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plus/4

Integrated Software Manual

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INTRODUCTION

Congratulations! The Commodore microcomputer you have purchased continues our commitment to give our customers more computing power for their money than any other microcomputer manufacturer. The Commodore Plus/4 represents a new standard in personal computing.

The software integrated into your new computer is specifically designed to further the Commodore Commitment. There is a tremendous amount of publicity being given to the software industry today. Most of this is a little hard to relate to for the "first time" or casual computer user. Words like "Word Processing, Database and Spreadsheet Analysis" are frequently tossed about with little concern that they may mean different things to different people.

We have taken special care in the design and creation of your new Plus/4 computer. You now have a Word Processor, a Spreadsheet, a Filing system and Graphics all available at the touch of a button. Each program inside the Plus/4 has been documented in easy-to-learn tutorial fashion. Great care was taken not only to show how the programs operate but to try to impart the "why" as well. This manual contains several practical examples that are useful in everyday life.

It is a first that this many powerful and full-featured programs can be made available, built in a microcomputer of this size and price. Similar integrated products exist in the software

marketplace only on computers costing many times more and needing about four times the memory.

When we use the word "integrated" we are saying two things. One, that these programs are integrated into the computer itself. Two, that they are able to share information between them dynamically. This means that at the touch of a button you may do things like take information from the Spreadsheet and incorporate it into a letter you have in progress in the Word Processor.

Designing this much software with these integrated features into a computer like the Plus/4 has been a challenging experience. Someone made the comment that after this we should move on to something simple, like building large ships in small bottles.

Thank you for taking the time to look over this introduction. You will find that we have placed a short note at the beginning of each section of this manual as a "get acquainted" feature to that particular software product. The entire Commodore Software Company feels proud of what we have accomplished in the new Plus/4 computer and we hope you have as much fun using it as we did making it.

Thank you.

Paul Goheen

Paul Goheen
Director, Applications Software

ORGANIZATION OF THIS MANUAL

The Plus/4 manual is organized by functions into the following chapters:

- Word Processor
- Spreadsheet
- Graphics
- File Manager
- Reference
- Appendix A—Disk Formatting/Disk Precautions
- Appendix B—Sample Applications
- Index

The Word Processor, Spreadsheet, Graphics, and File Manager chapters each contain a self-teaching guide so you can learn how to use your Plus/4 by actually entering data. The self-teaching guides are organized by lessons, which are broken down into exercises. At the beginning of each lesson, you are told what the lesson will teach you. The exercises show actual examples of the concepts outlined in the beginning of the lesson.

The Reference chapter summarizes and expands the information contained in the previous chapters. It can be used as a guide to a specific command or idea once you have performed the exercises in the self-teaching guide.

Appendix A explains how to format a diskette. Diskettes are used to store information and must be formatted before data can be stored on them. Also included are some tips on how to care for your diskettes.

Appendix B contains some sample Spreadsheet and File Manager examples.

CONVENTIONS USED IN THIS MANUAL

Throughout this manual, you will be told to press certain keys or hold down a key and press another key. The following list contains the conventions used in this manual to represent certain keys.

Convention	Means
RETURN	Press the RETURN key. Almost every operation requires that you press this key.
CURSOR RIGHT CURSOR LEFT CURSOR UP CURSOR DOWN	Press the corresponding arrow key located in the lower right corner of your Plus/4.
C= C C= F C= T C= N	Press and hold the C= key and then press the subsequent letter. In Plus/4, the C= key acts like the shift key on a typewriter.
Bold Face Words	Data that you type into the computer.

WORD PROCESSING

The term "Word Processing" really describes what we are going to talk about in this section: Processing words into sentences, paragraphs, entire letters or even chapters in a book.

When the software is activated inside the Plus/4 computer, you are placed into the Word Processor for two reasons. One, it will probably be the program that is used most often. Two, it is the easiest to learn.

Since all of the editing commands of this word processor are preset to print on a normal-sized sheet of paper, you can use the program like it was a typewriter. You will notice that as you type over to the right edge of the screen, the entire screen will move left like the carriage in a typewriter. The RETURN key acts like a typewriter as well. Need a blank line or want to space over to indent? . . . just use the RETURN key or the space bar!

This word processor contains the essential features found in all word processors. We have tried very hard to make sure every needed function is here so the accomplished user is satisfied and yet the casual user finds the program easy to use. This combination of features also provides the educational community with a product that encourages word processing at an early age.

Remember, word processing is just another term for having a very smart typewriter. The ability to correct mistakes, replace words and phrases, shuffle paragraphs and save your documents for reprinting soon will make the typewriter obsolete. We have tried to make sure these concepts will become second nature with just a little practice.

This word processor, like most software products, is like a muscle. The more you exercise it, the better it responds to your commands. You will notice that after a short time you will be using several of the features without even thinking about them.

Please take your time in reading the tutorial. Remember, practice may not always make perfect, but it surely helps.

INTRODUCTION

This section of the manual introduces you to the Plus/4 word processor. If you don't know what a word processor is, a brief word processing overview has been included. This overview will help you understand some basic word processing concepts.

The best way to learn about a word processor is to use one. That's why the bulk of this chapter is a self-teaching guide that will instruct you how to use and take advantage of the features and functions Plus/4 provides. You will learn how to enter and edit documents and get the most from your Commodore Plus/4 word processor.

A summary of all the material covered in the self-teaching guide is also provided. The summary functions as a reference guide to your Plus/4 word processor.

WHAT IS A WORD PROCESSOR?

A word processor is a tool that allows you to enter, edit, print and store text, using a computer. The main advantage of a word processor is that it can save you many hours of retyping. With a word processor, you type electronically onto a video display screen or television. When you are satisfied that your document is ready, you can print it.

The text you type is first stored in your computer's memory and later on a magnetic diskette. If you make a typing mistake, correcting it is easy. You don't have to retype your entire document, but only need to correct the error as you will see in the examples in the self-teaching guide.

A word processor also allows you to change the format of your document without retyping. By inserting a few simple instructions in your text, you can, for example, change the margins. No additional typing is required.

Finally, the documents you type with your word processor can be saved on a diskette. Saved documents may be recalled and used again. They may also be revised.

The final result is that with a word processor, you will be able to type less and produce more and better quality documents.

SELF-TEACHING GUIDE

Using Plus/4's word processor is easy. You type your text like you would with a typewriter. In addition, you have at your disposal several ways to tell the word processor to do special things with your text such as changing margins or beginning a new page. Unlike a typewriter, you don't have to press the RETURN key at the end of each typed line. You only need to press RETURN at the end of a paragraph. The word processor takes care of line spacing automatically with a feature called word wrap. Word wrap makes sure the printed result of your typing looks good.

In this section of the manual, we provide exercises that show you how to use Plus/4's word processor. Each lesson of this self-teaching guide builds on material presented in the previous lessons. We recommend that you type in all the exercises and examples. Once you have mastered the examples provided here, you should have little trouble using the word processor for your own documents.

All the features of the word processor are not explained in the self-teaching guide. They are explained, however, in the summary at the end of the chapter and in the reference section.

Unless you are an experienced word processor, don't try to complete this self-teaching section in one sitting. Go slowly and practice each new operation several times. At the end of each lesson, you will find brief summaries of the material covered in the lesson. These summaries provide good stopping points, where you can practice on your own. Once you have mastered one aspect of the program, then continue.

GETTING STARTED

1. Make sure your computer, disk drive, printer, and monitor or television screen are connected properly and turned on.

2. To perform the exercises in this guide, you will need a formatted diskette. See Appendix A or your disk manual for instructions on how to format a disk.

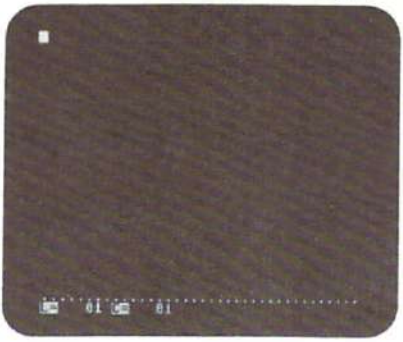
3. Activate the Plus/4 software by pressing the **f1** key. After the SYS message is displayed, press **RETURN** .

LESSON 1 THE KEYBOARD AND THE SCREEN

In this lesson you will learn:

- ☐ How the screen is organized.
- ☐ What the screen window is.
- ☐ How to use the cursor keys to move around within a document.
- ☐ What the RETURN key does.
- ☐ What the INST/DEL key does.
- ☐ What the SHIFT RETURN, f1, and f2 keys are used for.

When you activate the Plus/4 software, you initially see a screen that looks like the photograph below.



In the upper left corner of the screen is a solid white block called the cursor. The cursor indicates where you are typing in your document. As you type, the cursor will move forward one space.

Exercise 1 Cursor Movement

1. Type the following:

   as i type the cursor moves

   (If you make a typing mistake in this exercise or the next three exercises, don't worry about it. Eventually, you will learn how to correct errors.)

Notice that everything you just typed was in lower case. Like a typewriter, the Plus/4 word processor uses upper and lower case letters. To create an upper case letter, you simply hold down the SHIFT key and type the letter.

Exercise 2 Capitals

1. Press the RETURN key and type the following:

   As I type the cursor moves

When you pressed RETURN, a small arrow was inserted in the text and the cursor moved to the left of the screen. This arrow means that the next line of your typing will start on a new line when the text is printed. You will see how this works in Lesson 2.

As you typed, the numbers at the bottom of the screen changed. Right now the number after the L (which stands for line) should be 02 because the cursor is on the second line of the document. The number after the C (which stands for column) should be 27 because the cursor is at the 27th column of the document.

A Plus/4 document can have a maximum of 99 lines with 77 characters per line. Only 37 columns and 22 lines are displayed on the screen at one time.

The line and column indicators at the bottom of the screen provide you with a constant update of the cursor's position.

Pressing the RETURN key moves the cursor to the left margin. The cursor keys at the lower righthand corner of your Plus/4 can also move the cursor.

