the Go command from the Data Sort menu (G). VIP Professional sorts the records that you selected in the way that you specified. Once the records are sorted, VIP returns to the Ready mode.

Quit

The Quit command is used to return you to the Ready mode in the same position that you were in before issuing Data Sort. This command can be used at any point between selecting Data Sort and issuing the Go command.

Data Query

The Data Query command allows you to find all records in a database or range which meet certain conditions or criteria that you specify beforehand. For example, you might want to find all customers who live within a certain zip code area, or all sales people on the East Coast who sold items totalling under $50,000. What the Data Query command does with these records depends on which one of four subsidiary commands you choose. These subsidiary commands are: Find, Extract, Unique and Delete.

To use the Data Query command you need to prepare your worksheet by creating special ranges. The first range for the Data Query command is the input range. The input range consists of your database or the portion of it that you wish to use. The second range, called the criterion range, is created to contain the criteria by which you select records. Finally, if you plan to use the Extract and Unique commands, you will also need an empty range, headed by field names, which will be a receptacle for the data copied (duplicated) from the input range. This is called the output range. All three ranges are created on the same worksheet.

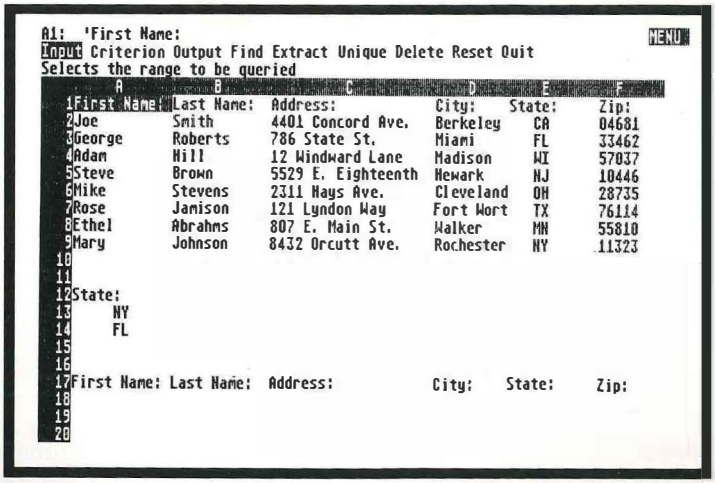
Input Range

The input range is the entire database or any range in it which you wish to use as the object of the Data Query command. Unlike the Data Sort command, the field names at the top row of the database are included when you decide on the input range. For the purpose of the Data Query command, upper and lowercase letters are considered alike in field names. [Space] characters count, even if they are invisible.

Criterion Range

The criterion range provides the criteria by which records are selected. It is constructed in an empty area of your worksheet. Like a database, the criterion range uses the columns and rows of the worksheet for organization. The first row is used for field names. The field names can be all or only some of the same field names as those used in the input range. The only field names you need to include in the criterion range are those from the input range which head fields containing the information that is needed to meet the criteria.

Below the first row of the criterion range, you place the criteria you wish to use in the appropriate fields. If you place all the criteria in one row of the criterion range, a record from the input range will have to match each criterion in the corresponding fields before it is selected. If you use two rows, then a record must match all the criteria of the first row or all the criteria of the second row before it is selected. Using one or more than one rows for the criteria defines whether you want an "and" or an "or" selection process.



Setting Up a Data Query Operation

Using Labels as Criteria:

The criteria you include in a criterion range can be labels, numbers, formulas, or a combination of them. If a criterion is a label, the label from the corresponding field of the input range must match it character for character (excluding the label prefix, but including any [Space] characters) before it is said to meet that criterion. However, there are three special characters which offer some leeway in matching.

These three characters are the question mark (?), the asterisk (*) and the tilde (~). The question mark is used in a criterion label to match any single character which is in the same position in the input label. For example, "ACCT?1" matches "ACCTG1" or "ACCTS1", but does not match "ACTG12". The asterisk is used to end a criterion label and matches remaining characters of an input label. For example, "ACCT*" matches "ACCTS" or "ACCTG2", but does not match "ACTSRVBL". The tilde character is used at the beginning of a criterion label and is used to match every input label except the one which has the same characters as does the criterion label after the tilde. For example, "~ACCTS" matches "ACCTG" or "ACCTS1", but it doesn't match "ACCTS".

These three characters can be used singly or together. When used in combination, the input label must match all characters, including each special criterion label character. For example, "~ACCT*" matches "ACTG1" or "RCVBL", but it does not match "ACCTS" or "ACCTG1".

Using Numbers as Criteria:

If the criterion is a number, then the number from the criterion range must match the number or the current value in the corresponding field of the input range exactly before it meets the criterion. A zero in the criterion range will match a blank or a label in the correct field of the input range.

Using Formulas as Criteria:

If the criterion is a formula, it can be placed anywhere in the criterion range. It is constructed in a certain way which makes its location unimportant. Formulas are written as a test of a record—to be specific, as a test of the first record of the input range. After it has tested the first record, VIP Professional will automatically test the following records sequentially.

Criterion formulas use at least one, if not more, cell addresses. Formulas and cell addresses are discussed thoroughly in the chapter, "Building Formulas Using Operators and Functions". Database @ functions cannot be used in criterion formulas. For the purposes of the Data Query command, all cell addresses referring to cells within the input range are kept relative. All cell addresses referring to cells outside the input range must be absolute.

When the entries of cell references are labels or blanks, they are considered to have a value of zero.

If you construct a formula which refers to a cell in a record directly above the one it is in, the first testing will be inaccurate. This is because the formula is tested on the first record first and, since it refers to the row above the first record in which only field names are located, the reference has a value of zero. For all the following records, the testing will usually be valid.

The criterion formulas have only two results: true or false. If the formula referring to the input record is true, then the record is considered to meet the criterion. If it is false, then the record does not meet that criterion.

Criterion formulas are usually written as a test of the value of one of the record's fields to see if it is equal, greater than, less than and so on. Therefore, they tend to follow a recognizable pattern. The first step of the formula is an operational sign, the most popular being a "+". This is followed by the cell address of the field to be tested. The cell address consists of the column letter of the field and the row number of the first record ("2"). If the row number is something other than 2, the testing will be inaccurate. (As an option, you can use the Range Name Label (Down) command which is described in the chapter, "Range Commands" to indicate the first record.)

The next step is to indicate the way in which the value is to be tested by including another operational sign (frequently, "<", ">", or "=" signs are used). The last step is including a value, either by using a number or indicating another cell address as the value to be compared. As with all other formulas, [Space] is never used.

One of the simplest formulas you could write might look like this: +F2>70. This means the value of the field located at column F, of the first record, has to be greater than 70 before it can meet the criterion. After the first record is tested, VIP Professional automatically goes on to the second one (using the formula, "+F3>70") and so on. Another formula might look like this: +F2<>G2. This means the value of the field located at column F must be greater than or less than that of the field located at column G.

Of course, as you become more experienced in using formulas as criterion, you may want to create more complex formulas. It's a good idea to remember that a formula is tested on each record of the input range and it should be general enough to be useable with each one.

Output Range

An output range only needs to be constructed if you intend to use the Extract or Unique commands with Data Query. The fields from the input range which are selected will then be copied into this range.

The output range is constructed in an empty area of the worksheet. Anything that may have been entered in that area will be erased by the copies from the input range. The top row of the output range consists of the field names of the fields you want copied. Whether this is all of the ones from the input range or just some of them depends on if you want to list entire records or just certain fields from the records. Below the field names, the following rows will be used for the duplicated entries which match the criteria from the criterion range.

Using Data Query

Now that you have an input range, a criterion range and, if necessary, an output range, you are ready to select the Query command from the Data menu (/DQ). The Data Query menu will now be displayed. There are nine subsidiary commands: Input, Criterion, Output, Find, Extract, Unique, Delete, Reset and Quit.

The Input (I), Criterion (C) and Output (O) commands are used to specify the ranges you have constructed. Select each command in sequence. Specify and enter its range. When you specify the input and criterion ranges, you will need to specify the entire range—including the field names. When you specify the output range, you need only specify the field names.

If you have used the Data Query command before, VIP Professional remembers your most recent range specifications and displays them when you choose the commands. If you accept them, simply press [Return] and go on to the next step.

Choosing a Type of Query

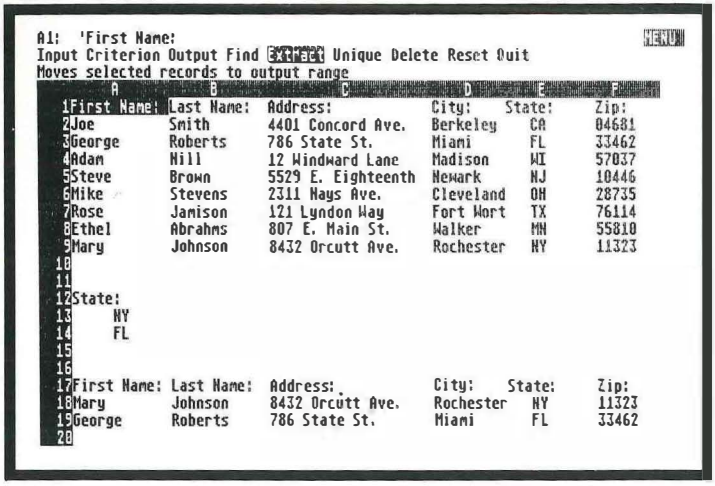
After specifying ranges, you will have to choose a type of Data Query. To do this, you have four command choices: Find, Extract, Unique and Delete.

Find:

Choose the Find command from the Data Query menu (F). Find lets you use the [Up] and [Down] keys to move to and highlight the selected records of the input range. When you've selected Find, the [Up] and [Down] keys only move from one selected record to the next. If there are no more selected records in that direction, the computer beeps at you and remains in the same position. The [Left] and [Right] keys move you left and right in the record you are in. [Home] and [End] move you to the first and the last record of the database respectively, even if these records are not among the selected ones. Both [Escape] and [Return] will take you back to the Data Query menu.

Extract:

Choose the Extract command from the Data Query menu (E). It copies the fields of the records which match the selection criteria into your output range. If there are more records then there is room in the output range (for example, because of worksheet borders), the computer will beep and send you an error message. When this happens, you will have to reconstruct the output range where there is more room, and reissue the Data Query command.



Using Extract

Unique:

Choose the Unique command from the Data Query menu (U). It is the same as Extract, except that, where there are duplicate records, only the first is copied into the output range. If you ever wish to delete duplicate records in a database, this is an extremely useful command. By constructing a criterion range without criteria (leaving the rows below the field names blank), you can copy the entire database into the output range. Since the Unique command doesn't copy duplicates, you will have a database which is free from duplicates.

Delete:

Choose the Delete command from the Data Query menu. It erases selected records from the input range. The remaining records of the input range are moved up so there are no gaps left. Once the records are deleted, they cannot be restored. As a precaution, VIP

Professional prompts you to confirm deletion. If you choose Yes (Y), the records are deleted. If you choose No (N), you are returned to your most recent position in the Ready mode.

Reset:

The Reset command is used when you are dissatisfied with the range choices you've just made or if you do not wish to use any of the ones from the previous Data Query command. It erases all the range specifications you have made. To use the Reset command, select Reset from the Data Query menu (R). Your range specifications are erased.

Quit:

At any point after selecting Data Query and before leaving the Data Query submenu, you can use the Quit command to return you to the Ready mode. Choose Quit from the Data Query menu (Q).

Using the Query Function

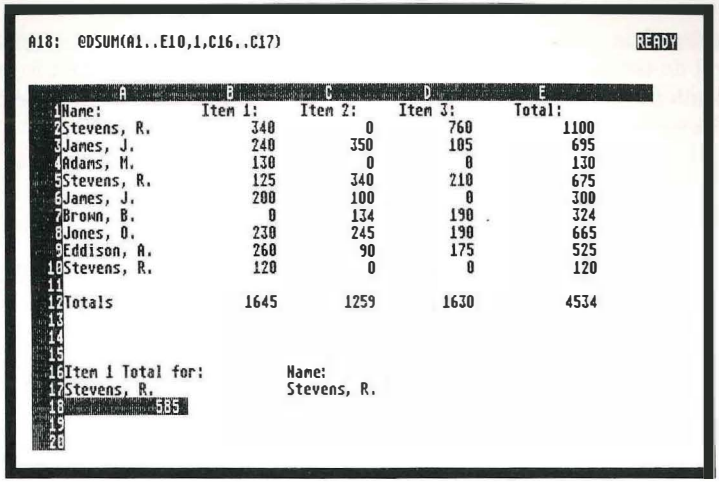
If, after you have used Data Query and then made changes in any of the ranges (input, criterion or output), you may use the special Query function [Function 7]. It will use all the specifications you just made for the last Data Query command to reapply a Data Query operation. If you have used the Reset command with Data Query, this operation can not be completed unless you respecify the needed information with the Data Query command before you use [Function 7].

Using Database @ Functions to Generate Statistics

Seven database @ functions can be used to generate statistics on a database. These @ functions are excellent for the purpose of numeric analysis.

Database @ functions are written as a type of formula. Their definitions are very similar to the statistical @ functions discussed in the chapter, "Building Formulas Using Operators and Functions", except that they are designed specifically for database use. Instead of working on a database as a whole, they operate on one field of selected records in the database range.

The database @ functions are entered as formulas in the following manner: @ function (input range, offset, criterion range). As with other formulas, a [Space] is never used when entering a function.



Entering a Database Function

The input range and the criterion range are exactly the same as they are with the Data Query command (see the previous section in this chapter). The input range specifies the area of the database to be analyzed, including both the records for analysis and the field names.