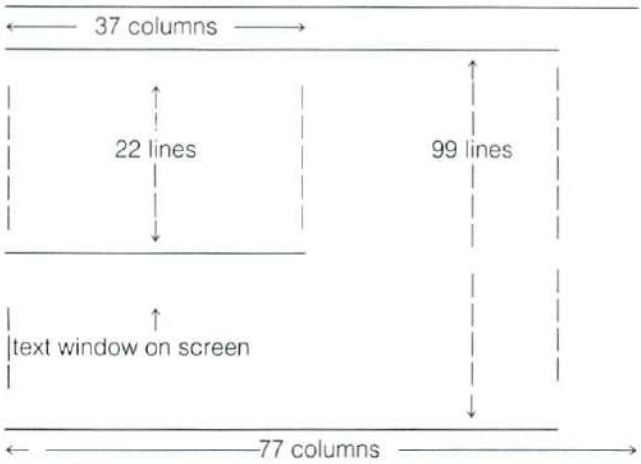
Exercise 3 More Cursor Movement

1. Press the cursor right key until the cursor is at L=02 and C=01. Notice that if you hold this key down, the cursor will move continually.
2. Press the cursor right key until the cursor is at L=02 and C=27.
3. Press the cursor down key until the cursor is at L=20 C=27.
4. Press the cursor up key until the cursor is at L=04 C=27.
5. Hold the SHIFT key down and press RETURN . The cursor should be at L=05 C=01.
6. Type the following:

   The cursor keys move the cursor. RETURN

In the last line you typed, the cursor moved to column 33. A Plus/4 document can have 99 lines of 77 characters per line. At any given time, however, only 37 columns and 22 lines are displayed on the video screen. Plus/4 uses a technique called **scrolling** to display all 77 columns and 99 rows. The screen display functions as a window to the entire document. As you move the cursor around the screen, the line and column indicators are constantly updated and always tell you where the cursor is in your document.

The cursor keys allow you to move (or scroll) the text window up and down and back and forth.



Exercise 4 The Screen Window

1. Hold down the cursor right key and watch the text window change. The column indicator at the bottom of the screen also changes as you move the cursor. If you are ever unsure about where you are in a document, check the line and column indicators.
2. Press f1 .
3. Press f2 and note the column indicator at the bottom of the screen.
4. Type the following:

   This text begins at column 41. RETURN . When you press RETURN , the text you just typed will disappear from the screen because the cursor moves back to column 1. The text is still in memory, but it is not displayed.

When you move the cursor to column 1, if you press the cursor left key, the cursor will move up to the last column of the previous line. Pressing the cursor right key at this point will move the cursor down to the first column of the next line.

If you are a good typist, you probably haven't made any typing mistakes in the first four exercises. However, if you are like most of us, you probably mistyped something along the way. One of the big advantages of the Plus/4 word processor is the ease with which you can correct mistakes. Using the cursor keys, you can position the cursor at the mistake and use the INST (Insert) or DEL (Delete) keys to correct the mistake.

Exercise 5 Insert and Delete

1. Position the cursor at L = 09 C = 01.
2. Type the following text carefully. (There are intentional typing errors.)

   It is easy to us the inserrt and delete keys to correct erors.

   (The text window moves as you type.)
3. Use the cursor left key and position the cursor over the "o" in "erors."
4. Hold the SHIFT key down and press the INST/DEL key once.
5. Type an r in the space that opened up.
6. Use the cursor left key and position the cursor over the second "r" in "inserrt."
7. Press the INST/DEL key once to delete the "r."
8. Use the cursor left key and position the cursor after the "s" in "us."
9. Hold the SHIFT key down and press INST/DEL once.
10. Type an e.

Accidentally pressing the RETURN key terminates a line. To move the cursor back to the left margin, use SHIFT RETURN or f1.

The INST and DEL keys allow you to insert characters anywhere in your document. The word processor will automatically bump your text down to the next line if you are making a large insert. Conversely, if you are deleting a large

amount of text, the text below the deletion will automatically be pulled up to the line you are working on. To avoid confusion, the delete key will only delete to the edge of the current screen window.

Summary

A Plus/4 document can have 99 lines of 77 characters each. Only 37 columns and 22 lines of text are displayed on the screen at one time.

The cursor indicates where you are in a document.

The cursor keys allow you to move in all directions through your text. The insert and delete keys allow you to add space for additional text or delete text.

The RETURN key is used to terminate a line and force a new paragraph.

LESSON 2
A SAMPLE DOCUMENT

In this lesson you will learn:

- How to type and edit a document.
- How to activate command mode.
- How to delete a document from the screen.
- How to save a document on disk.

Now that you have learned how to move the cursor around and how to use the insert and delete keys, you are ready to type your first real document. Our sample document is a simple letter. However, before we enter the letter, we need to delete the text entered in the previous lesson.

You could use the Delete key and delete each character on the screen until you had a blank page. Needless to say, that would be quite tedious and a word processor is supposed to reduce tedium. A better way to delete the text would be to simply tell the word processor "Delete what is on the screen." Unfortunately your computer doesn't understand your talking. However, there is a way to give your Plus/4 word processor commands to do things like deleting text.

Normally, when you interact with your Plus/4 word processor, you simply type in text, which then is displayed on the screen. However, by pressing and holding the C= key and pressing C, you are able to give the word processor special commands. These commands are usually one or two letters that tell the Plus/4 word processor to perform a special function (such as deleting a document). Once your word processor has completed the function you requested, you can go back to your normal typing.

At any time during normal text entry, pressing C= C activates command mode. Command mode is used to tell the Plus/4 word processor to perform special tasks.

Exercise 6 Clear Memory

1. Press C= C. The cursor moves to the bottom of the screen. W> is a prompt that tells you that you are in command mode in the word processor. At this point, Plus/4 is waiting for you to type in a command.

2. Type: **cm** RETURN . CM is a command that stands for **C**lear **M**emory.

3. At CLEAR ALL Y/N?, pressing y will delete the document from the screen. Pressing n will allow you to back out of the option.

Command mode is always activated by pressing C= C. When you press C= C, the cursor moves to the bottom of the page and the command prompt "W>" is displayed. When the prompt is displayed, you can type your command or press RETURN by itself to exit command mode and return to normal typing.

Now that we have a clean document area, we can begin with our first real document.

Exercise 7 Sample Document

Type the following letter. Use the cursor keys and the Insert and Delete keys to correct spelling mistakes. The "←" in the text means press the RETURN key.

June 5, 1984←
←
←
Dear Uncle Paul and Aunt Pat,←
←
After a beautiful drive through the mountains, we arrived home safely at about 9:00 last night. You were right, the mountains are breathtaking this time of year. The mountain laurel was just starting to bloom and the leaves on the trees were green.←
←
Thank you very much for the wonderful hospitality you extended to Carole and me for the past week. Now that we are back here in the city, we would like to invite you to come spend a few days with us here. There are some great concerts coming up this summer and we know how much you two like music. See, there are some advantages to living in the "civilized" world.←
←
Anyway, thanks again for a wonderful time.←
←
With love,←
←
←
Tom←
←
←
P.S. I'll send you the pictures of the trout Paul caught as soon as I get them developed.←

Whenever a document is entered without formatting commands, the following standard margins are used:

- left margin—0
- right margin—77
- page length—66 lines

You probably noticed as you typed in this letter that word wrap was not activated. Word wrap is a feature that makes sure words are not split between lines. Consequently, words like "about" or "time" are split in the middle. However, when your document is printed, the word wrap feature is implemented and no words are split. If you printed this document at this point, the standard margins described above would be used.

Before we print the document, we want to store it on disk for future use. In the upcoming lessons, we will be using this document again. Saving a document on disk is accomplished through command mode.

Exercise 8 Saving a Document

1. Make sure you have a formatted data diskette in your disk drive.
2. Press C= C.
3. At W>, type: sf RETURN .
4. At SAVE FILE:, type: letter RETURN . The disk will spin and the document will be permanently saved.

Documents saved on disk are called files and must have a name (at least 2 and up to 16 characters). Once a document is saved on disk, you can delete it with the CM command and still be able to retrieve a copy of the document from your diskette. It is a good idea to always save a document before you print it.

Sometimes when you try to save a document, the word REPLACE? appears on the command line. This is because there is an old file on the disk with the same name you chose for your new file. If you want to REPLACE the old file with the new file, type in Y (the old file will be erased). If you want to keep the old file or if you are not sure, type N & save your document again under a different name.

Summary

Command mode is accessed by pressing the key and typing C.

The CM (Clear Memory) command is used to delete a document from the screen. It will not delete a document from a diskette.

The SF (Save File) command is used to save a document permanently on a diskette.

Text entered without formatting commands will have a left margin of 0, a right margin of 77, and a page length of 66 lines when printed.

Word wrap is only activated when you print a document. It is not activated during document entry. Word wrap formats the text so that words are not split between lines.

LESSON 3 EDITING AND PRINTING TEXT

In this lesson you will learn:

- How to load a file previously saved on disk.
- How to use the Catalog command.
- How to print a document.
- How to delete lines of text.
- How to automatically repeat commands.
- How to insert lines of text.
- How to set pointers.

After you have worked on a document and saved it on disk, you can verify that it has been saved properly with the Catalog command.

If you have any text on the screen, erase it now by using the CM command (C= C cm).

Exercise 9 Catalog Command

1. Make sure the diskette with the letter file is in the disk drive.
2. Press C= C for command mode.
3. At W>, type: **ca** RETURN . CA stands for catalog. If you wanted to you could also type the word "catalog" instead of its abbreviation. Plus/4 will accept the abbreviated command or the full word.

   Your screen should look like this:

The document we typed in previously is on this diskette and takes 10 blocks of storage. Each block can store 254 characters of data. One diskette will hold 664 blocks. Many documents can be stored on a single diskette. The Catalog command shows you the files stored on a diskette.

Next, we want to bring the document from the disk into memory so we can work on it. This is called loading a file into memory.

Exercise 10 Loading a File

1. Press [C=] [C] for command mode.
2. At W>, type, lf [RETURN] .
3. At LOAD FILE: type: letter [RETURN] .

The disk drive will start spinning and within seconds, your document is displayed on the screen. At this point, you can print the document, add additional text or do any other editing you need to do. First, we will print the document.

Make sure your printer is connected properly and turned on.

Exercise 11 Printing a Document

Printing a document is also done from command mode as follows:

1. Press [C=] [C]
2. Press *p [RETURN] .

Your document should now start to print on your printer. When it is finished, your document should look like the document shown below. To interrupt a document during printing, press the [RUN/STOP] key. Press [RETURN] to continue print. To abort the printing, press [RUN/STOP] and turn off the printer.

June 5, 1984

Dear Uncle Paul and Aunt Pat,

After a beautiful drive through the mountains, we arrived home safely at about 9:00 last night. You were right, the mountains are breathtaking this time of year. The mountain laurel was just starting to bloom and the leaves on the trees were green.

Thank you very much for the wonderful hospitality you extended to Carole and me for the past week. Now that we are back here in the city, we would like to invite you to come spend a few days with us here. There are some great concerts coming up this summer and we know how much you two like music. See, there are some advantages to living in the "civilized" world.

Anyway, thanks again for a wonderful time.

With love,

Tom

P.S. I'll send you the pictures of the trout Paul caught as soon as I get them developed.

Word wrap has automatically formatted the document so that no words are split between lines.

In addition to printing, you can also add and delete text as shown in the next exercises.

Exercise 12 Adding Text

In this exercise, we will insert a few words into our document.

1. Hold the SHIFT key down and press the INST key three or four times. The entire document shifts to the right.
2. Position the cursor over the e in June at L=01 C=04. Press the DEL key until the cursor moves back to L=01 C=01. Deleting moves the entire text just as inserting did.

   If you want to add new text in the manner illustrated above, you would have to press the INST key and type the new text and then use the DEL key to realign your document. Fortunately, Plus/4 has a more efficient method of inserting or deleting text.

3. Move the cursor to L=09 C=01. We want to add the word "bright" before the word "green." If you moved the cursor in front of the word "green" and began pressing the INST key, the rest of the document would also shift. To avoid this shift, Plus/4 uses the SP (Set Pointer) command to limit the amount of text moved during an insertion or deletion.

4. Press C= C

5. At W>, type: **sp** RETURN . A small pointer arrow should appear on the screen. Only text from the current cursor position to the pointer will be shifted during an insertion or deletion.

6. Move the cursor over to the "g" of "green" and hold the SHIFT key down and press the INST key enough times to insert the word "bright." The text below the pointer arrow no longer shifts.

7. Type "**bright**" in the space you just created.

The ability to set pointers on any line for editing is very useful and makes inserting or deleting new text much easier. To erase a pointer, you position the cursor at the line with a pointer and use the EP (Erase Pointer) command. To erase all the pointers in a document, use the CP (Clear Pointer) command.

Inserting text can also be done by line. Let's suppose in our example document, we wanted to add a sentence after the sentence ending ". . . in the civilized world."

Exercise 13 Inserting Lines of Text

In this example, we want to add the sentence: "We could go to a ball game too, Paul."

1. Position the cursor at L=15 C=60 after "world."

2. Type: "**We could also go**" (without the quotes, but include the spaces. The cursor will then move to L=16 C=01. At this point, we want to insert a new line.

3. Press C= C for command mode.

4. At W>, type: **il** RETURN . IL stands for **I**nsert **L**ine. After this command is executed, a blank line will appear in your document.

5. Type: **to a ball game too, Paul** RETURN .

The ability to insert new words and text is one feature of the Plus/4 word processor that can really save time. With a typewriter, you would have to retype the entire letter to insert new text. With the Plus/4 word processor, we use a few simple commands and type the corrections.

Deleting a line of text is just as easy. Suppose we want to delete the P.S. in our letter.

Exercise 14 Deleting Lines/Repeating Commands

1. Position the cursor at L = 25 C = 01.
2. Press C= C for command mode.
3. At W>, type: dl RETURN . DL stands for **D**elete **L**ine. The first line of the P.S. is deleted.
4. Hold down the C= key and press Q. The second line of the P.S. is deleted. C= Q automatically repeats the previous keystroke. It is very useful in reducing keystrokes during repetitive work. Be careful when using C= Q. It will repeat any previous keystrokes. If you execute a command and then press RETURN for some reason, C= Q will repeat the RETURN rather than the command.

You could now use the SF command and save your document because we are done making changes. However, for the purposes of these exercises, you don't need to save the changed document.

Congratulations. Now you know how to enter and edit a document, save it on disk, load it from disk, and print it. These are the basic functions you will need when you use the Plus/4 word processor. The additional features provided by Plus/4 will allow you to customize the document's format and do more complex editing.

Summary

The **CA** (Catalog) command allows you to identify the files and amount of space available on a diskette.

The **LF** (Load File) command allows you to bring a saved document into memory for editing or printing.

The **SP** (Set Pointer) command is used to limit the amount of text movement during the insertions and deletions.

The **EP** (Erase Pointer) command is used to erase a pointer set with the SP command.

The **CP** (Clear Pointer) command erases all the pointers in a document.

The **IL** (Insert Line) command inserts a blank line.

The **DL** (Delete Line) command deletes a line of text.

The ***p** command allows you to print a document.

C= **Q** repeats the previous command.

LESSON 4
CUSTOMIZING MARGINS/ ADVANCED EDITING

In this lesson you will learn:

- How to modify the left and right margins.
- How to set and use tabs.
- Quick cursor movement.

Plus/4 allows you to enter and print a document without having to bother with formatting instructions. Without formatting instructions, the word processor is essentially, "What you see is what you get", with the exception of word wrap. By adding a few simple instructions in your text, you can modify the margins of your document to suit your needs.

In the following explanations, we will use the letter typed in the previous lessons.

Exercise 15 Changing Margins

1. Make sure the letter document is displayed on the screen and that the cursor is at L=01 C=01. (If necessary, load the letter document from your diskette. Press C= C and use the lf command to load a saved document into memory.)
2. Press C= C.
3. At W>, type: il RETURN . We need to open a line at the beginning of the document so we can add the formatting commands to set the margins.
4. Hold the CONTROL key down and press the 9. This will put the words you type in reverse video mode. To distinguish formatting instructions from text, all document formatting instructions are typed in reverse video.
5. Type: lmarg10;:rmarg75; RETURN . These two instructions tell the word processor that when the document is printed it should have a left margin of 10 and a right margin of 75. The semicolons and the colon are used by the program to determine where one instruction ends and another begins. In order for the margin instructions to work properly, the ; and the : must be in the

right places. At this point, your screen should look like this:

6. To deactivate the reverse video so you can continue typing normally, press the **CONTROL** key and type 0.

You have now entered the instructions to tell Plus/4 to print the document with your margins rather than the standard margins. Try printing the document. (**C=** **C** *p) It should look like the sample printout shown below:

June 5, 1984

Dear Uncle Paul and Aunt Pat,

After a beautiful drive through the mountains, we arrived home safely at about 9:00 last night. You were right, the mountains are breathtaking this time of year. The mountain laurel was just starting to bloom and the leaves on the trees were green.

Thank you very much for the wonderful hospitality you extended to Carole and me for the past week. Now that we are back here in the city, we would like to invite you to come spend a few days with us here. There are some great concerts coming up this summer and we know how much you two like music. See, there are some advantages to living in the "civilized" world.

Anyway, thanks again for a wonderful time.

With love,

Tom

P.S. I'll send you the pictures of the trout Paul caught as soon as I get them developed.

If you recall, there are a variety of ways to move the cursor around within your document. You can use the cursor keys, RETURN, SHIFT RETURN, f2 and f1. In addition to these keys, the HOME key will move the cursor to line 1 and the CLR key (SHIFT CLR/HOME) will move the cursor to the last line of your document. These two keys allow you to move quickly within your document.

Exercise 16 Home and Clr

1. Hold down the SHIFT key and press the CLR/HOME key. The cursor should move to the last line of your document.
2. Press f2. The cursor should move to column 41.
3. Press HOME. The cursor should move to L=01 C=41.
4. Press f1 (or SHIFT RETURN). The cursor should be at L=02 C=01.

With the HOME, CLR, f2 and f1 keys, you can move quickly within your document.

Another way to move to a specific column in your document is by using tabs.

Exercise 17 Setting and Clearing Tabs

1. Position the cursor at L=01 C=01.
2. For this example, we will set tabs at column 5, 10 and 40.
3. Position the cursor at C=05.

4. Hold the **CONTROL** key down and press the **=** key. An asterisk appears on the dotted line above the L and C status line on your screen. The asterisk indicates a tab is set at this position.

5. Position the cursor at C = 10. Hold the **CONTROL** key down and press the **=** key. Another asterisk appears on the tab indicator line of the screen.

6. Position the cursor at C = 40. Hold the **CONTROL** key down and press **=**. This will set a tab at column 40.

   Now that the tabs are set, you need a way to move the cursor to the tab position.

7. Press **SHIFT RETURN** to position the cursor at C = 01.

8. Press **SHIFT =**. The cursor moves to C = 05.

9. Press **SHIFT =** again. The cursor moves to the next tab at C = 10.

10. Press **SHIFT =** again and the cursor moves to C = 40.

11. Press **SHIFT =** again and the cursor moves to C = 77.

SHIFT = is used for tabbing.

The word processor also provides you with two ways to clear tabs. To clear all your tabs, Press **C:** **C** and type: ct **RETURN**. CT is the **C**lear **T**ab command. To clear a single tab, position the cursor at the tab position and type **CONTROL=**.

Tabs are always relative to the margins you set up. For example, if you set the left margin at 10 and set a tab at 5, the tab actually will be at 15 when the document is printed.

Summary

Margins are set by typing on a separate line of your document in reverse video: lmarg#;:rmarg#;. Reverse video is activated by CONTROL 9. It is deactivated by CONTROL 0. Margins are only implemented when a document is printed. The right margin should be larger than the left margin.

The CLR key (SHIFT CLR/HOME) moves the cursor to the end of your document.

The HOME key moves the cursor to the top of your document.

Tabs are set by positioning the cursor at the column where you want the tab and typing CTRL =.

To move the cursor to a tab, press SHIFT =.

Tabs are cleared with the CT (**C**lear **T**ab) command.

Tabs are always relative to the margins.

LESSON 5
MORE DOCUMENT FORMATTING

In this lesson you will learn:

- ☐ How to modify margins within a document.
- ☐ How to center a line of text.
- ☐ How to justify text.
- ☐ How to undo an accidental RETURN.

In most documents, you will only need to set margins once, at the beginning of the document. However, Plus/4 will let you change the margins anywhere in your document. The following exercises illustrate this capability.

Exercise 18 Changing Margins within a Document

1. Type the following text. **R** means activate reverse video (CTRL 9). **O** means turn off reverse video (CTRL 0). ← means press RETURN.

   Rlmarg10;:rmarg75;**O**←

   The margins for this document are set at 10 and 75. However, if I want to indent a paragraph, I could modify the left margin and then type my paragraph like this: ←

   Rlmarg15;**O**←

   This line and the next few lines will be indented five characters. When I am ready to move the margin back to column 10, all I need to do is insert an additional left margin instruction.←

   Rlmarg10;**O**←

   Now the document has the original margins again.←

When you are done typing, your screen should look like this.

If you print the document, it should look like this:

The margins for this document are set at 10 and 75. However, if I want to indent a paragraph, I could modify the left margin and then type my paragraph. Like this.

> This line and the next few lines will be indented five characters. When I am ready to move the margin back to column 10, all I need to do is insert an additional left margin instruction.

Now the document has the original margins again.

The lmarg 15 instruction caused the next lines of text to be indented during printing even though they were typed like the previous lines. The subsequent lmarg 10 command returned the margins to their original state.

Right margins may also be modified at any time.

1. Move the cursor to L=05 C;09. The cursor should be over the ← after the ;.
2. Activate reverse video by typing CONTROL 9 and type: :rmarg60; **RETURN** . (Make sure you type a : before the r.)
3. Move the cursor to L=09 C=09. The cursor should be over the ← after the ;
4. Type: :rmarg75; **RETURN**
5. Deactivate reverse video by typing CONTROL 0.

   Your screen should look like this:

If you print this document, the indented paragraph now has a smaller right margin and the last line has the original margins.