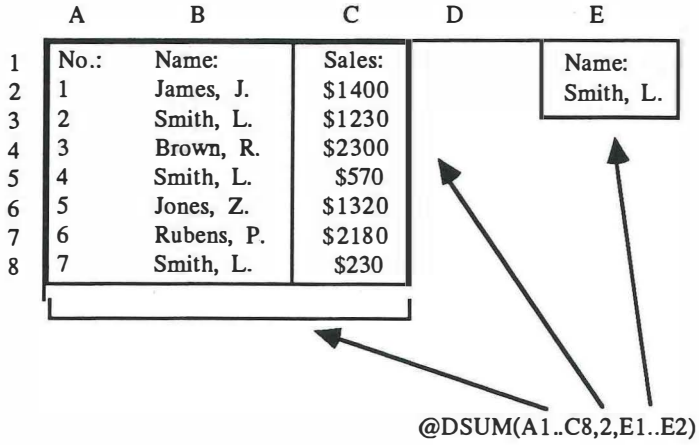
The criterion range consists of the selection criteria for the records, but, instead of selecting fields which meet the criteria, the @ function criterion range is used to select whole records. Like the criterion range of the Data Query command, the criterion range of the database function is constructed in an empty section of the worksheet. It can contain one, some or all of the field names from the input range. The criteria itself can be numbers, formulas or labels (exactly like those used in Data Query).

The major difference between a Data Query criterion range and a database @ function criterion range is that the latter can never be used to select the entire input range (by not including criteria under the field names). Only specially selected records from the input range can be used in a database @ function.

When you specify ranges as part of the @ function, type in the cell addresses or range names. Don't use your arrow keys or mouse. If you use formulas in the ranges, make the ranges absolute by using a dollar sign (for example, "$ACCTSRCVBL" or "$B$10..$F$100").

The offset portion of the @ function is the number of the field from the input range which will be used for calculation by the @ function. To determine this number, count the columns of the input range from left to right, starting with "0" (zero) at the farthest left column, until you reach the field of your choice (the offset).

Once you've typed in your database @ function and pressed [Return] to enter it, the Professional will do the rest of the work for you. First, records are selected from the input range which match the criteria in the criterion range. Then, the @ function operates on the offset of the selected rows.



How a Database Function Works

The seven database @ functions are as follow:

@DCOUNT:
This function counts all the entries from the offset field of selected records.

@DSUM:
This function finds the sum of all the entries from the offset field of selected records.

@DAVG:
This function finds the average value of all the entries from the offset field of selected records.

@DVAR:
This function finds the variance value of all the entries from the offset field of selected records.

@DSTD:
This function finds the standard value of all the entries from the offset field of selected records.

@DMAX:
This function finds the largest value of all the entries from the offset field of selected records.

@DMIN:
This function finds the smallest value of all the entries from the offset field of selected records.

Data Table 1 and Data Table 2

The Data Table commands allow you to construct tables which show how changes from one or two cells of a database (called "input" cells) can change the value of other cells (called "output" cells) which depend on them through formulas. VIP Professional organizes and performs the calculations automatically for this what-if process once you have performed a simple set-up.

With the Data Table 1 and the Data Table 2 options, you also have the option to reset (that is, erase the settings you have made for either of the Data Table options).

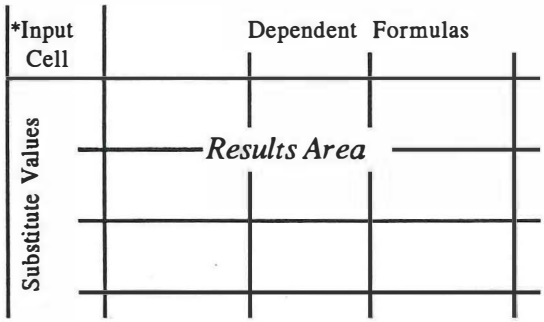
Data Table 1

The Data Table 1 command tries out a series of values (which you specify) in place of the value of one input cell (the value cell which is used as a reference). All formulas of output cells with values that depend on this cell's value are included in the table so that you can see how the entire database is affected by changing the contents of the input cell. In the database itself, the input cell is not affected by this command.

To prepare for the Data Table 1 command, first decide on an input cell from the database. Note which output cells have formulas depending on the input cell. Now find a clear area in your worksheet to use as the range for your data table. In the left column of the range and one row down, list the different values which you wish to try in place of that of the input cell. In the first row of the range and one column over, sequentially enter the formulas of the dependent output cells.

Instead of entering the formulas, you could simply refer to the relevant output cells by typing a "+" and the cell address (no [Space] character may be included). Notice that the top left cell of the range has been left empty. This is reserved for the input cell which will be entered later. You are ready to use the Data Table 1 command to finish the project.

Select the command by choosing 1 from the Data Table menu (/DT1). The computer will prompt you to specify a table range. Specify and enter the range you have constructed. Now the computer will prompt you to specify the input cell. Type its cell address or point to it and press [Return]. VIP Professional finishes filling in the table by calculating the value substitution over each formula.



Formatting for a Data Table 1

If you have used either the Data Table 1 or the Data Table 2 command, VIP Professional automatically displays your most recent specifications for input cell(s) and table range. If you wish to continue using these, simply press [Return] as each one is displayed. Any of the specifications can be changed. To change a specification, you can press [Escape] to cancel the old one, then make a new selection using a mouse or movement keys, or by typing.

VIP Professional has a special Table function which can be used. This Table function [Function 8] activates recalculation of the most recent table range, using the most recent input cells. The Table function is disabled if you have used the Reset command and have not yet specified a new table range and input cell(s).

Reset

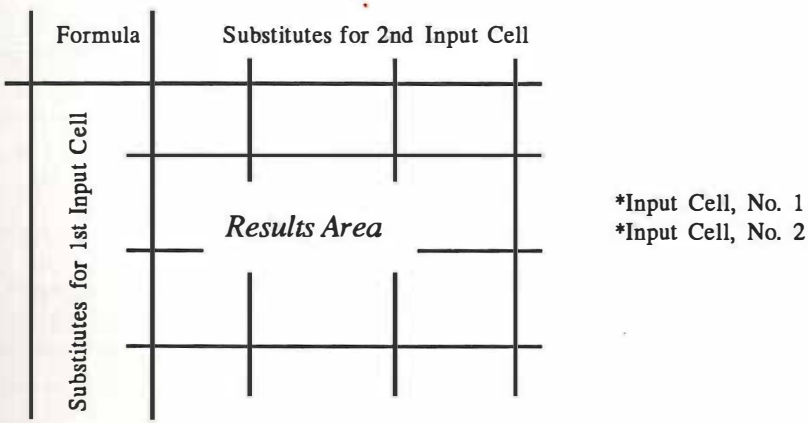
If you wish to erase all specifications you made for either the Data Table 1 or the Data Table 2 command, you may use the Reset command from the Data Table menu (/DTR). If you wish to continue using one of the Data Table commands or the Table function, you will have to specify new input cell(s) and table range.

Data Table 2

The Data Table 2 command is similar to the Data Table 1 command. However, it is used to show the effects of changes in two input cell values on one formula's results. Therefore, it is set up a little differently. As with the Data Table 1 command, the values of the two input cells are not affected in the database.

Before using the Data Table 2 command, you will have to prepare a table range in an empty area of the worksheet. In the farthest left column of the range and starting one row down, enter the values you wish to substitute for that of the first input cell. In the top row of the range and one column over, enter the values you wish to substitute for that of the second input cell. In the top left cell of the range, enter the formula whose results will be reflected in the table. As with the Data Table 1 command you may refer to the cell address where the formula is located instead of typing out the formula (e.g. "+C13"). Now, you are ready to calculate the table.

Select 2 from the Data Table menu (/DT2). Specify the table range and first input cell in response to the prompts just as you did with the first Data Table command. Then specify a second input cell in the same manner as you did the first. After they have been specified, VIP Professional will calculate the table automatically.



Formatting for Data Table 2

If you have used the Data Table commands before, VIP Professional will display your most recent specifications in response to the prompts. You may accept them by pressing [Return] or you may change them by specifying new choices. The table calculation can be repeated by using [Function 8] which is the special Table function. Of course, if you have

used the Reset command to erase your specifications, this function will be disabled until you have entered new specifications.

Data Fill

The Data Fill command is used to enter a series of numbers at specified increments or decrements into a range. This command is frequently used to number your records sequentially or to prepare values for an X range of a graph.

Before using the Data Fill command, you will need to decide on the range you want filled. Keep in mind that the ranges are filled columnwise; each column is filled in the order of first to last row before the next column to the right is begun. Frequently, you will be specifying only one column.

You will have to decide on a "start", "step" and "stop" value. All three of these are numbers or formulas. A start value is the value at which the Data Fill command starts its sequence of numbers. It will be placed in the top left cell of the range. A step value is a positive or negative integer (or formula) which decides the increment or decrement by which each number of the range is further increased or decreased. A stop value is the last value you want to use in the sequence.

Initially, VIP Professional is defaulted to these values: start value = 0, step value = 1 and stop value = 2047. When you are issuing the Data Fill command, VIP Professional will automatically display these in response to prompts. If you accept the values, simply press [Return] to enter each in turn. If you wish to use different values, specify and enter those instead.

Select the Fill command from the Data menu (/DF). It is a good idea, although not strictly necessary, to have the cell indicator placed over the top left cell of the range. In response to the first prompt, specify the range and enter it. In response to the following prompts, type in the start, step and stop values you have decided on, pressing [Return] to enter each. VIP Professional will automatically fill in the specified range using your values. It will stop when it reaches the last cell of the range or uses the stop value; whichever comes first.

Data Distribution

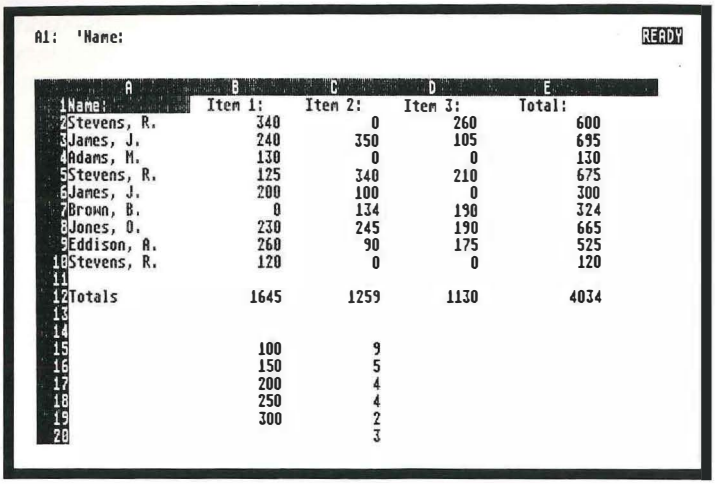
The Data Distribution command is used to find a frequency distribution for a range of values from a database. VIP Professional finds the frequency distribution by using a sequence of numbers increasing at a preset increment to organize groups of values from the range.

It is similar to using a filing system where all values that fall within certain value limits are grouped together, all values which fall within the next, higher value limits are grouped together and so on. For example, to find the number of values from your worksheet which have a value of between 1 and 100, and to find out how evenly distributed they are within those limits, you would use Data Distribution. When you construct the bin range, you will make its lowest value 1 and its highest value 100. You can set the increments of the bin range at 10, or, if you want a more exact record of distribution, you could set the increments at a smaller number such as 5. Then you would choose the part of your database from which you want your values distributed. VIP Professional considers both number and current formula results as values from the range when it executes the Data Distribution command.

Before selecting the Data Distribution command, you will need to construct a bin range in an unused area of the worksheet. The bin range consists of the number sequence which is used to divide the groups of values from the range into levels (or bins, as they are sometimes called). The bin range is a one-column range which contains a series of numbers increasing incrementally. The column immediately to the right of the bin range, extending an extra row below it, needs to be left blank. This will be used as the results area and is not considered a part of the bin range. It is easiest to use the Data Fill command (described in the last section), to construct the bin range.

Select Distribution from the Data menu (/DD). In response to the first prompt, specify the range from which values are taken (the "values range") and enter it. In response to the second prompt, specify the bin range in the same manner. Do not include the results area in your specification.

VIP Professional will use the results area to enter the number of values it considers as belonging in each bin. First, it counts all the values which are equal to or less than the first value entered in the bin range. The resulting number is placed in the column of the results area, in the cell directly to the right of the first bin cell. Then, VIP Professional counts all the values from the range which are greater than the first bin value, but equal to or less than the second bin value. The resulting value is placed in the results area column next to the second bin cell. This process is continued until all the values in the bin cells have been used. The last row of the results area, the one that extends beyond the last row of the bin range, is used to enter the number of values which are greater than the last value (the largest value) of the bin range.