The margins for this document are set at 10 and 75. However, if I want to indent a paragraph, I could modify the left margin and then type my paragraph. Like this.

> This line and the next few lines will be indented five characters. When I am ready to move the margin back to column 10, all I need to do is insert an additional left margin instruction.

Now the document has the original margins again.

Note that once you invoke the margin editor by changing the default settings of lmarg0; :rmarg77; even if you reset the margins back to the default settings, the margin editor is still partially in effect. This means that words that fall exactly on the right-margin boundary will be spaced somewhat differently from that point on. This only affects the copying of a section of the spreadsheet to the word processor after the margins have been changed from the default settings.

The ability to modify the margins at any time can give your documents a professional look. In addition to changing margins, you can also center lines for titles or headings.

Exercise 19 Centering

1. Position the cursor at L=02 C=01.
2. Press [C=] [C] and type: il [RETURN] . We will first insert a line for the centering instruction.
3. Hold the [C=] key down and press Q. This repeats the insert line command. We now have two blank lines at the top of the document.
4. Activate reverse video by typing CONTROL 9.
5. Type: center; Do not press [RETURN] .
6. With the cursor positioned after the ;, deactivate reverse video by typing CONTROL 0. Now type: Changing Margins [RETURN] .
7. Press [RETURN] again. Your screen should look like this:

If you print the document, it should look like this:

Changing Margins

The margins for this document are set at 10 and 75. However, if I want to indent a paragraph, I could modify the left margin and then type my paragraph. Like this.

> This line and the next few lines will be indented five characters. When I am ready to move the margin back to column 10, all I need to do is insert an additional left margin instruction.

Now the document has the original margins again.

The Center instruction is the only instruction used so far that appears on the same line as the text. The Center instruction will center any text typed on the same line as the instruction.

In addition to changing margins and centering, you can also right justify the text, which improves the visual appearance of your documents.

Exercise 20 Justify

1. Position the cursor at L = 01 C = 18. The cursor should be positioned over the ← after the ;.
2. Activate reverse video (CONTROL 9).
3. Type: **:justify** **RETURN** .
4. Deactivate reverse video (CONTROL 0).

If you print the document, it should look like this:

Changing Margins

The margins for this document are set at 10 and 75. However, if I want to indent a paragraph, I could modify the left margin and then type my paragraph. Like this.

This line and the next few lines will be indented five characters. When I am ready to move the margin back to column 10, all I need to do is insert an additional left margin instruction.

Now the document has the original margins again.

The right margins are square and aligned. Like the margin and center instructions, the justify instruction is only activated when the document is printed. Document formatting instructions in Plus/4 are implemented only when a document is printed.

To conclude this lesson, you will learn an additional command that lets you undo accidental text deletions. Now that you have worked with the Plus/4 word processor for a while, you have probably experienced the frustration of accidentally pressing **RETURN** at the wrong place and deleting a line. If this happens, reposition the cursor at the point where you pressed **RETURN**, hold down **C=** and press @. The deleted text will reappear.

Summary

The lmarg and rmarg instructions may be used anywhere in a document to change margins.

The center instruction will center a line of text.

The justify instruction will produce right justified text when the text is printed.

C= @ will restore text accidentally deleted by an inadvertent RETURN.

LESSON 6 SEARCH AND REPLACE

In this lesson you will learn:

- How to use the search command.
- How to use the replace command.

The formatting capabilities of the Plus/4 word processor can be duplicated by a typewriter. A typewriter allows you to change margins and set tabs. You could even justify text, although it might take hours of retyping. The next features of Plus/4 that you will learn about have no counterpart on a typewriter.

You know that a document entered with the Plus/4 word processor is stored in the computer's memory. You can easily move the cursor around within a document and make corrections. In addition, Plus/4 provides a way to move around your document based on the contents of the document. With Plus/4, you can search for an occurrence of a specific group of characters or words. You can also search for a word and automatically replace it with another word.

Suppose you are typing a report and you consistently misspell the word "Pennsylvania." Using the Replace command, Plus/4 will automatically locate each occurrence of the misspelled word and correct it.

The Search command performs a similar function but allows you to change the word any way you want.

The ability to replace words automatically allows you to set up standard documents, save them on disk, and reuse them. Invoices, appointment reminders, product announcements, press releases—virtually any standard document could use the search and replace feature to save retyping.

Exercise 21 Search and Replace

For this exercise, we will use the letter typed previously.

1. Load the letter file into memory.
2. Position the cursor at L=01 C=01.
3. First, we are going to search for all occurrences of the word "Paul" in the document.
4. Press C= C for command mode.

5. At W>, type: **sr** **RETURN** . SR is the **S**earch command. This command will find a specific word or phrase in your text and position the cursor at the word or phrase.

6. At SEARCH:, type: **Paul** **RETURN** .
   Plus/4 now finds the first occurrence of the word "Paul" and highlights it as shown below:

7. At CONTINUE Y/N?, if you type Y, Plus/4 will find the next occurrence of the word "Paul." If you type N, the search will stop and the cursor will be positioned at Paul and you can edit the document as usual.

8. Press **Y** and continue the search. In this letter, there are three occurrences of "Paul." After the final occurrence is found, the dotted tab indicator line reappears at the bottom of the screen.

A search using the SR command always starts at the current cursor position and continues until you reach the end of the document. For example, if you position the cursor at the end of your document and try to search for "Paul," no occurrences are found. The cursor was positioned after all the occurrences of the word "Paul" in the text. This aspect of the search command allows you to limit the amount of text that Plus/4 needs to search. For example, if you position the cursor in the middle of a document, the first half of the document will be skipped during the search.

The Replace command will search for a word or phrase and replace it with a word or phrase of your choice. In the next example, we will search for "Paul" and replace it with "Pete."

1. Position the cursor at L = 01 C = 01.

2. Press **C=** **C**.

3. At W>, type: **re** **RETURN** . RE is the Search and **Re**place command.

4. AT SEARCH;, type: Paul RETURN .

5. At BECOMES: type: Pete RETURN .

Summary

SR is the **Sear**ch command. It will find occurrences of a word or phrase.

RE is the Search and **Re**place command. It will find occurrences of a word or phrase and replace them with another word or phrase.

LESSON 7
CREATING, INSERTING, DELETING A BLOCK

In this lesson you will learn to:

- Move blocks of text from one part of a document to another.
- Delete blocks of text.

Good writing requires rewriting and revisions. Rarely is a writer satisfied with a first draft. Words must be deleted or added. Paragraphs must be expanded or compressed. New paragraphs must be inserted.

With a typewriter, rewriting means retyping. With the Plus/4 word processor, rewriting is quicker and easier than with a typewriter and requires minimal retyping. The result: a writer can translate his thoughts into words faster and more efficiently.

The Block Insert and Delete commands allow you to move sentences or paragraphs from one place in your document to another. These commands allow you to rearrange your document at the touch of a few keys. You can even move the block to a different document.

Exercise 22 Inserting and Deleting Blocks of Text

In this exercise, we will once again use the letter typed previously.

1. Load the letter file into memory.

   We are going to create a new paragraph at the end of the document and then insert this paragraph between the first and second paragraphs of our letter.

2. Position the cursor at the end of the document at line 28.
3. Type the following. ← means press RETURN :

   When you moved to the woods after living in the city for so many years, I wondered why you did it. After spending a few days at your mountain retreat, I can understand why you moved.←

4. To insert this new block of text into the right place, we must first tell Plus/4 that this text is going to be a block. Blocks are created using the SP (Set Pointer) and CB (**C**reate **B**lock) commands.
5. First, we have to set a pointer at the end of the block of text, so move the cursor to line 30.
6. Set a pointer here by typing C= C sp RETURN .
7. Move the cursor to the beginning of your text at line 28. This is the start of the block.

8. Press C= C

9. At W>, type: **cb** RETURN . CB is the **C**reate **B**lock command. This command identifies the text from the current cursor position to the next pointer as a block of text. Up to 16 lines may be used for a block.

10. After the block has been identified, we want to insert the block between the first and second paragraphs.

11. Move the cursor to line 10.

12. Press C= C

13. At W>, type: **ib** RETURN . IB is the **I**nsert **B**lock command. This command will take a block of text created with the CB command and insert it above the current cursor line. The IB command does not affect the original text of the block.

14. To delete the original block of text at the end of our document, move the cursor to line 32.

15. Press C= C

16. At W>, type: **db** RETURN . DB is the **D**elete **B**lock command. This command will delete all the text from the current cursor position to the next pointer.

The block of text just deleted could still be inserted into other places in your document. Try using the IB command at the bottom of your text and you will see the deleted paragraph reappear. The reason for this is, when you create a block using the CB command, the text for the block is copied into a special area of memory called a buffer. When the block is inserted, it is actually copied from the buffer into the proper place in your document. Even when the text used to create the block is deleted from your document, a copy of the text is still in the buffer and can be used again until a new block is created. This means you can move blocks to new documents.

Because you can place a pointer anywhere in a document, you have the ability to totally rearrange your entire text. The Create Block, Insert Block, and Delete Block commands open up a wide range of possibilities for the writer who wants to improve the quality of his writing.

Summary

To move blocks of text, a block must first be created using the SP (Set Pointer) and CB (Create Block) commands.

Once a block has been created, it can be inserted into the text using the IB (Insert Block) command.

A block of text can be deleted by the DB (Delete Block) command.

A created block is stored in an area of memory called a buffer. Even if the actual text used for the block is deleted, a copy of the text is stored in the buffer and can be reused until a new block is created.

LESSON 8
MERGE, PRINT, LINKFILE

In this lesson you will learn how to:

- Merge two documents.
- Print a document with an automatic save.
- Link multiple files together for printing.

Certain types of work, like contract preparation or sales proposals, use the same paragraphs over and over again. Plus/4 provides the Merge command to take existing saved documents and merge them with a document in memory.

Exercise 23 Merge Documents

1. Delete any existing text currently on the screen using the CM command (C= C cm).
2. Type the following:
   This is the beginning of a document merged with another document.
3. Position the cursor at L=03 C=01.
4. Press C= C.
5. At W>, type: **mf** RETURN . MF is the **M**erge **F**ile command.
6. At LOAD FILE:, type: **letter** RETURN . The "letter" file will then be loaded into memory and appended to the text we just typed.

The Merge File command is useful if you have standard paragraphs that you use repeatedly. Instead of retyping the standard paragraphs, you can merge them. Merge always appends the merged file at the end of the document in memory.

As you become more familiar with Plus/4 and begin to enter large documents that are longer than 99 lines, you will find the need to be able to link these documents together for printing so you don't have to load a file and print it and then load another file and print it, and so on. The Linkfile instruction is provided to automatically load and print related documents without operator intervention beyond the initial Print command. The Linkfile instruction is similar to the margin instructions. It is typed in reverse video and embedded in the text. The Linkfile instruction must be on the last line of a document. To use Linkfile, a new print command (PR) must be used.