A1: 'Name: READY

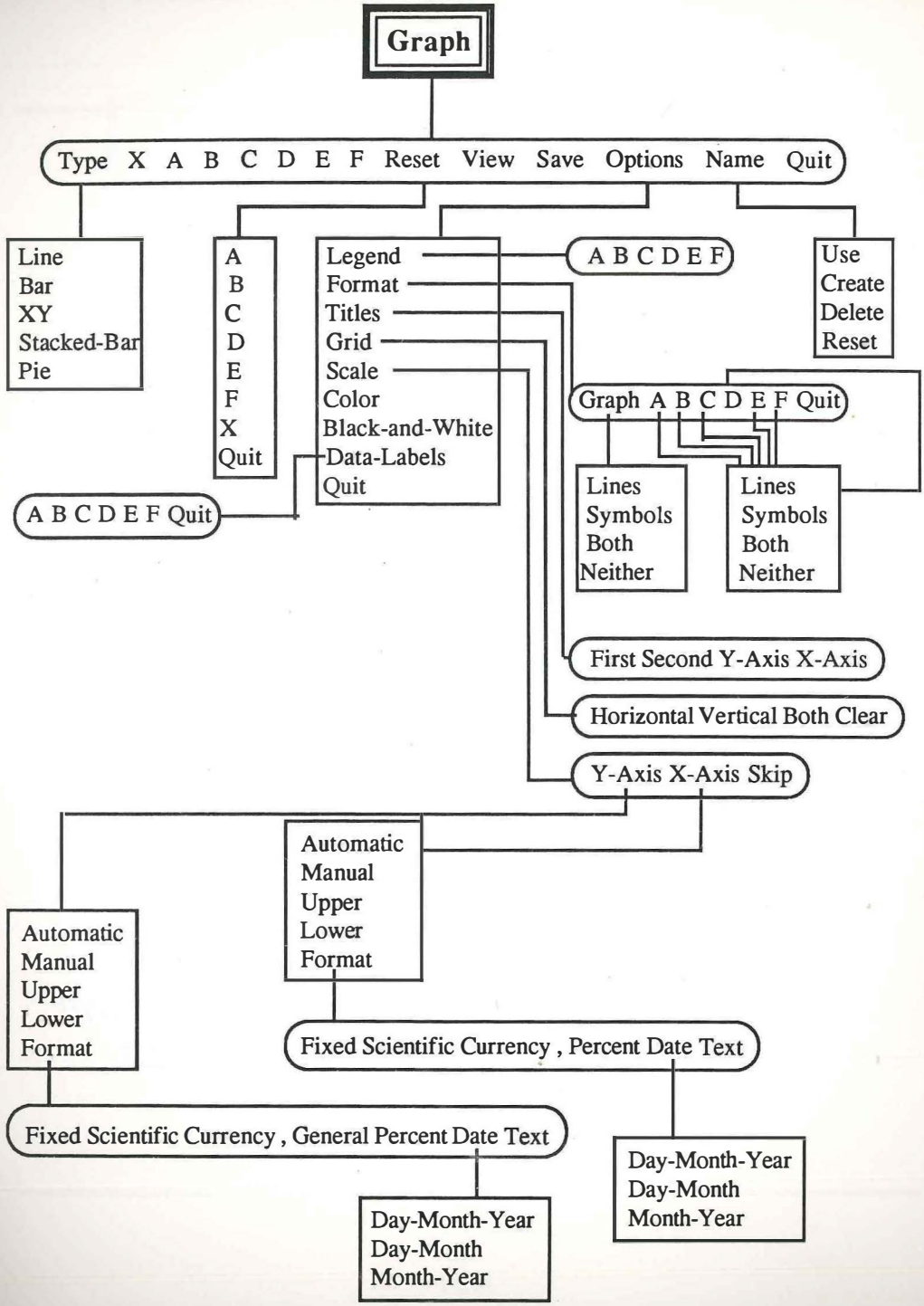
	A	B	C	D	E
1	Name:	Item 1:	Item 2:	Item 3:	Total:
2	Stevens, R.	340	0	260	600
3	James, J.	240	350	105	695
4	Adams, M.	130	0	0	130
5	Stevens, R.	125	340	210	675
6	James, J.	200	100	0	300
7	Brown, B.	0	134	190	324
8	Jones, O.	230	245	190	665
9	Eddison, A.	260	90	175	525
10	Stevens, R.	120	0	0	120
11					
12	Totals	1645	1259	1130	4034
13					
14					
15		100	9		
16		150	5		
17		200	4		
18		250	4		
19		300	2		
20			3		

Using Data Distribution

As with many other data commands, VIP Professional remembers the range specifications most recently used and displays them in response to the prompts. To accept them, press [Return] and continue. To change them, press [Escape] and specify new ranges.

Graph Commands

Graph Type
Graph X
Graph A—F
Graph Reset
Graph View
Graph Save
Graph Name
Graph Options
Graph Quit


Graph
Type X A B C D E F Reset View Save Options Name Quit
Line
Bar
XY
Stacked-Bar
Pie
A
B
C
D
E
F
X
Quit
A B C D E F Quit
Legend
Format
Titles
Grid
Scale
Color
Black-and-White
Data-Labels
Quit
A B C D E F
Graph A B C D E F Quit
Lines
Symbols
Both
Neither
Lines
Symbols
Both
Neither
Use
Create
Delete
Reset
First Second Y-Axis X-Axis
Horizontal Vertical Both Clear
Y-Axis X-Axis Skip
Automatic
Manual
Upper
Lower
Format
Automatic
Manual
Upper
Lower
Format
Fixed Scientific Currency , Percent Date Text
Fixed Scientific Currency , General Percent Date Text
Day-Month-Year
Day-Month
Month-Year
Day-Month-Year
Day-Month
Month-Year

Graph Commands

Introduction

Graph commands create visual presentations of your worksheet's data. VIP Professional graphs are dramatic, effective in highlighting certain relationships among data that might be otherwise underplayed and, at the same time, easy to create. As in other areas managed by VIP Professional, the Graph commands are extensive and versatile enough to meet your particular needs and yet simple enough to use easily.

There are five different types of graphs you can create, along with several different options available with each graph (such as adding titles or using color). You can even switch from one type of graph to another. VIP Professional offers you a tremendous amount of latitude in creating the type of graph that best suits your purpose.

The graphs you create may be printed using the GraphPrint program (described in Appendix A) and an appropriate printer. The commands from the Print menu cannot be used to print graphs.

Creating and Viewing Graphs

When you create a graph, there are only two decisions you are required to make. The first is what type of graph you want drawn (by using the Graph Type command) and the second is which range from the worksheet you want represented (most often by using the Graph A command). All other decisions and embellishments are optional.

The first step in creating a graph is selecting Graph (/G) from the main menu. This calls up the Graph menu. It looks like this:

TYPE X A B C D E F RESET VIEW SAVE OPTIONS NAME QUIT

In the following sections of this chapter, we will discuss these graph commands in the above order. Their submenus are discussed in the order of probable use.

When you are ready to view a graph, you may use the Graph View command or, if you are in the Ready mode, you may use [Function 10] (the Graph function). In the GEM version of VIP, a window is created on the screen and the graph is drawn inside of it. In the text version, the graph replaces the worksheet on the screen.

Graph windows are similar to worksheet windows in several ways. Although you may move outside the window by using your cell pointer and mouse, you cannot move beyond

the window borders with your arrow keys. Like worksheet windows, a graph window may be made smaller by using a Size box in the lower right corner. It may be moved around the screen by dragging the mouse while it is over the Title bar and it has a Full box (upper right corner) which allows you to expand it to fill the screen. Then, with the next click of the mouse over the Full box, you can return it to its former size. The Quit box in the upper left corner allows you to erase the graph window by clicking over it.

VIP graphs have an interesting feature which ties in with the size of the graph window. If you change the graph window so that it is wide and short, your graph will change proportionately (within certain limits) so that it too is wide and short to fit in the window. If the graph window is thin and tall, your graph will also be thin and tall. Of course, if you make a graph window very small, it will start cutting off sections of the graph display.

After viewing a graph, you may erase it. To erase it, press any key while the graph window is active or click the mouse button over the graph window's Quit box. When you are ready to view it again, you may use the Graph View command or [Function 10] in the Ready mode to redraw it. Of course, if you are using a mouse there is no need to erase your graph when you are not viewing it. You may simply switch from one window to another by moving the cell pointer to the window you want active and clicking the mouse button. The active window is always placed on top of the inactive window in the areas where they overlap. The details of the active window are also more defined than those of the inactive window. The Size, Full and Quit boxes cannot be found on inactive windows.

It may appear as though a worksheet or graph disappears when it is not active because of the overlapping feature. If this should happen, make the active window small and use the Title bar to move it around the screen until you can see the inactive window beneath it. When you click the mouse button over the inactive window, it will become active again.

Graph Type

There are five types of graph offered by VIP Professional: Bar graph, Stacked-bar graph, Line graph, Pie chart, and XY graph. The first three types of graph can represent different values for up to six sets, or ranges, of related data. The Pie chart represents different data values for a single set of data. The XY graph represents two related values for each piece of data in the range. Instead of being one-dimensional like the other graphs, it is two-dimensional. An XY graph can represent up to six different sets of data in one graph. Stacked-bar graphs and Pie charts should not be used to show both positive and negative values.

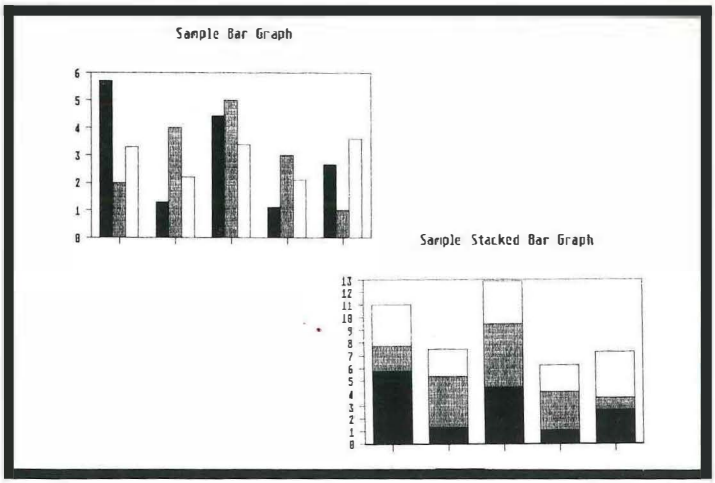
Bar Graphs

A Bar graph is probably the simplest type of graph you can draw and the easiest to represent different sets of data with. Bar Graphs compare one or more series of numbers. They use a horizontal basis to line up the sets of data. Each piece of data is represented by a

rising vertical bar. Each bar is drawn to scale and is adjusted to the height which indicates its value or amount.

Stacked-bar Graphs

A Stacked-bar graph is similar to a Bar graph in that it uses rising vertical bars to represent data. However, only one set of data extends across the horizontal basis. The other sets of data are stacked on the first set. Its best use is for comparing consecutive values of data from several sets.



Bar Graphs

Line Graphs

A Line graph uses a scale to show amount or value in a vertical fashion. The sets of data are horizontally lined up below the graph. The values are indicated by lines, labels and/or symbols at the height (adjusted to scale) which represents their amount or value. Like the Bar graph, the Line graph is mainly used to compare one or more series of numbers.

Although it is called a Line graph, Line graphs do not necessarily use lines to depict sets of data. There are four options you may use singly or (when possible) in combination to show the values in a Line graph. To choose the format of your Line graph, you will use the Graph Options Format or the Graph Options Data-Labels command.

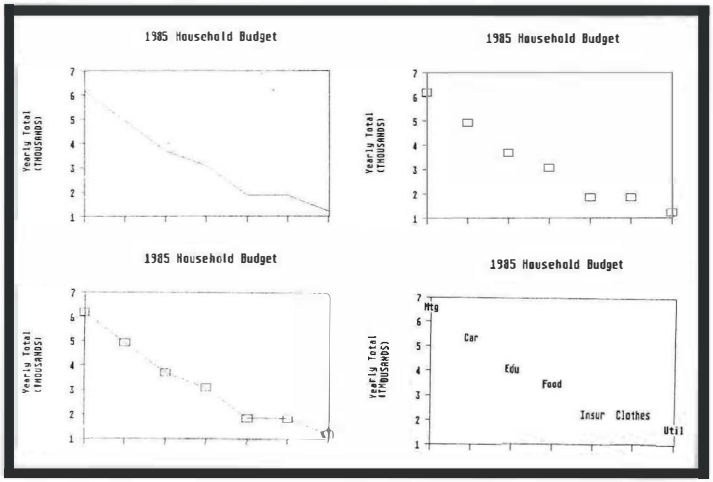
The first option is using symbols to represent different sets of data. Each set of data uses a different symbol and each piece of data is represented by the symbol of its set. The

symbol is placed directly above its item on the horizontal axis (base) at the height which indicates its place on the scale.

In place of symbols, you may use data labels to depict the values on your graph. The data labels are chosen from a range in your worksheet and each point on the graph is represented by its own label.

A third option is using a line to indicate the position of each data item on the scale. Imagine using an invisible dot to pinpoint the data's position on the scale. Then draw a line connecting the dots from the left to the right side of the graph. One line is used for each range of data. This is the line option.

A fourth option is using a combination of line and symbol. A line is drawn across the graph to represent the position of each piece of data in a range. Then the position of each piece is further identified by the symbol representing its range.



Line Graph Options

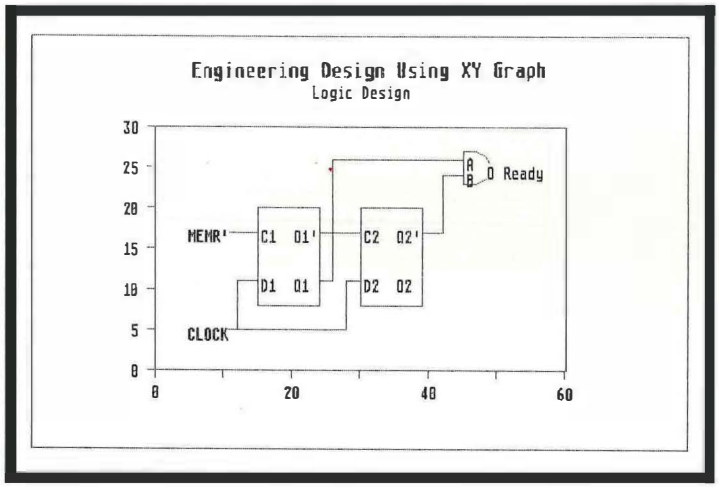
Pie Charts

A Pie chart is round and divides one set of data into slices. The size of these slices depends on the amount or value of each piece of data in respect to that of the entire range. VIP Professional considers the entire chart to be 100% of the range. It automatically calculates a percentage for each slice (which is rounded off to one decimal). Totalled, the individual slices equal 100% or as close to 100% as is possible. Pie charts best demonstrate how one piece of data affects the entire set.