Exercise 24 Linkfile

1. Clear memory (C= C cm) and enter the following text. ← means press RETURN. **R** means activate reverse video (CTRL 9). **O** means deactivate reverse video (CTRL 0):
   This is a small document.←
   R linkfile "letter" **O**←

2. Press C= C.
3. At W>, type: pr RETURN . PR is another print command. This print command will first save your text on disk before printing. The text will automatically be saved under the name ". . tw" (temporary workspace). The PR command prevents you from accidentally deleting your document.
4. After the document is saved, Plus/4 will prompt LOAD FILE:. Here, you can enter any file name. This means you could be working on the fifth document in a link, and begin printing with the first document in the link. After printing, the document originally in memory will be reloaded. In the example, however, we will simply reload ". . tw."
5. At this point, the first document will print. After it is printed, the letter will be loaded into memory automatically and also print. After printing, the first document is loaded back into memory.

There is no limit to the number of documents that can be linked together, except the amount of room you have on your disk. Also, any formatting instructions in the first document will carry over to the subsequent documents in the link. For example, try adding margins of 10 and 75 to the document currently in memory.

It is possible to link documents over multiple disks by inserting a pause instruction just prior to the linkfile instruction. When the pause occurs, you could switch diskettes and continue printing.

Summary

The **MF** (Merge File) command allows you to combine documents.

The **PR** (Print with Save) command prints the document in memory after first saving the document on disk under the file name ". . tw." PR prevents you from accidentally deleting your document.

Linkfile is a formatting instruction that will automatically load the linked document during printing. Margin information in the first document will carry over into the subsequent documents in the chain.

LESSON 9
MISCELLANEOUS WORD PROCESSING FEATURES

In this lesson you will learn:

- How to delete a file.
- How to force a new page.
- How to number pages.
- How to set page length and paper size.
- How to pause print.
- How to embed ASCII characters.

This lesson will explain the remaining word processor functions in a summary format. The commands explained in this lesson are not used as often as the other commands.

Delete a File

Files can be deleted from a diskette using the DF command. To use this command, press C= C and type **df**. At DELETE FILE:, type the name of the file you wish to delete. Once a file is deleted from disk, it cannot be recovered.

Forcing a New Page

The default page length for a Plus/4 document is 60 lines. Normally, once 60 lines of text are printed, the printer will advance to the next page. In certain instances, however, you may need to start some text at the top of a new page. By adding the Nextpage instruction in reverse video anywhere in your document, you can force a new page at that point. For example, the following document will be printed on two pages:

This is on page 1.

nextpage

This line will start on a new page.

Page Numbers

Plus/4 provides the ability to number pages of a document with the #page instruction. Usually, this instruction is added at the beginning of a document in reverse video.

When the #page instruction is in your document, the page number will be printed at the bottom of every page starting with page 1. Pagination will carry through linked documents as well.

If you want to start the pagination with a page number other than page one, you can use the set#pg instruction. This instruction is typed in reverse video anywhere in your text.

The next page number that is printed will use the page number set by the set#pg instruction. Subsequent page numbers will start with this number. This instruction is useful if you want to print out selected pages in the middle of a multiple page document.

Setting Page Length and Paper Size

The default page length of a Plus/4 document is 60 lines. The default paper size is 66 lines. Either or both of these defaults may be modified.

The papersize instruction is used to change the paper size. Normal 11 inch computer paper is 66 lines. There are 6 lines to an inch.

The pagelen instruction is used to modify the number of lines printed per page. By decreasing the page length, you can add a larger margin to the bottom of your page. For example, a page size of 66 and a page length of 55 will leave a larger margin at the bottom of each page in your text. The page length must always be smaller than the page size.

Both the pagesize and pagelen commands should be used in the beginning of your document and typed in lower case reverse video as follows:

pagelen55;:papersize60;

Pause Print

Plus/4 can be used with different printers. If you are using a letter quality printer with changeable print wheels (for formulas or foreign languages), the pause instruction will stop printing so you can change the print wheel. Once you have changed the print wheel, pressing **RETURN** will continue the printing. The pause instruction is entered in reverse video, lower case and embedded in your text where you want the pause as shown below:

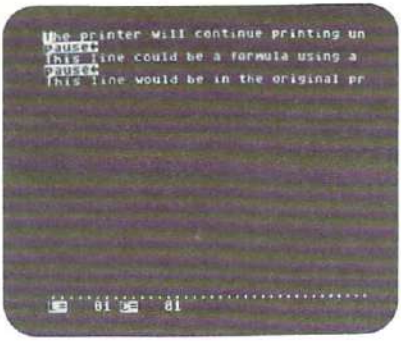
The printer will continue printing until it reaches a pause.

pause

This line could be a formula using a different print wheel.

pause

This line would be in the original print style.



If you are using a single sheet feed printer, the pagepause instruction typed in lower-case reverse video and inserted in the beginning of your document, will cause printing to pause at the end of every page so you can insert a new sheet of paper. Pressing RETURN will continue printing.

pagepause;:lmarg10;:rmarg75;

This document will stop printing at the end of every page.

Embedding ASCII Characters

The asc instruction allows you to insert ASCII characters in your text. The ability to insert ASCII characters in your text allows you to take advantage of different printer features such as enhanced printing, underlining, boldface, etc.

For example, to cause enhanced printing on the MPS 801 printer, you send an ASCII 14, your text, and an ASCII 15 to turn off the enhanced print. In the following example, the text between the two asc commands will be printed in enhanced characters: **asc14;** This will be enhanced **asc15;**

Check your printer manual for additional features you can use. Multiple ASCII characters can be printed with one ASC command. For example, asc27,65;32.

WORD PROCESSOR SUMMARY

You have now learned how to use most of the major commands of the Plus/4 word processor. The following list summarizes the commands and instructions you have learned in alphabetical order.

Cursor Movement/ Special Keys

The cursor arrow keys move the cursor in the direction indicated.

CLR (SHIFT CLR/HOME)
moves the cursor to the bottom of your text.

CTRL =
sets a tab.

CTRL 9
sets reverse video for formatting instructions.

CTRL 0
deactivates reverse video.

DEL
deletes character to the left of the cursor.

f1
moves cursor to the left margin.

f2
moves cursor to the right at column 41.

HOME
moves cursor to the top line of your text.

INSERT (SHIFT INST/DEL)
inserts space to the right of the cursor.

RETURN
terminates a line.

SHIFT RETURN
moves cursor to the left margin.

SHIFT =
tab key.

C= C
activates command mode.

C= @

undo an accidental RETURN.

C= Q

repeat previous command.

Word Processor Commands

All commands are initiated by pressing C= C and are typed in lower case.

CA—Catalog

lists the contents of a diskette and shows how much space is available on the disk in blocks. 1 block equals 254 characters.

CB—Create a Block

used to identify a block of text that will be inserted somewhere else in your document with the IB command. The SP command is used to identify the end of the block. The beginning of the block is the current cursor position.

CM—Clear Memory

used to erase or delete a document currently in memory.

CP—Clear Pointers

deletes all pointers created by the SP command.

CT—Clear Tabs

DB—Delete Block

deletes text from the current cursor position down to the next pointer. Pointers are set with the SP command.

DF—Delete File

deletes a disk file permanently.

DL—Delete a Line of Text.

EP—Erase Pointer

removes a pointer set with the SP command.

IB—Insert a Block

inserts a block of text created with the CB command at the current cursor position. A block can be up to 17 lines long.

ID—Initialize Disk

used when loading a file from one diskette and saving the file on a new diskette. ID should be done just before the save.

IL—Insert a Line of Text.

LF—Load a File

loads a file from disk into memory. Once loaded, the file can be edited or printed.

MF—Merge File

takes a document file saved on disk and appends it to the document currently in memory.

PR—Print Document

saves the document currently in memory on disk with the name ". . tw" then allows you to load any document and print it. This command must be used with linked files.

RE—Search and Replace words or phrases

SF—Save File

saves document currently in memory onto a diskette.

SP—Set Pointer

sets a pointer at the current line. Pointers are used to create blocks, delete blocks and to keep the entire document from shifting during insertions and deletions.

SR—Search for a Word or Phrase.

***P**—Print Document in Memory.

Document Formatting Instructions

These instructions are only executed when a document is printed. They are embedded in the text in reverse video and are typed in lower case. The : is used to separate multiple instructions on the same line. The ; terminates the instruction.

Asc

will send an ASCII character to the printer. ASCII characters are used for enhanced or bold text.

Center

will center text on the same line as the command.

Justify

causes text to be right justified.

Linkfile

used to link documents at print time. The linked document will be loaded and printed automatically without operator intervention. Example: linkfile letter.

Lmarg

sets the left margin. Example: lmarg10;

Nextpage

forces a new page.

NoJustify

returns printing to normal ragged right margins.

No#page

deactivates the #Page command.

Nowrap

turns off word wrap.

Other

used with non-Commodore printers to reverse the character set to standard ASCII.

Pagelen

modifies the number of lines printed on a page. The default is 60 lines. Example: pagelen55;

Pagepause

causes printing to stop at the end of every page.

Papersize

modifies the size of the paper used. The default is 66 lines (11 inches). Example: papersize50;

Pause

causes printing to stop until you press RETURN.

Rmarg

sets the right margin. Example: rmarg75;

Set#pg

sets the page number. This is used in conjunction with the #Page instruction.

#Page

causes the page number to be printed at the bottom of the page.

Wrapon

turns on word wrap.

Formatting Defaults

The following formatting defaults are in effect if no formatting instructions are used in your document:

Left Margin—0
Right Margin—77
Page length—60 lines
Papersize—66 lines
Justify Off
Wrapon

Document Size

99 lines of 77 characters per line

22 lines of 37 characters are visible on the screen at any time.

SPREADSHEET

The term "Spreadsheet" is sometimes not very descriptive of what people actually use such a program for. The name comes from those multi-column, green sheets of paper that accountants sometimes spread several rows and columns of numbers across to perform computations. Since the key word here is Computation, we have made the command to get from our word processor "To our Computational" program: TC.

Once inside the spreadsheet, you will notice it is set up just like a piece of ruled paper with rows and columns identified by the letters "R" and "C." At each row and column juncture there is a "cell" in which can be a number, some label like SALES, or the result of a computation.

The most common uses of spreadsheets are financial statements with the columns being months of the year and the rows being different accounts or financial data. Then with this "model" set up, one can change a sales amount, and all other amounts in the spreadsheet that are functions of sales, like profits, will change accordingly. We have tried to demonstrate not only the standard financial uses of the spreadsheet, but several everyday uses as well. How about a calorie counter that tells you how many calories you burn, based on your weight and what you do?