VIP Pie charts have an interesting feature which displays the first slice of a Pie as "exploded" (that is pulled partially out and separated from the other slices).

XY Graphs

XY graphs use two numeric scales to represent data. The first scale is placed on a vertical axis (the Y axis) similar to the Bar and Stacked-bar graphs. The second scale is placed on a horizontal axis (the X axis). With Bar graphs and Stacked-bar graphs, the X axis is reserved for the horizontal line-up of the sets of data. With its two axes, the XY graph represents pairs of values instead of the single values the others do for set(s) of data. For example, you can represent the monthly and yearly sales figures for several items. Each of up to six sets of data is connected with a line. The position of each piece of data on the biaxial (that is, using both horizontal and vertical axes) scales is emphasized by a symbol representing its range. Each piece of data can also be labeled individually to avoid confusion.



A XY Graph

Choosing a Graph Type

To choose a type of graph, first select the Type command from the Graph menu (/GT), then choose the type of graph. The types are chosen by typing their initial letters (B for Bar, S for Stacked-bar, L for line, P for Pie, or X for XY). It is a good idea to choose the type of graph, select all the options you want to use with it, and then view it after you've made your choices. VIP Professional will not display your graph for you until you use the Graph View command.

Changing Graph Types

To change from one graph type to another while still representing the same data, reselect the Type command from the main Graph menu and enter the type you want. Then, reselect View from the menu to see the result.

Graph X (Specifying a X Axis for Data or Optional Labels)

The X command from the Graph menu is used to specify a X axis (the horizontal axis). With Bar, Stacked-bar and Line graphs, this command can be used to place optional labels along the horizontal border. With Pie charts, the labels are placed to the right of the Pie.

The X command has a different function with XY graphs. With XY graphs, VIP Professional replots the original data values from the Y axis (vertical axis) to take into account the new X axis values. Each piece of data is now plotted in accordance to the relationship of the X and Y axes' values. The X value range is used to replot the first set of values from the Y axis (the A range), then the second (the B range) and so on with the X values used in the order the X range was selected.

With Bar, Stacked-bar and Line graphs, VIP Professional places the labels at equally distant intervals along the X axis underneath the bars. With Pie charts, VIP Professional arranges the labels to the right of the chart.

Select the X command from the Graph menu (/GX). Then specify and enter a range of labels or values from the worksheet in response to the prompt. You may find you need to create one which suits your needs beforehand. VIP Professional automatically does the rest of the work. Notice that X labels are not limited to label entries but can also be numbers or formulas. In fact, values are usually used with the XY graphs.

Graph A, B, C, D, E, or F

These six letters (A, B, C, D, E, and F) are used to select the different sets of data needed for the graph by using a cell range from a worksheet. Since at least one cell range must be indicated, selecting A is mandatory. Select A from the Graph menu (/GA). Now specify the cell range from your worksheet and enter it in response to the prompt. Actually, for all graphs, excepting Pies, you may substitute any other of the range command choices (B - F) for A.

There are two things to remember when deciding which data from a worksheet to use in a graph. The first is that the amount of data should be kept down to a manageable level. The second is that, to give it sense, the data should have some common theme. Frequently, the

data you want to use for your graph ranges cannot be found in one convenient range. At times, you may even want to contrast distant parts of your worksheet in a graph. When this happens, copy the cells you want to use into an unused portion of the worksheet so that you can use the range command on them there.

After you have selected a primary range with Graph A (or a substitute range command), you may decide you wish to compare similar sets of data with it. Select letters B - F the same way you did A and specify a range for each. The additional sets of data you choose will be integrated with that of A. The first values of each range will be grouped together, then the second values of each range are grouped together and so on.

VIP Professional saves these different sets of data from causing confusion by making them contrast. Both types of bar graphs (Bar and Stacked Bar) in black and white use different crosshatching patterns. VIP Professional can also use color to distinguish the different data ranges. Even without a color monitor, you can select the Options Color command. If you do use a black and white monitor, the graph won't be displayed in color on the screen.

When you use the Options Color command, each range is displayed in an identifying color. If you want the color of a specific part of the graph changed, either change the range identity of the part (for example, from A to F) or use the Control Panel in the Desk menu.

Graph Reset

The Reset command allows you to erase graph type and range settings for an entire graph, just for the graph type or for individual range settings. What is reset depends on which option you select with the Reset command. Usually this command is used after you have saved a graph, and now wish to create a new graph with your data.

Select the Reset command (R), then the option which indicates what you want reset. Graph (G) erases the entire graph from the computer's memory. X (X) erases labels from non-XY graphs and the X range from XY graphs. A to F (A, B, C, D, E and F) erases individual range settings. VIP Professional acts as though you had never specified that graph, type or range setting before. However, if it was a data range that was reset, VIP Professional remembers the legend and format selected for it. If you select another data range to replace the one that was reset, the legends and format will automatically be reused.

Graph View

The Graph View command is used to see your graph after you have selected all necessary ranges and options for it. Select the View command from the Graph menu, (/GV). Graph settings will be remembered while the original worksheet is still in use, even if you are no longer viewing the graph. With the text version, the graph will replace the worksheet on

your screen. With the GEM version, the graph will be displayed in a window similar to that of the worksheet.

If you are using a mouse, you may decide to share the screen between the graph and worksheet windows once you have used Graph View. To move from one window to another, move the cell pointer and click the mouse key. This also makes the window you've clicked in active and the other inactive.

Once you have viewed a graph, you may decide that you want to return to the worksheet to change some values or add some options and look at the graph again. If you erase your worksheet (by pressing Escape or clicking the mouse button over the Quit box), you may redraw your graph later using Graph View again or you may use the special Graph function (by pressing [Function 10] or choosing it from the VIP menu with your mouse). If you used your mouse to move the pointer from one window to another and clicked the mouse button to make that window active, you may move back to the updated graph by changing active windows.

Graph Save

The Graph Save command is used to store a current graph in a graph picture file for printing or to be used in other programs. The command adds the extension ".gph" to the file to distinguish it from other types of files.

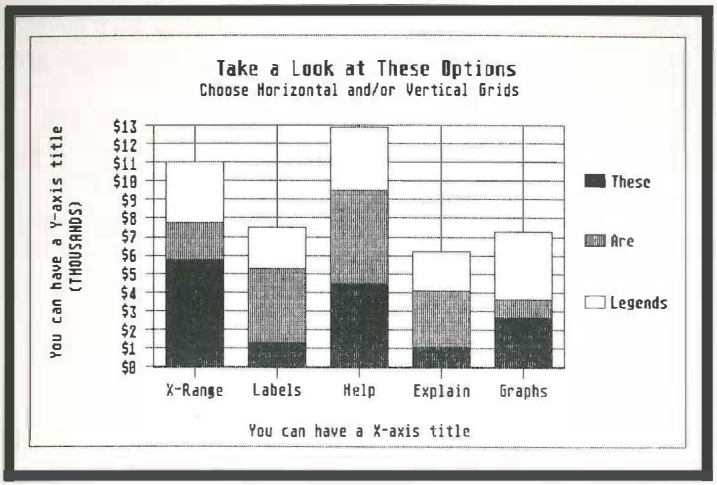
To use the command, select Save from the Graph menu (/GS). Give a file name either by typing one and pressing [Return] or by choosing one from the menu of existing .gph files. If you choose an existing file name, VIP Professional will ask if you wish to erase the current graph before it accepts the new one. Once erased, the file cannot be recalled. Lower- and uppercase letters are considered alike when you enter graph file names. They can be up to 8 characters long, and use the letter or number characters and the "_" character.

Once the file name has been chosen and entered, the graph's image is stored on the current directory—unless you have used a disk prefix to specify another disk drive.

Graph Options

The Graph Options commands are a set of optional commands which allow you to do such things as adding legends and deciding the format for your graphs. They are used for aesthetic purposes and to offer additional information about the graph.

To display the Options menu, select Options from the main Graph menu (/GO). You may choose as many options as you want before returning to the main Graph menu or the Ready mode. Quit (Q) will take you out of the Graph Options menu. [Escape] can also be used to back you up one command step at a time.



The Graph Options

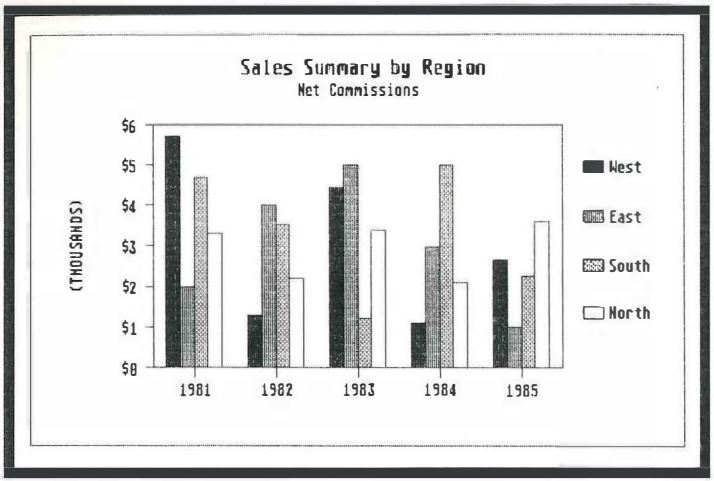
Graph Options Legend

The Graph Options Legend command controls labels which act as keys to your graph elements. The legends are assigned to each of the colors, gray shades or cross hatching used in your graph. Legends are ignored with Pie charts.

Choose the Legend command from the Graph Options menu, (/GOL). Then select the data range by typing the letter of the range: A, B, C, D, E or F. The most recent legend for that range is displayed in response to the command. If you accept it as is, press [Return] and continue with your work.

A legend is a label which can be up to 19 characters long. For the sake of the display, we suggest you keep legends as short as possible. Sometimes you may find that, when you specify legends, the screen will display more characters than the printer will print.

In addition to typing in legends, you could also use a cell's contents as a legend. To use a cell's contents, specify the Graph Options Legend command just as you would otherwise, only, instead of typing in the legend, type in a backslash ("\") followed by a cell address or a range name and press [Return].



Using Legends with a Bar Graph

If you choose a range name, VIP Professional will use the contents of the top left cell of the range as the legend. If you use a cell's contents as a legend, VIP Professional considers the reference to be absolute. If the cell's contents are changed or transferred to another area, VIP Professional continues to use whatever contents are still at the same cell address.

The next time you view your graph, the legends will be displayed at the side of the screen. If you reset the corresponding data range, VIP Professional no longer displays the legend but it retains it in memory. When you specify another range to take the place of the first one, the legend will reappear.

VIP Professional stays in the Options submenu until you use Quit to return to the Ready mode. If you wish to specify a legend for another range, select Legend (L) again, and specify your new range and legend.

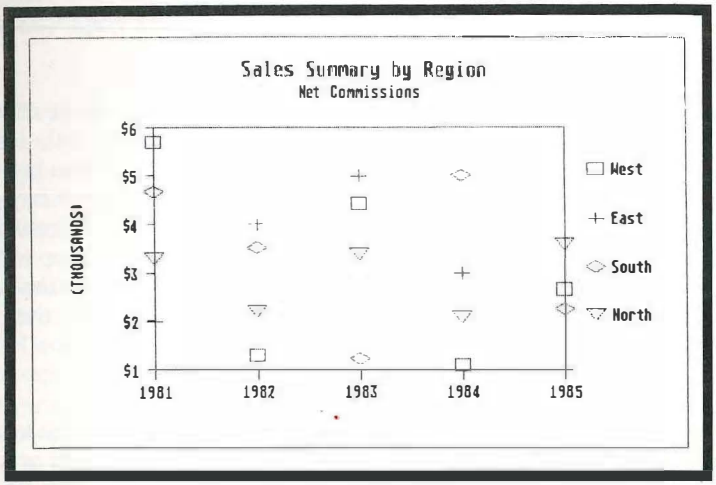
Graph Options Format

The Graph Options Format command determines the way data points are shown or connected in XY and Line graphs. The options include using a line to connect all the points from one range, symbols to show all the data points (each range using a different symbol), neither lines nor symbols or both a connecting line and symbols for the points.

Select Format from the Graph Options menu, (/GOF). To set an overall format, select Graph, (G). To select a particular range from the graph, choose the range by its letter, (A...F). Now select the type of format you wish to use: Lines (L) for lines, Symbols (S)

for symbols, Both (B) for both lines and symbols, and Neither (N) for neither lines nor symbols and returning back to the Graph Options Format menu. If you select Neither, you will have to use the Graph Options Data-Labels command to designate your ranges.

The next time you view your graph, the chosen formats will be displayed. VIP Professional stays in the Format submenu after you have chosen a format option. You may format additional ranges at this point. To return to the Options submenu, select Quit, (Q).



Selecting the Symbols Option for Line Graphs

Data-labels

The Graph Options Data-labels command is used to specify a range of cells from the worksheet whose contents will be used to label the data points from a given range (A...F) in all graphs except Pie charts.

Select the Data-labels command from the Graph Options menu. Choose the letter of the data range you wish to label (A...F). Now specify the range of cells from the worksheet which you want to use as labels. Any formula or number will be converted to a label according to its current value and the Range or Global command affecting its cell format before it is displayed on the graph. If you previously selected a range, it will be displayed. As the last step, select the alignment of the labels to the data points by typing the first letter of the choice. Choose "C" for Centered, "L" for Left, "A" for Above, "R" for Right and "B" for Below. For Bar graphs, always choose Above for bars with positive values and Below for bars with negative values.