The spreadsheet or calculator program inside the Plus/4 contains the features found in all spreadsheets, and a few more. But, like the word processor, we have tried to make it simple to learn and use. The tutorial here is very important because it teaches by example. Learning to get all the benefits from a spreadsheet is sometimes only bounded by the imagination. People have used this tool to compute everything from sophisticated financial data to keeping track of points for the local Cub Scout Den.

The benefits of integrated software become very evident when you see how easy it is to take numbers from the spreadsheet and place them into a document in the word processor. This integration ability is best demonstrated by having the monitor screen "split" so the word processor and spreadsheet are both visible at the same time. Now, "map" the numbers from the spreadsheet and watch them literally fly up into the word processing text. Who said you couldn't do two things at once with a small computer?

Again, please take your time in reading the tutorial and practice with small examples before trying to balance the national budget.

INTRODUCTION

This chapter of the manual introduces you to the Plus/4 spreadsheet. If you don't know what a spreadsheet is, a brief overview has been included to help you understand some basic spreadsheet concepts.

The best way to learn about a spreadsheet is to use one. That's why the remainder of this chapter is a self-teaching guide that will instruct you how to use the functions the Plus/4 spreadsheet provides. You will learn how to create your own spreadsheet. In addition, three sample spreadsheet models have been included in Appendix B. These models show some of the capabilities of the Plus/4 spreadsheet and can stimulate your own creativity.

At the end of this chapter is a summary of all the spreadsheet commands. The Reference Section contains additional information.

WHAT IS A SPREADSHEET?

A spreadsheet is a computerized version of an accountant's pad. Instead of using a pencil and a calculator to perform calculations, you use the computer keyboard and the video screen. Like a word processing document, the data entered into a spreadsheet can be saved on disk and reloaded into memory for later use.

The basic component of a spreadsheet is a cell, which is the intersection of a row and a column. The Plus/4 spreadsheet gives you a maximum of 850 cells (17 columns × 50 rows). Each cell can hold numbers, text, or formulas. The numbers in a cell can be added, subtracted, multiplied, or divided. A column or row of cells can be summed and the answer stored in a new cell.

Cells are identified by two numbers: a row number and a column number. For example, 10;5 is the cell in row 10, column 5. The photograph below shows the Plus/4 spreadsheet.

Spreadsheets have many uses, including:

- Budgets
- Checkbook Register
- Loan and Mortgage Payment Calculations
- Calculating the value of an investment
- Stock Price Tracking
- Profit and Loss Statements
- Income Tax Preparation
- Expense Reports

The primary benefits of a spreadsheet are:

- Ease of editing—if you change a number on an accountant's pad, you have to erase your numbers and recalculate totals that depended on the number you changed. With a spreadsheet, you simply change the number and the calculations are all redone automatically.
- Reusable—once a spreadsheet model is set up, it can be reused with new data. Consequently, spreadsheets are good for "what if" type projections, analyses, or budgets that use similar data with minor modifications.
- Accuracy—once all the formulas for a spreadsheet are in place, you no longer have to worry about the accuracy of the calculations. If you change a number and recalculate the answers, you don't have to worry about mistakes. The computer is always accurate.
- Legibility—a spreadsheet can be printed on a computer printer. Unlike handwritten calculations, a spreadsheet printout is always legible.

Anything that could be done on a columnar pad can be done on a spreadsheet. In addition, there are some things that can be done on a spreadsheet that aren't usually done manually because they take too long. Most people find the more they use a spreadsheet, the more uses they find for it.

SELF-TEACHING GUIDE

The Plus/4 spreadsheet uses many of the same commands as the Plus/4 word processor. If you are familiar with the Plus/4 word processor, you should have little trouble understanding the Plus/4 spreadsheet.

The self-teaching guide in this chapter of the manual is similar to the self-teaching guide in the previous chapter on the word processor. Each lesson builds on information learned and examples created in the previous lessons.

As with the word processor chapter, do not try to complete this self-teaching chapter in one sitting unless you are an experienced spreadsheet user. Go slowly and practice each new operation several times. At the end of each lesson is a summary of all the material covered in the lesson. These summaries make convenient stopping points where you can practice. Once you have mastered one aspect of the program, continue to the next lesson.

Not all the commands provided in the Plus/4 spreadsheet are explained in the self-teaching guide. They are explained, however, in the summary at the end of this chapter. Additional detail is also provided in the reference section of the manual.

GETTING STARTED

1. Make sure your computer, disk drive, printer, monitor or television screen are connected properly and turned on.
2. To perform the exercises in this chapter, you will need a formatted diskette. The diskette used in the previous chapter can also be used in this chapter. If you do not have a formatted diskette, see Appendix A or your diskette manual on how to format a disk.
3. Activate the Plus/4 software by pressing the f1 key. After the SYS message is displayed, press RETURN .

   At this point, you are in the word processor. A command is used to move from the word processor to the spreadsheet.
4. Press α C for command mode.
5. At W>, type: tc RETURN . TC stands for **T**o the **C**alculations.

LESSON 1 THE KEYBOARD AND THE SCREEN

In this lesson you will learn:

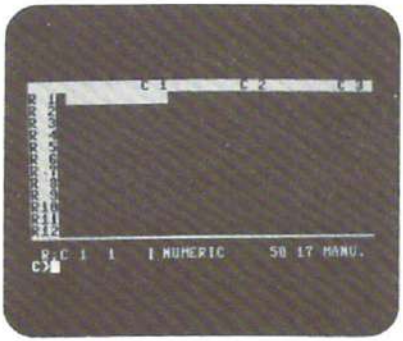
- How the screen is organized.
- How to use the cursor and function keys to move around within a spreadsheet.
- How to enter numbers into a cell.
- How to use the GOTO command.
- How to use the HOME command.

The Plus/4 spreadsheet is divided into 17 columns and 50 rows. Only 3 columns and 12 rows are visible on the screen at one time. The intersection of a row and a column is called a cell. The large cursor block indicates your current cell location. Below the cells is the status line. Below the status line is the command/data entry line. There is a small cursor on the command line that shows you what you are typing.

The status line shows you the current cell position, the data type of the cell, the number of rows and columns in the spreadsheet, and whether you are in manual or automatic calculation mode. Below the status line is the command and data entry line.

Exercise 1 Entering Data; Moving from Cell to Cell

1. At this point your screen should look like this:



The cursor is in cell 1;1.

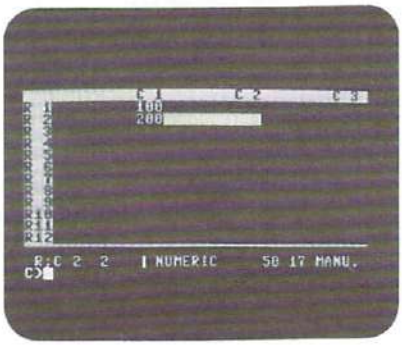
2. Type: **100**. The data you type only appears on the command line.

3. Press RETURN . The data you entered is now placed in row 1, column 1. To enter data into a cell, you must press the RETURN key. (From here on, cells will be identified by two numbers separated by a ;. The first number is the row and the second number is the column. 1;1 is the cell at row 1 column 1.)

4. Press the cursor down key. The cell cursor moves to 2;1 and the status line indicator changes to 2;1.

5. Type: 200 RETURN .

6. Press f2 . The cursor moves to 2;2. Pressing f2 again will move the cursor to 2;3. f2 is used to move from cell to cell to the right.



7. Press f1 twice and the cursor moves back to 2;1. f1 is used to move from cell to cell to the left.

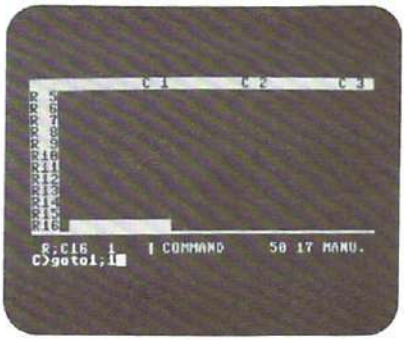
8. Press the cursor right key. Within a cell, the cursor left and right and the Insert and Delete keys work just like they did in the word processor. These keys can be used for editing the data in your cells.

9. Press the cursor down key until you get to Row 16. The data you entered scrolls off the top of the screen. The spreadsheet works like the word processor in this regard because at any given time you only see a portion of your entire work area. The two numbers you entered previously are still in the spreadsheet, but are no longer displayed on the screen.

The spreadsheet also has a command mode like the word processor that allows you to do special things like save files and move quickly to a specific cell.

10. Press C= C. This places you in command mode.

11. At C>, type: goto1;1 RETURN . The Goto command allows you to move the cursor to a specific cell.



12. Press f2 until the cursor is in column 8.
13. Press C= C for command mode.
14. At C>, type: **home** RETURN . The Home command will move the cursor to cell 1;1.

Summary

The spreadsheet has 50 rows and 17 columns.

The intersection of a row and column is called a cell.

The status line indicates the cell cursor position and data type of the current cell.

RETURN causes data to be entered into a cell.

The cursor up and down keys and f2 and f1 are used to move from cell to cell.

Cursor right and left and Insert and Delete can be used to move around within a cell just like the word processor.

C= C activates command mode.

GOTO is a command that moves the cursor to a specific cell. For example, goto3;4.

HOME is a command that moves the cursor to 1;1.

LESSON 2 ENTERING DATA INTO A SAMPLE SPREADSHEET

In this lesson you will learn how to:

- □ Delete a spreadsheet from memory.
- □ Enter text.
- □ Copy a cell.
- □ Enter numbers.
- □ Enter formulas.
- □ Use the Fit command.
- □ Use the Auto command.
- □ Save a spreadsheet on disk.

This lesson is long and contains a lot of valuable information. Make sure you take the time to understand all the concepts presented.

Now that you are familiar with moving the cursor around, you are ready to set up your first sample spreadsheet application. You will create a simple checkbook register that automatically calculates the checkbook balance. Before we start, however, we must first delete the examples typed in previously.

Exercise 2 Deleting a Spreadsheet in Memory

Deleting a spreadsheet in memory works in the same way that deleting a word processing document works. You use the CM command.

1. Press [C:] [C] for command mode.
2. At C>, type: **cm** [RETURN] . CM is the **C**lear **M**emory command.
3. At ARE YOU SURE Y/N?, if you type y, the data will be deleted. If you type n, the data will remain intact. Type y.

We are now ready to start entering our checkbook register.

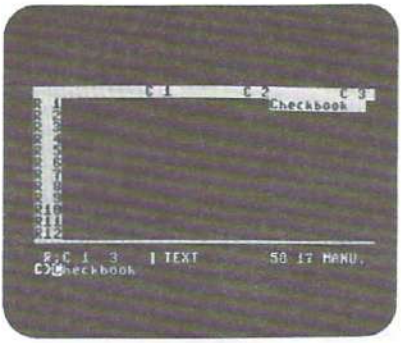
A normal checkbook entry requires date, description, check number, deposit amount, check amount, and balance. Our spreadsheet checkbook will have the same data. The major difference is that the spreadsheet checkbook will automatically calculate the balance.