The next time you view the graph, your data labels will be displayed in position. VIP Professional stays in the Data-labels submenu until you issue a Quit command (Q). If you use a command from the Graph Reset menu to erase a range at some later time, you will also erase the data labels from that range.

Graph Options Titles

The Graph Options Titles command is used to title the entire graph (with a main title and/or a subtitle), or individual axes (X or Y).

Select the Titles command from the Graph Options menu, (/GOT). Now choose to enter a First line (F) in the graph title, a Second line (S) in the graph title, a title for the X — or horizontal — axis (X) or a title for the Y — or vertical — axis (Y). The last title used for your option will be displayed. To accept it, press [Return]. To change it, press [Escape] and enter the title of your choice in its place. VIP Professional has automatically placed you in the Edit mode to make writing and revising easier. You may use up to 39 characters in a title. However, we suggest that titles, like legends, be kept as short as possible. While some lengthy titles appear acceptable displayed on the monitor, they may contain more characters than the computer will print. The First graph title uses a larger font size when it is displayed than the Second one does.

Instead of typing a title, you may use the contents of a cell as a title. To do so, start your Title entry with a backslash ("\") and either type in the address of the cell or a range name. Press [Return]. If you type in a range name, the cell contents of its top left cell will be used. Should the cell contents be changed before you use the Graph Save command, whatever contents are at the location you specified will be used as the current title. Numbers and formulas assume their current values and can also be used as titles.

When the new titles are displayed, both graph titles (First and Second) are centered at the top of the graph. Graph titles are independent from file names you choose for the Save and Name commands. X-axis titles appear below the horizontal axis and Y-axis titles appear parallel to and to the left of the vertical axis.

VIP Professional stays in the Options submenu until you issue a Quit command (Q) to go back to the main Graph menu.

Graph Options Grid

The Graph Options Grid command is used to add horizontal, vertical or both grid lines or remove all grid lines from all graphs other than Pie charts.

Choose the Grid command from the Graph Options menu, (/GOG). Your options are: Horizontal (H) for horizontal lines, Vertical (V) for vertical lines or Both (B) for both vertical and horizontal lines. To remove all grid lines, choose the Clear (C) option.

If grid lines are added, they will appear at each scale mark in the direction you specified the next time you view your graph. Scale marks are "ticks" (tiny lines) set at equal distances along the axes. These measurements decide how each piece of data is represented by adjusting its value to scale. If all lines are removed, the grid lines are no longer visible the next time you view your graphs although the data points still maintain their coordinates.

Graph Options Scale

The Graph Options Scale command allows you to move between automatic and manual scale settings in all graphs (except Pie charts which don't use scaling). It also allows you to specify a "Skip" factor for the X-axis labels.

Usually, you will want to stick with the automatic scaling. However, at times, you may wish to take advantage of manual scaling to get a close-up view of a particular portion of a XY graph. For example, you may have created an intricate engineering model, and wish to see exactly where two points intersect. If the automatic scaling does not allow a good enough view, you can change to manual scaling and change the scale to look at just a portion of the entire graph.

Scaling is initially set to Automatic with VIP Professional. Once you've chosen the data for your graph, VIP decides what increments to use for scaling. For example, if each piece of data you chose for a Bar graph varies by about ten points, than the increment for the scale numbers will be ten points. The scale numbers and ticks showing the scale numbers rising incrementally are lined up vertically along the Y axis (and X axis for XY graphs). How many scale numbers (increments) are used depends mainly on the highest and lowest ranges. When the values of the graph data are displayed, the length of each bar is decided by the scaling.

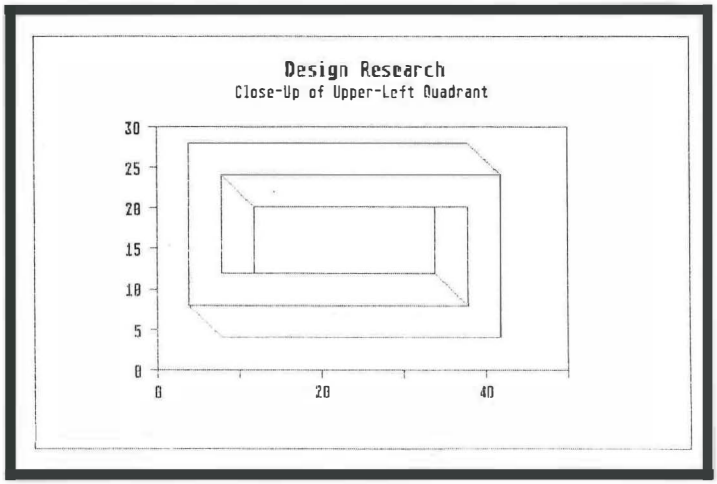
If you change scaling to Manual, you can change the upper and lower limits of scaling, but you will not be able to change the scale increments yourself. However, the increments are modified by the changes you make in upper and lower limits.

To use the command, select Scale from the Graph Options menu. Then select Y-axis (Y), X-axis (X) or Skip factor (S). The X-axis scale setting can only be used with XY graphs.

If you chose Y-axis or X-axis, you will now have to specify Automatic (A) or Manual (M) scaling. Scaling is initially set to Automatic. If Manual is chosen, specify an Upper (U) and Lower (L) scale limit by choosing Lower first and typing a number for the lower scale limit. Enter your choice by pressing [Return]. Then choose Upper. Type in and enter an upper scale limit. To ensure that the scale includes zero in Bar and Stacked-bar

commands, VIP Professional ignores a positive Lower scale limit or a negative Upper scale limit.

For both Manual and Automatic scaling, VIP Professional uses round numbers as upper and lower limits. Although you set the limits with Manual scaling, VIP Professional can only use the round numbers which are closest to the limits you set. "Tick" marks are drawn next to each scale number, evenly spaced along the axis. If a range of data point values is too varied (for example, a range which has some values differing by 5 or 10 points but whose lowest and highest values range differ by one or two million), the highest values may not be able to fit on the graph and will be excluded. Otherwise, VIP Professional tries to include all the data values in the graph. If you have set a scale too small to include all the values of a data range, VIP Professional adds to the scale until the entire screen has been filled.



Using Vertical, Manual Scaling with a XY Graph

If you select the Skip command (S), you will need to type in a number for the Skip factor and enter it. Then, starting from one, every nth entry (depending on the number you chose) will be taken from the X range and used as a label along the X axis (the horizontal one). For example, if five is the Skip factor, the first, sixth, eleventh (and so on) entries from the range are used as graph values.

When you have used the Graph Options Scale commands, VIP Professional continues to return you to the Scale submenu until you choose Quit (Q) or Escape. This takes you back to the Graph Options menu.

Graph Options Scale Format

The Graph Options Scale Format command allows you to control the format in which scale numbers on a graph are displayed. Pie charts are ignored by this command. The initial setting used by VIP Professional to display your graphs is the General Format. This is a fairly standard format choice, but with VIP Professional you have an additional seven choices: Fixed, Scientific, Currency, Comma (","), Percent, Date or Text. Their displays are the same as those described under Worksheet Global Format, see the chapter, "Worksheet".

Choose the Format command from the Graph Options Scale menu. Notice that before you can use this command, you will have to go through the necessary options available with Graph Options Scale (for example, you will have to choose X axis or Y axis). Select your desired format and, in response to the prompts, type and enter the additional information (like number of decimal places for the Fixed option). After you have selected this command, VIP Professional will return you to the Options submenu. The next time you view your graph, the scale numbers will be set to the format you have chosen.

Graph Options Color or Black and White

The Graph Options Color/Black and White commands are used to decide whether your data bars, lines or symbols will be displayed in color or in black and white. If Black and White is chosen, the data bars will be displayed in contrasting patterns to avoid confusion.

Choose Color or Black and White from the Graph Options menu, (/GOC or /GOB). If you have chosen black and white, all data bars will be displayed in the contrasting patterns. If you have chosen color, VIP Professional will display symbols, data bars and lines from different ranges in various colors. Titles, legends, scale numbers, axes and grid lines will always be displayed in a uniform color. The colors used for display depend on color choices you made with the Color Palette in the Control Panel. The Control Panel is displayed by choosing "Control Panel" from the Desktop menu.

Graph Name

VIP Professional has a set of four commands grouped in a submenu under the Graph Name command. These commands are used to identify and manage groups of graph settings. Named graph settings are different from graph files (made with the Graph Save command) in that they are the specifications you made for a graph saved as a group along with your worksheet in a worksheet file.

Create

The Graph Name Create command is used to store all graph settings for each graph in one group. Because of this command, you can create more than one graph from a worksheet by saving the graphs on which you are not currently working in separate groups. Both graph settings and range locations can be saved with this command. Then, by using the Graph Name Use command, the group of graph settings can be reopened.

Select the Create command from the Graph Name menu (/GNC). Enter a graph name up to 14 characters long. If you use an existing name, VIP Professional erases the old graph settings and replaces them with the new. Once this has happened, there is no way to replace the old graph settings. We suggest you use an existing graph name with care. VIP Professional returns to the main Graph menu after you issue Graph Name Create. The graph settings are saved in the worksheet file with the name you chose.

The graph settings you save with the Graph Name Create command will be saved along with all other worksheet settings when you use the File Save command. The File Retrieve command is used to retrieve the worksheet and all its named graphs. The File Combine command does not retrieve graph settings. Since the graph settings are saved as part of the worksheet, the Worksheet Erase command erases the worksheet and its settings (including the graph settings, along with cancelling their names). The Graph Name Delete and the Graph Name Reset commands are used to delete graph settings without deleting a worksheet. Graph Reset Graph does not cancel graph names, named graphs or saved graphs.

Use

The Graph Name Use command is used to pull out named graph settings from storage on the worksheet so that you can work with them as the current graph. Select the Use command from the Graph Name menu (/GNU). Now enter the graph name. VIP Professional will use the current graph settings to redraw the graph on the monitor.

Because VIP Professional saves the location of cells in the specified ranges rather than the contents of the cells, you may change the graph's contents by changing the information in your worksheet. Using the Graph Name Use command, VIP Professional will evoke the stored graph settings and use them with any new information integrated.

Delete

The Graph Name Delete command is used to delete named graph settings individually. To use it, select the Delete command from the Graph Name menu. Specify the name of the graph which you wish to delete. VIP Professional does not wait for confirmation before it erases the graph name and settings. Make sure you are deleting the right group of graph

settings before pressing [Return]. After you have used this command, you are returned to the main Graph menu.

Reset

The Graph Name Reset command is used to erase all named graph settings in a worksheet. Before you use this command, double check the graphs and make sure you won't be using them anymore. Once the graphs are erased, they cannot be recalled.

Select the Reset command from the Graph Name menu (/GNR). All named graphs are erased from memory. As with the Graph Name Delete command, no confirmation is necessary. After you have selected this command, VIP Professional returns you to the main Graph menu.

If you use the Worksheet Erase command to erase a worksheet, all graph names will also be cancelled with it.

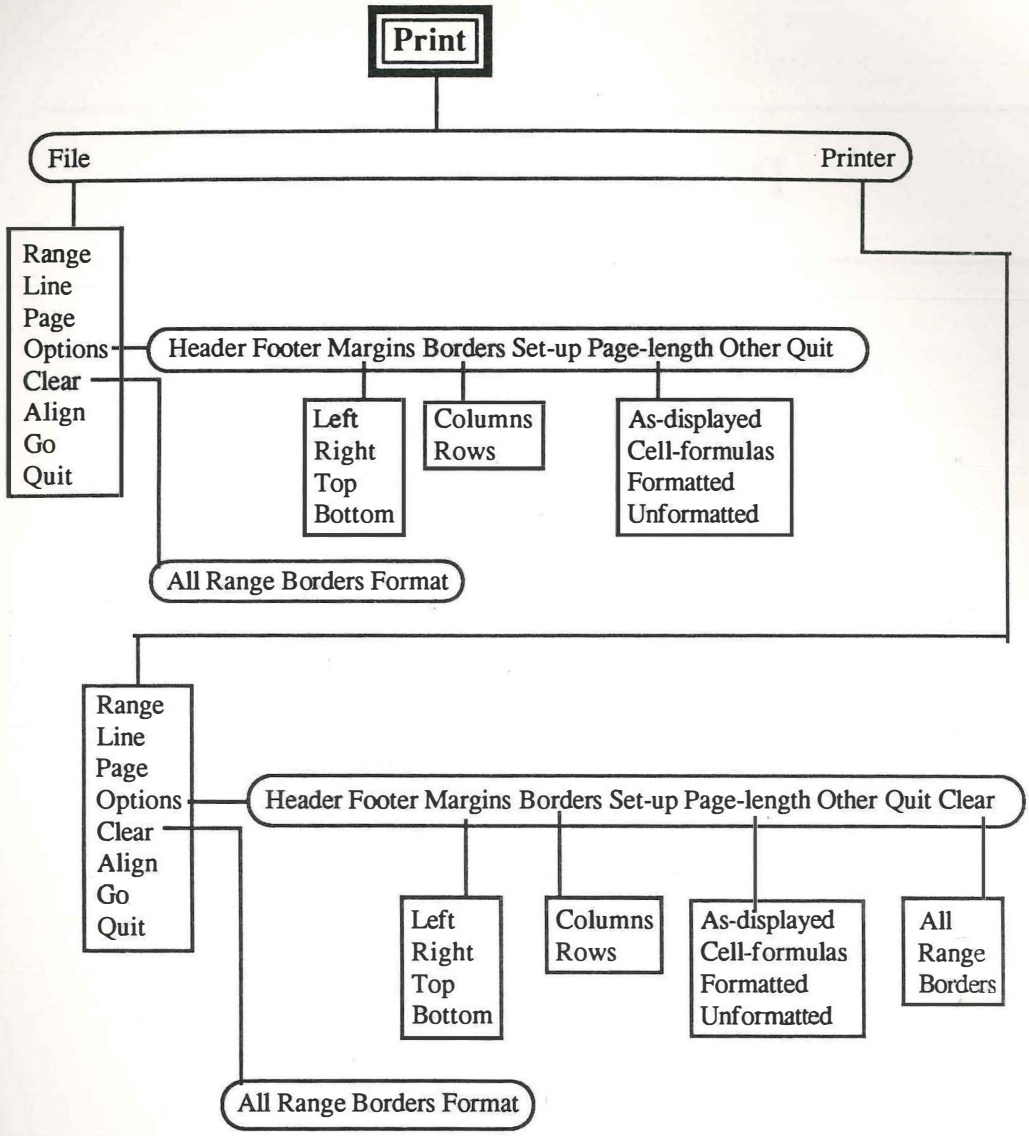
Graph Quit

The Graph Quit command allows you to leave the main Graph menu and return to the Ready mode. As you have noticed, once you enter the Graph menu, you will not leave it until you use this command or [Escape].