Exercise 3 Entering Text and Copying Cells

The first step in creating a checkbook register or any spreadsheet is to enter column headings. Entering text is very similiar to entering numbers and requires pressing C= T before typing the text.

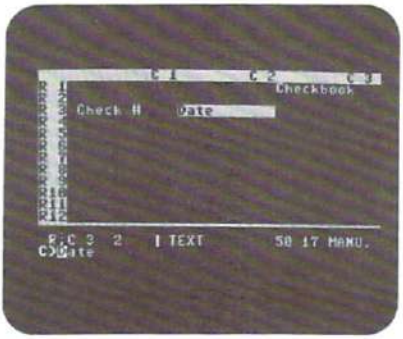
1. Make sure the cursor is at 1;1. Now press f2 twice so that the cursor moves to 1;3.
2. Press C= T. C= T puts you in text entry mode.
3. Type: **Checkbook** RETURN .

The maximum number of characters displayed for a cell is 11. However a text cell can have up to 36 characters. Notice the vertical bar to the left of the word "TEXT" on the status line. This bar shows the cutoff point for characters displayed in a cell. The characters entered for a particular cell take on a greater significance when the spreadsheet is printed. At this point, your screen should look like this:

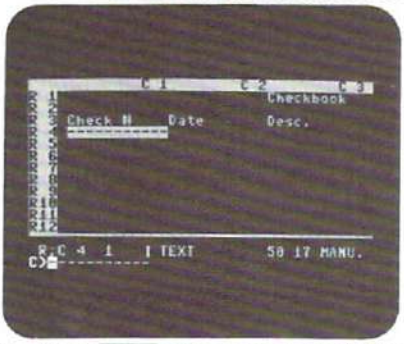


4. Press C= C. C= C puts you in command mode.
5. Type: goto3;1 RETURN . The cursor should move to 3;1.
6. Press C= T for text mode.
7. Type: **Check #** RETURN .
8. Press f2 .

9. Press C= T and type: **Date** RETURN . At this point, your screen should look like this:



10. Press f2 .
11. Press C= T and type: **Desc.** RETURN .
12. Press f2 .
13. Press C= T and type: **Deposit Amt** RETURN .
14. Press f2 . Press C= T and type: **Check Amt** RETURN .
15. Press f2 . Press C= T and type: **Balance** RETURN .
16. Press C= C and type: **goto4;1** RETURN .
17. To make our check register easier to read we will underline the column titles. Press C= T and type: ____ RETURN . The screen should now look like this:

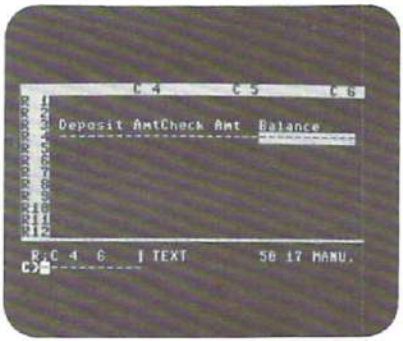


18. Press f2 . The cursor should be in 4;2. We want to extend the underlines so that they are under all the column headings. We could type the underlines in each cell. However, Plus/4 gives you the ability to copy data from one cell into another cell using the Copy command. This command saves you considerable retyping.

19. Press C= C. At C>, type: copy4;1 RETURN. The Copy command will copy all the data from the cell you specify into the current cell.

20. Like the word processor, the spreadsheet also has the C= Q command. This command repeats the previous command and saves some keystrokes. Press f2 to move to 4;3. Now hold down the C= key and press Q. The Copy 4;1 is repeated and the underlines are entered into the cell.

21. Continue pressing f2 and C= Q until you get to 4;6.

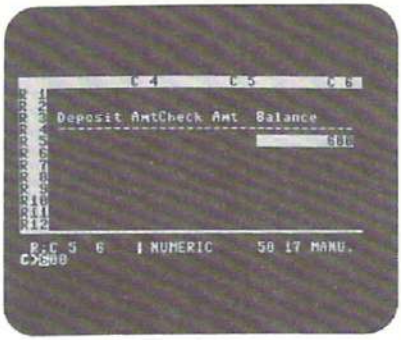


At this point you have entered all the headings for your report. You are now ready to enter the actual data for your checkbook. Entering numbers as you have seen is very similar to entering text. Plus/4 defaults to numeric entry mode for each cell, so you don't have to press a key to activate numeric mode. However if you need to activate numeric entry mode, you can do so by pressing C= N.

Exercise 4 Entering Numbers and Formulas

1. Position the cursor at 5;1.
2. The first entry will be for the opening balance.
3. Press f2 and move to 5;2.
4. Press C= T and type: 1/1 RETURN.
5. Press f2. Press C= T and type: Opening Bal. RETURN.
6. Press f2 and move to 5;6.

7. Type 600 **RETURN**. The screen should look like this:



8. Now you are ready to enter the first check. Move the cursor to 6;1. Use f1 or the Goto command.

9. Press **C=** **T** and type: 100 **RETURN**. Even though the check number is numeric we type it as a text entry so it is left justified in the cell. Text is normally left justified and numbers are right justified.

10. Press **f2**. Press **C=** **T** and type: 1/2 **RETURN**.

11. Press **f2**. Press **C=** **T** and type Mortgage **RETURN**.

12. Press **f2** twice until the cursor is at 6;5.

13. Type: 500 **RETURN**.

14. Press **f2**.

    You are now ready to enter your first formula. As you know, your checkbook balance equals the previous balance, plus deposits, minus checks.

    Balance = Previous Balance + Deposits − Checks

    Looking at our spreadsheet, we see that the previous balance is in 5;6. The deposit amount for the first entry would be in 6;4 and the amount of the check is in 6;5. We want the current balance to go into 6;6 where the cursor is. Translating this information into a formula results in:

5;6	+	6;4	−	6;5	→	6;6
Previous Balance	+	Deposit Amount	−	Check Amount	=	Current Balance

15. Press **C=** **F**. **C=** **F** activates formula mode. Type: **5;6 + 6;4 − 6;5** **RETURN**. Be careful and make sure you type this formula exactly as it is shown here. If you typed everything correctly, 100 should appear in cell 6;6.

So far, so good. But don't quit yet. The next exercise uses the data you just typed in and it hasn't been saved yet. The next step in our checkbook is to enter the formula that will calculate the balance for cell 7;6. If we use our previous example, we see that for cell 7;6:

Previous balance is in 6;6

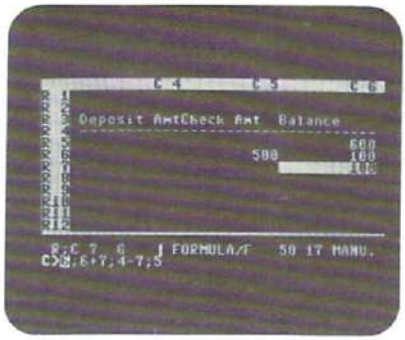
Deposit Amount is in 7;4

Check Amount is in 7;5

The resulting Plus/4 formula that would be entered into cell 7;6 is: 6;6 + 7;4 – 7;5. Notice how similar this formula is to the formula entered for cell 6;6. The only difference is that the row number for each cell in the formula has increased by one. Otherwise the formula is the same. Occurrences like this are common in spreadsheets. Consequently, the Plus/4 spreadsheet has the Fit command to automatically take a formula from one cell and adjust it so that it works properly in another cell.

Exercise 5 Fit

1. Position the cursor at 7;6.
2. Press C= C and type; fit6;6 RETURN . This command means take the formula in 6;6 and modify it so that it applies to the cell we are in.
3. Press C= F and look at the formula that resulted in 7;6.



You will see that the formula is correct according to the calculations made above. The Fit command is very useful.

4. Move to 8;6. Previously, we used C= Q command to repeat the Copy command. We can use the C= Q command here to repeat the Fit command.

5. Press C= Q and cursor down repeatedly until you have a formula in cells 8;6, 9;6, 10;6, and 11;6. If you check the formulas in 8;6, 9;6, 10;6, and 11;6 (press C= F to check the formulas), you will see that the Fit command was repeated for each of these cells.

The Fit command and C= Q are used together quite often in Plus/4 spreadsheets. It is important that you understand how they work.

The Fit Command

The Fit command is useful when you are copying a formula from one cell to another. There are certain rules that the Fit command follows.

If the new cell is in a new column but on the same row as the original cell, all column references in the formula will be adjusted to reflect the new column. The row references will not be changed. For example, let's assume you have the formula: 1;1 + 2;1 + 3;1 in cell 4;1. You then move to cell 4;4 and do a fit4;1 because you want to copy the formula from 4;1 into 4;4. The resulting formula in cell 4;4 will be: 1;4 + 2;4 + 3;4.

	c1	c4	
R1	100	500	
R2	200	600	
R3	300	700	
R4	1;1+2;1+3;1	1;4+2;4+3;4	Fit4;1 results in this formula

If the new cell is in a different row but in the same column as the original cell, then all the row references in the formula will be adjusted to reflect the new row. The column references will not change.

	C1
R1	100
R2	200
R3	300
R4	1;1 + 2;1 + 3;1
R5	2;1 + 3;1 + 4;1←Fit4;1 created this formula

If the new cell is in a different row and a different column, both the row and the column references will be adjusted.

	C1	C4
R1	100	
R2	200	600
R3	300	700
R4	1;1 + 2;1 + 3;1	800
R5		2;4 + 3;4 + 4;4 This formula was produced using Fit4;1.

Exercise 6 More Data Entry / Automatic Calculations / Saving a File

Now that you have entered the formulas for the balance down to 11;6, you can enter the rest of the data for the checkbook. Follow the table below for the remainder of the entries. Ignore the balance column for the time being.

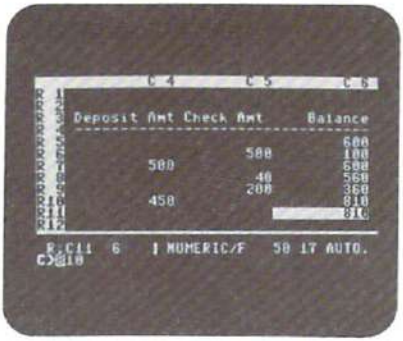
	C1	C2	C3	C4	C5
R7		1/3	Deposit	500	
R8	101	1/10	Electric		40
R9	102	1/15	Insurance		200
R10		1/17	Deposit	450	

Remember to use the C= T key to enter text. The check #, the date, and the description are all text entries. Press RETURN to enter the data for each cell. Use the cursor down key to move down a row. Use f2 to move right a column. Use f1 to move left a column. You can edit an individual cell by using the cursor right and left keys and Insert and Delete if necessary.