To use the Graph Quit command, choose Quit from the Graph menu (/GQ). This will return you to the Ready mode.

Print Commands

Print/File Range
Print/File Line
Print/File Page
Print/File Options
Print/File Clear
Print/File Align
Print/File Go
Print/File Quit


Print
File
Printer
Range
Line
Page
Options
Clear
Align
Go
Quit
Header Footer Margins Borders Set-up Page-length Other Quit
Left
Right
Top
Bottom
Columns
Rows
As-displayed
Cell-formulas
Formatted
Unformatted
All Range Borders Format
Range
Line
Page
Options
Clear
Align
Go
Quit
Header Footer Margins Borders Set-up Page-length Other Quit Clear
Left
Right
Top
Bottom
Columns
Rows
As-displayed
Cell-formulas
Formatted
Unformatted
All
Range
Borders
All Range Borders Format

Print Commands

Introduction

VIP Professional uses Print commands to prepare a printed version of a worksheet. The Print commands are used only to print worksheets. Before you print, you must make sure your printer is properly set up. Setting up your printer is controlled by the Desk menu. If you have problems, consult your *Atari ST Owner's Manual* . Print commands are not used to print graphs, the GraphPrint program is responsible for that feature.

Print commands allow you to obtain a printed version of your entire worksheet or only a part of it. The printed versions are known as "hard copy". Print commands also allow you to save your prepared copy for merging with another document using a text editor. If you decide to save your print-ready copy, VIP Professional saves your work in a print file. The contents of a print file look exactly like the hard copy version (complete with margins, etc.). This electronic version of a printout is known as "soft copy".

Of course, many Print commands are used to format the copy for printing or-—depending on the command—not to format it. Print commands are even used as a type of bridge to help in exporting and importing standard files from other programs.

Printing Now Vs. Saving to a Print File

The first choice you will have to make when you call up the Print menu is whether to print your work directly or whether to store it in a print file. You will make this choice by selecting Print Printer (/PP) if you want to print your work during this work session or by selecting Print File (/PF) if you want to save it to a print file.

When you choose Print Printer, you will be allowed to choose all the Print options you need to prepare your copy for printing. Then, when you choose the Go command, the worksheet (or range) with its settings and other Print command specifications are passed directly from the computer to the printer. The printer responds to the computer and makes a hard copy (or "printout") of your range. With the Go command, you also have several other commands (such as Align) which help with the positioning of the paper in the printer.

As the first step of the Print File procedure, you will be asked to select a name for your file. Naming files is described in the "File Commands" chapter. Your newly chosen file name will have the ".prn" file name extension added to it automatically. When you choose the Go command, your prepared copy will be stored to your current disk in a print file. Naturally, such commands as Align which help with the positioning of paper in the printer are not necessary at this point. However, if you do choose them, your choices will be remembered and saved with the file. When you are ready to print or export your file, you

must use a standard ASCII text (or word processing) program. Although you can use the File List command to check and see that your print file is saved, you are not able to display it using VIP Professional again.

A popular use of the Print File command is to create files which can be used in a word processor. The Print File command allows you to save a text version of your entire spreadsheet or just a portion of it. You can the load it into a text processor for letters or reports.

The Print Menus

Once you have chosen whether to save your work in a file or to print it, you will be placed in the main Print menu. The main Print menu appears at the top of the screen. It consists of these commands: Range, Line, Page, Options, Clear, Align, Go and Quit. Of these commands, Quit will take you out of the Print menu after a printing session. Range and Go are the only mandatory commands for printing. All other commands are optional.

Now that you are in the Print menu, the first thing that you'll want to think about is how much of your file you want to print and what it will look like. For one printing, or print file, you may use one or more ranges from a worksheet or the entire worksheet. If you want to print the whole worksheet, that will be your range. If it's a series of smaller ranges you want printed, you will have to specify each range of the series separately.

The worksheet or range(s) you decide on will become the objects of the other print commands. You can decide such things as what margins to use or if you want your copy to include headers or footers. In addition, you can decide whether to print your work as it is displayed or cell by cell, with underlying cell formulas instead of current values. After you've decided all this, you will send the range and its newly made settings to the printer or to the print file by using the Go command. Then, if you are printing a series of ranges, you can separate the ranges by a line or a page. You can even use a command to let VIP know that the top of the page is aligned on your printer.

The Procedure for Printing

There is a general procedure for printing which is described below. If you are using more than one range, the procedure is repeated for each range. Throughout the rest of this chapter we will discuss each group of commands in the order that it should be issued.

(After selecting Print Printer, or Print File and a name for the file...)

Step 1: Keeping in mind your desired print range, if you want to use certain options, specify them first. The options are: page format (Margins and Page Length), extra text (Headers or Footers), range borders (Borders), printing format (Formatted and Unformatted)

and worksheet documentation (As-displayed or Cell-formulas). There is an additional option area called printer control (Set-up). This option allows you to use a series of invisible characters to control such aspects of printer use as changing the typeface or changing the type size.

Step 2: Specify the print range.

Step 3: If you reload or adjust paper in the printer to start a new page, let the program know you have done so by selecting Align.

Step 4: At any point before using Go, you may select Clear to erase specifications you have set for range and options (individually or as a group).

Step 5: To send the contents of your computer's main memory to the printer or to the print file (depending on which you specified previously), select Go.

Step 6: If you are done and have no more ranges to prepare for printing, select Quit.

Or...

Step 7: If there are more ranges to be printed, decide if you wish to separate them from each other. If you specify Line, the ranges will be separated by one line. If you specify Page, each range will be printed on a fresh page.

At this point you may recycle the procedure, using a new range. If you are using the same options for the new range as you just did for the previous one, you can skip Step 1 and move directly to Step 2.

Print Options

As you saw in the above section, Step 1 of the printing procedure is choosing one, several, or none of the options available. In some areas, only one command or choice is available for options. In others, more than one command is available. All options are discussed in the order in which they were introduced in Step 1.

Your selections will be stored with your worksheet file if you save it. However, they will be returned to the default value if you erase the sheet. You may reset them for any new sheet that you create.

Margins

The Options Margins command allows you to set left, right, top and bottom margins for your printout. VIP Professional has its own initial default settings for margins which may

have been kept or changed with the Worksheet Global Default Printer command (see the "Worksheet Commands" chapter).

This command is particularly helpful in cases where you would change fonts. For instance, if you intend to use a compressed font, the margins would be different because they are measured differently. With a compressed font, the size of the character spaces (which are the unit of measurement for margins) has been changed dramatically. The default settings will be used whenever you do not supply your own margin settings with the Options Margins command.

The initial default margin settings for VIP Professional assume a standard 8 1/2" by 11" sheet of paper with 66 lines per page:

Left	4 spaces from left edge of paper
Right	76 spaces from left edge of paper
Top	2 lines from top of paper
Bottom	2 lines from bottom of paper

If you haven't changed the settings with the Worksheet Global Default command, these margins will be used. You may change one or more margin settings.

To change margins, select the Margins command from the Options menu (OM). Now choose which margin you want to set: Left (L), Right (R), Top (T) or Bottom (B). Specify the lines for top and bottom margins or the spaces for left and right margins by typing in the number and pressing [Return]. If you set the right margin, remember the number of spaces are counted from the left edge towards the right—not from right to left.

Actual settings for top and bottom margins are three more lines than those that are set if you use the optional headers/footers. The reason for this is that VIP Professional automatically reserves three lines for each. The first line is reserved for the header or footer itself. The additional two lines are reserved for two blank lines which separate headers and footers from the rest of the text. Therefore, if you are using continuous feed paper and have set the top and bottom margins to zero, each page of text will actually begin three lines below one perforation and stop three lines above the next perforation.

VIP Professional prints your ranges using the margins you select, or the defaulted margin settings. If the worksheet you created is wider than will fit within these margins, VIP Professional prints what it can from the worksheet. If there are labels which are too long, VIP Professional cuts them off at the right margin: If there are excess columns of values, VIP Professional prints them last, page for page.

Page Length

The Options Page-Length command is used to set the number of lines per printed page. The term "page length" refers to the total number of lines from the first to the last line of the sheet of paper. This command is particularly helpful if you are using non-standard type sizes or non-standard paper lengths.

VIP Professional uses an initial default value of 66 lines which is based on an 11 1/2-inch long sheet of paper using a standard type size. Using the Options Page-Length command, you can change the page length to any number of lines ranging from 20 to 100. If you don't use this option, or after you end a work session without printing or storing, VIP Professional automatically uses its own default value.

To select the command, choose Page-Length from the Options menu (OP). The current page length is displayed. To accept it, press [Return]. To change it, enter the number for the new page length and press [Return].

Headers or Footers

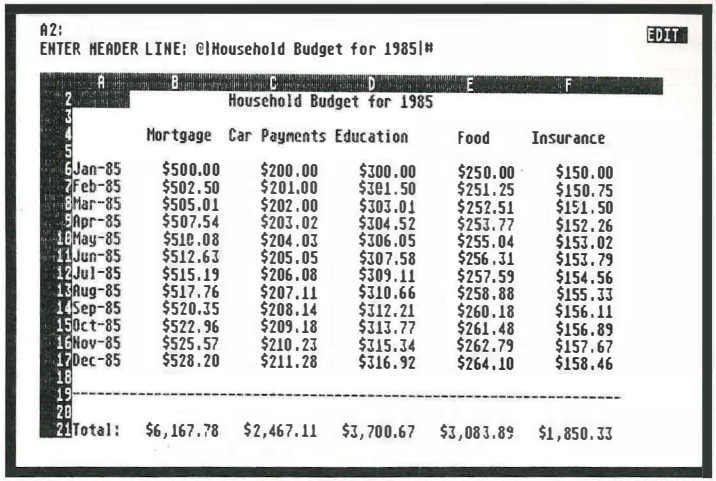
The Options Header and the Options Footer commands allow you to add one line each of additional text at the top (header) or bottom (footer) of your copy directly one line above the top margin and below the bottom margin. VIP Professional automatically adjusts the copy so that there are an additional two lines of blank space separating the headers or footers from the body of the copy. Not only can you add headers or footers, you can also decide whether they should begin at the left margin, be justified to the right margin, or centered on the page.

To select the commands, choose Header (OH) or Footer (OF) from the Options menu. When you are prompted to enter either a header or footer line, you may type in any desired text up to 240 characters long and press [Return]. We suggest that the line not exceed the margins you have set. VIP Professional automatically places you in the Edit mode while you write and revise your entry.

Your header or footer may be divided into up to three sections, one beginning at the left margin, one centered, and one right-justified. To create separate sections, divide the sections with a vertical bar ("|"). Each time you use a "|", VIP Professional will consider it a new section and position it as one section to the right of the previous one. If you begin a line with a "|", it will center the line. If you begin a line with two |'s, the line will be flushed right. A line which doesn't begin with a "|" will begin at the left margin.

If you reselect the Options Header or Options Footer commands after you return to the Options or main Print menu, you can edit or erase the header or footer when it is displayed beside the prompt.

Two items which are often included in a header or footer are the date and page numbers. Both of these can be automatically entered by VIP Professional either singly or together. When you type a number symbol ("#"), VIP Professional will replace it with sequential page numbers in hard or soft copy. When you type "@", VIP Professional will replace the symbol with the current date in your copy.



Three Part Header with Date on Left Using @, Text Centered And Automatic Page Numbering on Right Using #

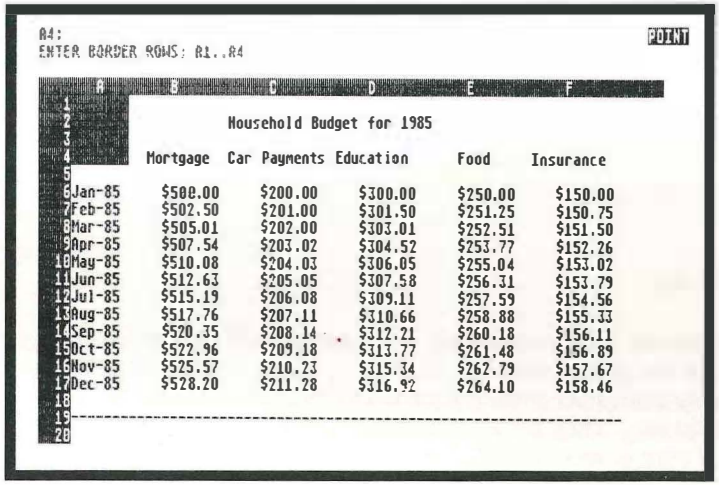
Borders

The Options Borders command allows you to provide a border along the left and/or top of each page of a printout. Columns or sections of columns chosen from the worksheet are placed at the left side of the page beside the corresponding rows to provide the left border. Rows or sections of rows are placed above corresponding columns to provide the top border. This command is mostly used for including column and/or row headings on each page of your copy.

To select the command, choose Borders from the Options menu (OB). Choose the type of border you want: Rows (R) or Columns (C). Then, select the border range. The border range is a range which covers the rows or the columns which you wish to use as a border. For example, if it is a series of rows you want to use as a border, move the cell indicator to the first row of your border series, press [.], then move the cell indicator to the last row and press [Return]. If you have used this command before, your last border range choice will be displayed. Press [Return] to enter your new range specification. When you specify the border range, be careful not to include areas from the range that are to be printed or you will have duplicated text from the areas they have in common.

When you print, the contents of rows which correspond with the column addresses of the print range provide a top border. For example, if columns A - F indicate the width of the print range and the border range is specified as row 1, the top border will include cells A1 to F1. The contents of columns which correspond with the row addresses of the print range are chosen to provide a left border.

If you return to the Options Borders command from the Options menu or from the main Print menu to examine your borders, do not use [Return] to quit the command. [Return] can break up a border if it is pressed while your cell indicator is on the border. [Escape] will take you back to the Options menu.



Setting Borders

Formatted and Unformatted

The Options Other Formatted and the Options Other Unformatted commands are used to format and unformat your copy by removing or adding certain format options and modifying the border option. The initial value is Formatted. Unformatted is often used to prepare a file for export to another program.

To select one of the commands, choose either Formatted (OOF) or Unformatted (OOU) from the Options Other menu. If you choose Unformatted, the copy will be printed without page-breaks, Headers or Footers. Borders will be printed on the first page only. If you choose formatted, the most recently specified (or defaulted) page-breaks, headers, footers and borders will be used as usual.

As-displayed or Cell-formulas

The As-displayed or Cell-formulas commands decide the appearance and contents of the printout by printing the worksheet as it appears or by printing the actual contents of each cell (cell by cell) as it was constructed. "As-displayed" is the initial value. "Cell-formulas" is usually used to get a printout of the formulas you've used in a worksheet.

To choose either command, select As-displayed (OOA) or Cell-formulas (OOC) from the Options Other menu. If you choose As-displayed, the copy will appear as it would normally in a worksheet.

If you choose Cell-formulas, the copy appears one cell per line. The cells are organized one row at a time (from top to bottom) and from left to right of the print range. Blank cells are ignored. Each cell-line contains the information that appears in the first line of the control panel when you are in that cell in the worksheet: cell address, format, protection status (if unprotected), and the actual cell contents. The actual cell contents are what was typed into the cell such as formulas (not their values), other values the way they were entered (that is, unformatted) and labels (including the label-prefix character).

Options Set-up

The Options Set-up command allows you to send preset instructions about type style, type size, etc. to the printer when you use Go to print a range. These instructions are a string of invisible characters entered from the keyboard which tell the printer what special features it should use. They are actually printer control codes and are determined by the requirements of your printer and by what available features you want to use. As such, they vary in both length and content. In addition, since the printer governs the features themselves, the characters used and even the features available will change from printer to printer. Please refer to Appendix D for a list of printer control codes and more information about their construction.

If you do not use this command, VIP Professional will use the global default set-up. The global default set-up initially set by VIP Professional is empty, but it may have been changed by you using the Worksheet Global Default Printer Set-up command.

To choose this command, select Set-up from the Options menu (OS). The current string of printer control codes will be shown. VIP Professional has automatically changed to the Edit mode. To use this string, press [Return]. To cancel it for this work session, press [Escape], then [Return]. You may edit it by using arrow, [Delete], and [Backspace] keys as well as inserting other characters.

The string of printer control codes can contain up to 39 characters. Each character is entered by typing in a backslash ("\") followed by a number of three digits. This is the decimal number of the character's ASCII code (see Appendix D for a listing of ASCII

codes). For example, the character, "Control-O" is number 15 in ASCII code. It would be typed in like this; "\015". Do not type in the character—always use the ASCII code. If a "\" is part of a control code, than type it twice (once to specify that you are beginning the character and once in decimal to include it with the code).

As we mentioned earlier, the characters you use in the string are those which will control the features of your printer; there is no standardization of printer control codes. To find which printer control codes work with your printer, look in the printer manual for its control codes. Then, if necessary, translate them to the "\" plus ASCII code format to enter them. Press [Return] to enter the string of characters.

When you use Go to print copy or to store it in a print file, VIP Professional will recall the printer control codes you have decided on for this work session and use them. If you have not specified any, it uses the default set-up.

You will probably notice that many printer-controlled options can also be controlled by VIP through the Print menu. When possible, use the commands of the Print menu instead of printer control codes. They tend to be easier to use and keep track of. For example, although you may set margins using printer control codes, it is better to set them using the Options Margin command.

Choosing the Print Range

The Print Range command is selected from either the Print Printer menu or the Print File menu before you select Go. If you are reprinting the most recently specified range, there is no need to select this command. Otherwise, the command must be used.

To use it, select Range directly from the main Print menu (R). Specify the range with your mouse or arrow keys or by typing the cell addresses or its range name. Press [Return] to enter it. When Go is selected, the range is printed or sent to a print file, as you have specified.

Align

The Align command is used to let VIP Professional know that you have reloaded or re-aligned the paper in the printer manually and that the printer is now at the top of a new page. If you don't use Align, VIP will not print any header you may have specified.

Before you use this command, position the paper in the printer. The printer should be at the very top of the page since the margins will be included automatically from that point. However, you may decide to move the paper a few lines down if the printing is unformatted (and therefore does not include margins).

To use the command, select Align from the Print menu (A). This will let VIP Professional know that it is at the top of the page. From this point, margins, page-breaks, etc. will be set according to specifications when you select Go to print.

Clear

The Clear command can erase the print range, headers, footers and borders. Margins, page-length, and printer control code set-up are returned to the Worksheet Global Default settings. The As-displayed format option is used. The Clear command can also be used to erase range, borders, or formats (in which margins, page-length, and printer control code set-up are included) individually.

To use this command, select Clear from the Print menu (C). Next, choose the object of the Clear command: All (A), Range (R), Borders (B) or Format (F).

If you choose All, the print range, headers/footers and borders are erased. Margins, page-length, and printer control code set-up are return to default settings and the As-displayed format option is used. No confirmation is necessary.

If you choose range, VIP Professional erases the most recent print range selected. If you choose borders, any borders set are erased. If you choose format, the page-length, margins and printer control code set-up items are erased.

Go

The Go command is used after you have selected any options you wish to use, a print range and, if you have positioned the paper manually, the Align command. It sends your prepared copy to the printer or to a print file, depending on whether you chose Print Printer or Print File to begin with.

When you are ready to send your copy to a printer or to a file, select Go from the main Print menu. Your prepared copy is sent to the printer or placed in a print file for storage. If you selected Print Printer, and the printer is not turned on or connected, the computer will beep and send you an error message. Press [Escape] to return to your position before issuing Go. Correct the problem and reissue the Go command if you still want to print.

You can stop printing before the printing of your prepared copy is completed by issuing a break ([Control][Undo]). The printing may not be interrupted immediately, because there still may be characters in the printer's own "buffer". These excess characters will be printed before printing comes to a halt.

After you have issued Go and printed your sheet, VIP Professional returns to the main Print menu so you can go through the printing cycle again.

Quit

The Quit commands (Q) back you up one menu each time you use them. For instance, if you are in the Options menu and you use Quit, you are moved back to the main Print menu. From the main Print menu, Quit moves you back to the Ready mode.

Advance a Line

The Line command advances the paper in your printer one line at a time so that you can create some space between different print ranges. To use the command, select Line from the Print menu (L). An extra blank line is created between the last print range and the one coming up. Each time you press "L" or [Return], an additional blank line is created.

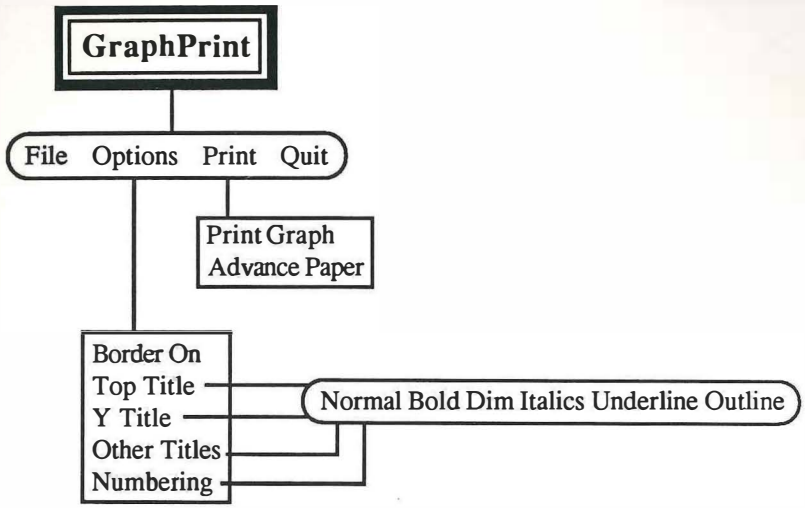
If you reach the bottom of the page, as specified by the margin and page-length settings, VIP Professional advances you to the next page. If you used the Footer option, the footer will be printed in the correct position before the page is advanced.

Advance a Page

The Page command advances the printer to the top of the next page after one print range, to begin the next print range. It is also a good idea to use this command after the last print range has been printed because VIP Professional remembers where the last print range ended. Unless you use the Align command, the program thinks the next print range will begin right below the ending line of the last print range. For instance, if you ended your last printing in the middle of a page, VIP Professional thinks the next printout begins from the middle of the page. Therefore, for the first page of the printing it will only print on what it thinks is the last half of the page left over from the last printing.

To use the command, select Page from the Print menu (P). After ending with a print range, VIP Professional fills the rest of the page with blank lines. Any footer chosen is printed at the bottom of the page. The paper is advanced to the top of the next page.

Appendices


GraphPrint
File Options Print Quit
Print Graph
Advance Paper
Border On
Top Title
Y Title
Other Titles
Numbering
Normal Bold Dim Italics Underline Outline

Appendix A
Using GraphPrint

Introduction

GraphPrint is an ancillary program which allows you to print the graphs you have created with VIP Professional and which you have saved in graph files (files with the file name extension of ".gph"). It allows you to choose such things as font style or whether or not to have a border around your graph before printing it.

Before you use GraphPrint to print your graphs, make sure that the computer is correctly configured to work with your printer. Configuring your printer is controlled by the Install Printer item of the Desk menu. This item is described in the *Atari ST Owner's Manual.* If you have any questions concerning your printer, contact your dealer.

Getting Ready to Use GraphPrint

When you are ready to use the GraphPrint program, save your current worksheet and graphs. Use the File Save (/FS) command to save the worksheet and the Graph Save command (/GS) to save your graph. Remember that the graph file must be saved separately in a file with a ".gph" file name extension to be printable. Use the Quit command (/Q) to exit from VIP Professional. Now load the GraphPrint program.

The main GraphPrint menu consists of the following items:

Item	Meaning
File	Selects a graph for printing
Options	Selects printing options (font, etc.)
Print	Sets the page position as "top of form" and prints
Quit	Quits GraphPrint

Throughout the rest of this chapter, each item will be discussed in the order of probable use. Items from this menu are selected with a mouse in a fashion similar to selecting items from the VIP Professional program.

Choosing a Graph for Printing

Once you are in the GraphPrint program, you will notice that the first item is File. When this item is chosen, the file catalog is called up. From the file catalog, you can select the graph you want to have printed. Choose it as you would any other file from the VIP program.

Options

The Options item is the next item found in the GraphPrint program. When you choose this item, you are preparing the graph you called up with File for printing. With Options, you can add a border around your graph and you can change the character style of your graph title or various other areas of text. Then, when you choose the Print command, your graph will be printed with these additional options.

Options has a menu of five commands: Border On, Top Title, Y Title, Other Titles and Numbering. In turn, Top Title, Y Title, Other Titles and Numbering offer the following choices: Normal, Bold, Dim, Italics, Underline and Outline. Both sets of commands can be chosen from the Options menu. A line physically separates the character styles from the five primary commands.

Border On

The Border On command is used to create a border for your graph. A border acts as a frame for your graph. GraphPrint will frame your graph with thick lines which form a rectangle. To use the Border On command, choose it from the Options menu.

Choosing Text Areas for Change

The Top Title, Y Title, Other Titles and Numbering commands are actually intermediary commands between the main item (Options) and the character-style choices. They decide the target of the character style(s) which are chosen next. If you choose the Top Title command, then the character style you choose with it affects only the first, or primary title of your graph. If you choose the Y Title command, than the character style you choose with it will affect the Y-axis title of your graph. The Other Titles command affects such things as the second title line and the Graph X labels and the Numbering command affects the numbering alongside the graph.

Choosing the Style of Characters

Once you've chosen a Title(s) or Numbering command, you will have a choice of character style for the targeted text. Character style does not affect your font type. The program

continues to use the font style supplied by your computer. What choosing a character style does do is change the appearance of characters by emphasizing or de-emphasizing an aspect of their appearance. There are six options of character style available:

Normal: The normal option uses the style usually used by your computer and printer for printing.

Bold: The bold option uses a boldfaced style for your characters. Although you are not changing the size of lettering with this command, because the printing of the characters is thicker, they will require a little more space when they are printed.

Dim: The dim option prints the characters of your choice finer than is usually used by your computer and printer. Because of this, the characters require a little less space than usual.

Italics: The italics option prints your characters in italics.

Underline: The underline option underlines all the characters in each word or single letter or number.

Outline: The outline option draws an outline around each of the characters of the text. Like Bold, it requires a little more space for its characters.

Print

The Print Menu contains two commands: Print Graph and Advance Paper. The Advance Paper command is used to tell the program that the paper in the printer is at top-of-form. The Print Graph command is used to print the graph once it has been completely formatted.

Advance Papering Your Page for Printing

Before you print your graph, or between printing graphs, make sure that the paper in the printer is in the correct position for printing. Remember that your printer will add all margins, etc. from what it considers the top and left sides of the page.

The Advance Paper command is used to tell the GraphPrint program that the top of a new page is aligned with the print head. You can use the printer's controls to advance the paper until it is in the position you want. Then, select Advance Paper. This tells GraphPrint that the current position of the paper is to be considered as the top of the sheet. Each following page in the print series will be begun at exactly where the last printing left off, unless you use the Advance Paper command again.

Printing the Graph

When you choose Print, the program will send your graph and its settings to the printer. In response, the printer will print out your graph. The Print command requires no affirmation before it prints your graph.

If your printer does not print your graph, make sure it is turned on and ready for printing. You might also want to check that the printer configuration is correct on your computer. This can be done through the Install Printer item of the Desk menu.

Once you've checked your printer and the printer configuration on your computer, you may come back to GraphPrint and try printing out your graph again.

Leaving GraphPrint

The Quit command allows you to leave GraphPrint when you are ready. To use the command, select Quit. You will be asked to confirm your decision before you exit GraphPrint.

Appendix B

Reference Works

No manual can hope to completely cover the variety of functions which electronic spreadsheets may serve. Many works have been written to help teach how to create and use worksheets. Others have been written giving numerous templates for general and special worksheets. The following is a short list of useful reference works which we recommend if you should have any questions about worksheets in general or special templates.

Baras, Edward M.: *Osborne/McGraw-Hill Guide to Using Lotus 1-2-3*: McGraw-Hill Book Co.: Princeton Road, Hightstown, NJ 08520: 1984

Bingham, Julie E.: *1-2-3 Go!*: Addison-Wesley Publishing Co.: Jacob Way, Reading, MA 01867, (617)944-3700: 1984

Flast, Lauren and Flast, Robert: *1-2-3 Run*: Osborne McGraw-Hill Co.: Berkeley, CA 94710: 1985

Haynes, John L.: "Circuit Design with Lotus 1-2-3": *BYTE Special IBM Issue* (Vol 10, No. 11): McGraw-Hill Inc.: Peterborough, NH 03458: November, 1985

Helliwell, J. , Petzold, C., Poor, A. and Riddington J.: "Surveying the Resources: A 1-2-3 Training Compendium": *PC Magazine* (Vol. 4, No. 16): Ziff-Davis Publishing Corp.: New York City, NY 10016: 6 August 1985

Kling, Bill: *The ABCs of Lotus 1-2-3*: Scott, Foresman, and Co.: 1900 E. Lake Avenue, Glenview, IL 60025, (312)729-3000: 1985

Krakow, Ira: *Lotus 1-2-3 Self-taught on the IBM PC* : Brady Communications Co., Inc.: Route 197, Bowie, MD 20715, (301)262-6300: 1985

LeBlond, Geoffrey T. and Cobb, Douglas F.: *Using 1-2-3*: Que Corp.: 7999 Knue Road, #202, Indianapolis, IN 46250, (317)842-7162: 1983

Ochi, Kaz and Hughes, Patricia J.: *Accounting with Lotus 1-2-3*: Wadsworth Electronic Publishing Co.: Belmont, CA: 1983

Ridington, Jr., Richard and Williams, Mark: *The Hidden Power of Lotus 1-2-3: Using Macros:* Brady Communications Co., Inc.: Bowie, MD 20715: 1985

Starz, Richard: *Working with 1-2-3 on the IBM PC and Compatibles*: Harper & Row: 10 E. 53d Street, New York, NY 10022: 1985

Appendix C

How to Use Lotus 1-2-3 Files With VIP Professional on Your Atari ST

VIP Professional and Lotus 1-2-3 worksheet files (with the file name extension, ".wks") are 100% compatible with one another. One minor detail to watch for when transferring files from program to program is the smaller worksheet size of the Lotus 1-2-3, version 1A. Because that version only uses 2048 rows in a worksheet, the worksheet file you transfer from VIP should be restricted to that size also. There are basically two ways you can go about transferring files. The first is by using a telecommunications program to transfer Lotus files from another computer or from an information service such as CompuServe. The second way is to connect an IBM PC-compatible, 5 1/4" disk drive to your Atari system.

To transfer the files using a telecommunications program, follow the instructions in the program's manual for uploading and downloading (receiving) between the programs. Remember to check the configurations you set with the Set RS232 Config. item from the Desk menu. Of course, when you use a modem, you may also transfer files with the help of an information access system such as CompuServe.

To transfer Lotus files for reading by VIP on Atari, hook an IBM compatible, 5 1/4" floppy disk drive up to your Atari system. The files you transfer must be on disks which are formatted from DOS 2.0 or a later version of PC or MS DOS. There have been articles written on how this is done. See the November, 1985 edition of *Antic Magazine* (524 Second St., San Francisco, CA 94107). You may also consult your dealer or user-group for help with this. Once your system is hooked up, turn it on and load your files from Lotus just as you normally would.

If you should have any questions about hooking up an IBM compatible disk drive to your Atari system or about using a telecommunications program with Atari, contact your Atari dealer for information.

Once transferred, these files may be used just as other worksheet files are. Additional data input, editing, combining and extracting portions, using data commands and graphing work exactly the same on these files as they do on files originally created with Professional.

Appendix D

Introducing ASCII

When you use the Data Sort command, records are sorted in ascending or descending order (see the section on Data Sort in the chapter, "Data Commands"). Labels which are in the sort range are sorted in ASCII order. The other cells are sorted as specified in the Data Sort section. Whether you choose ascending or descending (which reverses the order) is up to you.

In addition to using this list to determine ASCII order for the Data Sort command, you may also use the list to find the decimal code for printer set-up string characters. Use the printer manual to find which (keyboard) characters you want to use, then convert them to three-digit decimal numbers. Each three-digit number is always begun by a backslash ("\"). With numbers from the list below which only have one digit, precede the number with two zeros. For example, ASCII decimal number, "0" is written as "\000". With numbers from the list below which have only two digits, precede them with one zero (for example, "10" is written as "\010").

ASCII Decimal No.	Keyboard Character
0	[Control]@
1	[Control]A
2	[Control]B
3	[Control]C
4	[Control]D
5	[Control]E
6	[Control]F
7	[Control]G
8	[Control]H
9	[Control]I
10	[Control]J
11	[Control]K
12	[Control]L
13	[Control]M
14	[Control]N
15	[Control]O
16	[Control]P
17	[Control]Q
18	[Control]R
19	[Control]S
20	[Control]T
21	[Control]U
22	[Control]V
23	[Control]W
24	[Control]X
25	[Control]Y
26	[Control]Z
27	[Escape]
28	FS
29	GS
30	RS
31	US
32	[Space]
33	!
34	"
35	#
36	$
37	%
38	&
39	'
40	(

41	)
42	*
43	+
44	,
45	-
46	.
47	/
48	0
49	1
50	2
51	3
52	4
53	5
54	6
55	7
56	8
57	9
58	:
59	;
60	<
61	=
62	>
63	?
64	@
65	A
66	B
67	C
68	D
69	E
70	F
71	G
72	H
73	I
74	J
75	K
76	L
77	M
78	N
79	O
80	P
81	Q
82	R
83	S
84	T
85	U
86	V
87	W
88	X
89	Y
90	Z
91	[
92	\
93	]
94	^
95	_
96	`
97	a
98	b
99	c
100	d
101	e
102	f
103	g
104	h
105	i
106	j
107	k
108	l
109	m
110	n
111	o
112	p
113	q
114	r
115	s
116	t
117	u
118	v
119	w
120	x
121	y
122	z
123	{
124	|
125	}
126	~
127	[Delete]

Glossary

Absolute Reference: A way of referring to the contents of a cell or range of cells located at a particular set of coordinates for use as values in a formula.

Active: Currently in use.

ASCII: A standard American computer code consisting of the 128 characters available on a computer. The acronym stands for American Standard Code for Information Interchange.

Cell: One of the small, rectangular areas which make up a worksheet. It acts as a receptacle for data entry or as a starting place for invoking commands.

Cell Address: The coordinates of a cell, decided by its column letter and row number.

Cell Indicator: The marking which shows the current cell. It shows the cell as a shaded area, different from other worksheet cells.

Cell Pointer: In the GEM version of VIP, the symbol which traces the movement of the mouse across the screen. It changes shape according to what it is used for: a cross while in the worksheet window, an arrowlike pointer outside the worksheet, a grooved box or "grabber" when by the top and left border lines, or a busy bee when waiting for a command to be processed.

Character: A letter, number, punctuation or other special mark which can be used in text.

Clear: Erasing or deleting data or a command.

Click: With a mouse, pressing down and letting up quickly on the mouse key to make a selection or choice.

Column: A vertical area which is one cell wide and ranges from the top to the bottom of the worksheet. Each column is designated by a letter.

Command: An instruction from you to your computer to perform an action.

Configuration: Settings which determine screen or print format or which provides information for and about the disk drives or printer.

Current: Presently active and usable.

Cursor: In the Value, Label or Edit modes, a line which underscores the position of the next possible character on the Entry or Status lines.

Database: A worksheet which has been arranged in a series of records and organized into fields. Databases are used for data management.

Default: A command or setting which is automatically assumed and does not need to be specified.

Display: What is visible on the screen.

Enter: Signal to the computer that you have finished specifying or selecting information and that you are ready to have the computer process it. You may enter the contents of a cell, or a command or prompt response by using [Return] or clicking the mouse, etc.

Entry: A piece of data (label, value or formula) which has become the contents of a particular cell.

Error Message: A short message which is displayed on the screen in response to the inaccurate usage of a command.

Field: A column or cell in a database representing one facet of information.

File: A unit which can be saved and retrieved separately from others. There are three types of files: worksheet, print and graph.

File Name: The name given for identification to a saved worksheet, graph or print file.

Format: The way in which the contents of a cell are displayed or the way a printed page will appear.

Formula: A calculation using operators and/or functions. It can be performed on freestanding values or on other cells' contents. Because formulas result in numerical values, they are considered a subdivision of values.

Function: 1. An action performed by the computer. 2. One of the ten special functions, each of which supplements or parallels commands from various aspects of the program. 3. One of the @ functions whose basic use is to assist with various calculations.

Global: Affecting the entire worksheet.

Graph: A visual presentation of data from a worksheet. There are five types available with VIP Professional: Bar, Stacked Bar, Pie, Line and XY.

Icon: A small figure displayed on the screen which is used to represent a function or serve as an indicator.

Label: A textual entry or one which is treated as a textual entry in the worksheet. Labels are generally used to explain values in a worksheet.

Memory: A measurement of the capacity a device has for storage of data.

Menu: A group of related commands which can be displayed in the menu area.

Mixed Reference: A way of referring to the contents of a cell by its coordinates as a formula value. The reference is half absolute (remains stationary no matter where the formula is moved) and half relative (changes its position in direct correlation to changes made in the placement of the formula). If the column is relative, then the row is absolute, and vice versa.

Mode: A particular way of processing commands and using them to promote a certain type of action. Some important modes of VIP Professional are: Ready, Value, Label, Point, Edit and Menu.

Mode Indicator: An area on the screen reserved for the name of the current mode.

Name: A way of referring to the contents of a cell (range name), a file (file name) or a field in a database (field name).

Point: With a mouse, placing the cell pointer over the location or the icon which you intend to select.

Press: With a mouse, holding down the mouse key while the cell pointer remains over the area or icon of your choice.

Program Disk: The disk which carries the VIP Professional program.

Protection: A feature which allows you to prevent reentry in a cell, a range or an entire worksheet so that no editing changes can be made.

Range: A group of contiguous cells or a single cell of a worksheet which can be used in a command procedure.

Recalculation: The process in which VIP Professional calculates the formulas of a worksheet after changes have been made to it.

Record: All the information from a single source arranged in one row of a database.

Relative Reference: A way of referring to the contents of a cell through its cell coordinates for use as a value in a formula. Any changes made to the position of the original formula cell will result in corresponding changes in both coordinates of the reference.

Reset: Erasing certain command selections and returning to initial settings.

Row: A horizontal area which is one cell high and goes from the left to the right side of a worksheet. Each row is designated by a number.

Select: To choose a menu command by using your mouse, your arrow keys or by typing initial letters.

Special Functions: A set of ten functions which perform actions to help with various aspects of VIP Professional. They can be reached from the keyboard or from the VIP menu.

Spreadsheet: The form used for creation of a piece of financial, business or statistical work, such as a budget or a database.

System Disk: The disk which contains both the VIP Professional program and the GraphPrint program.

Table: A type of chart often used in financial analyses. A table includes variables and/or constants and shows the results of their calculations.

Text: A series of characters which is usually not meant to be interpreted numerically or result in numerical values. This includes titles and other fact-giving information.

Value: A form of entry which is numerical or can result in a numerical value.

Window: An area on the screen which shows a graph or a certain section of your worksheet. Split-screen windows refer to splitting the worksheet window so that two separate areas of the worksheet can be visible simultaneously.

Worksheet: The area available to you for data input.

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