If you move to 7;6, you will see that even though we have entered all the numbers for our check register, the balance is unchanged. The reason for this is that we are in manual calculation mode. (Note the "manu." on the status line.) In manual mode, a formula is only calculated when you press RETURN in the cell. Press RETURN . Notice how the number in the cell now reflects a true balance. At this point,

we have the option to cursor to each of the cells with formulas and press **RETURN** to compute the correct answers, or we can put the spreadsheet in automatic calculation mode.

1. Press **C=** **C** for command mode.
2. Type: **auto** **RETURN** . The status line now indicates "auto." and the command line displays "working" as the calculations are made. The result of the automatic calculation mode is that all the formulas are calculated and the correct answers are placed in these cells.



Quite a bit was covered in this lesson. Now let's save the spreadsheet on disk. Fortunately, the Save File command works the same in the spreadsheet as it does in the word processor.

Make sure that you have a formatted diskette in your disk drive. Press **C=** **C** and type: **sf** **RETURN** . At SAVE FILE:, type: **checks** **RETURN** . Plus/4 now saves your spreadsheet to disk.

If you use the Catalog command (it works just as it did in the word processor), you will see a file called "checks.c." Plus/4 appends the ".c" at the end of spreadsheet files so you can distinguish them from word processing files. You don't have to worry about the ".c" when saving or loading files. You simply type the regular file name without the ".c".

Summary

The CM command is used to delete a spreadsheet from memory.

Text is entered into a cell by pressing C= T and then typing the text.

The Copy command will copy any cell into the current cell. For example, copy 2;2 will copy cell 2;2 into the current cell.

C= Q will duplicate the previous command.

The default mode of data entry for any cell is numeric. To force numeric entry, press C= N.

C= F activates formula entry.

The Fit command takes a formula from one cell and adjusts it so it will work in another cell. For example, fit 3;3 will take the formula from cell 3;3 and adjust it so that it will work properly for the current cell.

The Auto command will automatically calculate all the formulas in a spreadsheet. The default mode is Manual calculations. In Manual mode, a formula is only calculated when you enter the cell and press RETURN .

The SF (Save File) command is used to save a spreadsheet on disk.

The CA (Catalog) command displays the contents of the diskette in the drive.

LESSON 3
INTEGRATING THE SPREADSHEET AND THE WORD PROCESSOR

In this lesson you will learn:

- How to load a file previously saved on disk.
- How to create screen windows.
- How to print a spreadsheet using the word processor.

In the last lesson, you should have saved the sample spreadsheet on disk using the file name "checks." This file will be used in the examples in this lesson. Before you can use this file, you must load it from diskette.

Exercise 7

Loading a File

Loading a file in the spreadsheet is identical to loading a file in the word processor.

1. Make sure the spreadsheet is displayed on your screen and that the diskette with the "checks" file is in the disk drive.
2. Press C= C for command mode.
3. At C>, type: lf RETURN . LF is the **L**oad **F**ile command.
4. At LOAD FILE:, type: **checks** RETURN . In a few moments the spreadsheet entered in the previous lesson is displayed on your screen. Once a spreadsheet is loaded into memory, you can edit it, add new cells, or do additional calculations.

You have already seen how you can move from the word processor to the spreadsheet with the TC command. You can also move from the spreadsheet to the word processor using the TW (**T**o the **W**ord processor) command. The ability to move back and forth between functions is an example of the integration in Plus/4.

An additional level of integration is the ability to view a word processing document and a spreadsheet on the screen simultaneously.

So far, you have only been able to see either a word processing document or a spreadsheet on the screen. There was no way to view both simultaneously. The ability to view multiple operations on the screen simultaneously is called windowing. The windowing capabilities of Plus/4 allow you to view a word processing document and a spreadsheet at the same time. Windowing also makes it much easier to pass data from the spreadsheet to the word processor.

Exercise 8 Windowing

1. Make sure the "checks" spreadsheet is loaded and displayed on your screen.
2. Press C= C for command mode.
3. At C>, type: ha RETURN . HA is the **Ha**lf Screen command. It reduces the number of rows displayed for your spreadsheet from 12 to 7. If you move the cursor around your spreadsheet, you will see that the entire spreadsheet is still in memory. Only a smaller portion of the spreadsheet is displayed.
4. Press C= C again and type: tw RETURN . TW is the command to move from the spreadsheet **t**o the **w**ord processor. You will notice that the word processor tab line and the word processor status line are shown at the bottom of the screen. If you type a few characters, you will see that you are in the word processor.

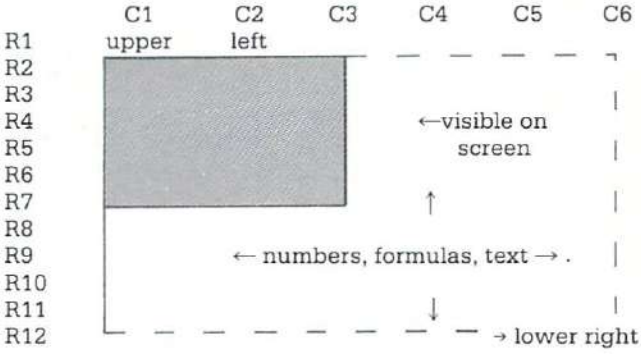
Normally, 22 lines of text are displayed on the word processor screen. In Half Screen mode, only 12 lines are displayed. However, the other 10 lines are used for the spreadsheet so you can view your spreadsheet at the same time you are entering text in the word processor. Being able to view a spreadsheet while typing a document is useful if you are using the spreadsheet to make calculations that will be entered into the word processor or if you want to transfer data from the spreadsheet to the word processor.

The main reason data is transferred from the spreadsheet to the word processor is for printing. To save memory, all printing functions in Plus/4 are done through the word processor. This means we need to have the ability to transfer data from the spreadsheet or file manager to the word processor.

Plus/4 has two commands that are used to transfer data from the spreadsheet to the word processor: Map and Blkmap. Once data is transferred into the word processor, the data can be edited, formatted, or printed like a normal document.

Exercise 9 Passing Data from the Spreadsheet to the Word Processor: Blkmap.

1. Make sure you are in the word processor (use TW to move from the spreadsheet to the word processor) and that both the spreadsheet and the word processor are displayed on your screen. Position the cursor at L=01 C=01.
2. Exit the word processor and move to the spreadsheet by typing: C= TC RETURN .
3. The Blkmap (Block Map) command treats the data in your spreadsheet as a block of text. To transfer the data, you need to have the cursor positioned in the upper left corner of the block. You then specify the lower right corner of the block as shown below:



To use Blkmap, you must first identify the lower rightmost cell of your block. (Note: this example uses the "checks" file. If you have not loaded this file, do so now.) In the example, cell 10;6 is the lower rightmost cell.

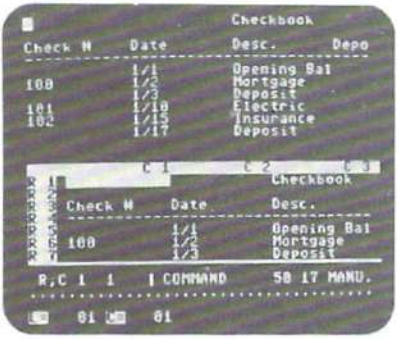
4. Press C= C and type: home RETURN . The Home command moves the cursor to 1;1. In our example, 1;1 is the upper left corner of the block of data to be transferred.

5. Press C= C.

6. Type: blkmap 10;6 RETURN. Cell 10;6 is the lower rightmost cell of the block.

7. Move to the word processor by typing: C= C tw RETURN.

8. Move the cursor to L=01 C=01. The data from the spreadsheet has been transferred or mapped into your word processor.



When using Blkmap, you first have to position the cursor at the point in your word processing document where you want the data transferred. In the example above, we used L=01 C=01. The position could be anywhere in the document. You could have text in your document and transfer the spreadsheet data below the text. Also, Blkmap only transfers 11 characters of data per cell. In other words, whatever you see on the spreadsheet screen will be transferred. The Map command, which will be discussed later, will transfer all 36 characters of a text cell.

Now that your spreadsheet data is in the word processor, you must insert a nowrap instruction before you can print it. Nowrap maintains the integrity of the spreadsheet columns. To add this instruction, insert a line and type nowrap in reverse video on this line. Alternately, you could add carriage returns at the end of each line to cause the spreadsheet to print properly. Once this is done, use C= C *p to print the data. The resulting printout should look like this:

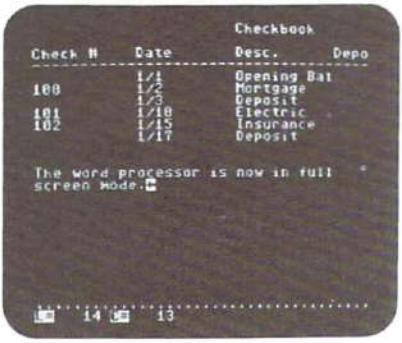
Checkbook

Check #	Date	Desc.	Deposit Amt	Check Amt	Balance
	1/1	Opening Bal			600
100	1/2	Mortgage		500	100
	1/3	Deposit	500		600
101	1/10	Electric		40	560
102	1/15	Insurance		200	360
	1/17	Deposit	450		810

Note that once you invoke the margin editor by changing the default settings of lmarg0; :rmarg77; even if you reset the margins back to the default settings, the margin editor is still partially in effect. This means that words that fall exactly on the right-margin boundary will be spaced somewhat differently from that point on. So when you blkmap a section of the spreadsheet into the word processor, please remember that margins do affect the final print

Your spreadsheet data in the word processor is like any other word processing text. It can be edited, moved, deleted, saved, or printed. Right now, all we needed to do is print the text. It is not necessary to save it at this time.

To see how editing works, let's suppose we want to add some text at the end of the new document. Currently, the screen is in Half Screen mode. It is easy to put the screen back to normal by typing C= C fu RETURN . FU is the Full Screen command. Your screen should look like this:



To add new text, you simply type it in.

Summary

The **LF** (Load File) command is used to load a file from disk into memory.

The **HA** (Half Screen) command puts the screen into window mode so you can view the spreadsheet and the word processor at the same time.

The **TW** (To the Word Processor) command moves from the spreadsheet to the word processor.

The **Blkmap** (Block Map) command allows you to transfer data from the spreadsheet to the word processor. You first position the cursor where you want the data to be transferred in the word processor. Then you move to the spreadsheet, position the cursor in the upper left corner of the block and specify the lower right corner of the block. For example, Blkmap 10;6. Once a spreadsheet has been transferred to the word processor, it functions like a normal word processing document and can be edited, printed, or saved.

LESSON 4
FORMATTING, FORMULAS, EDITING CELLS

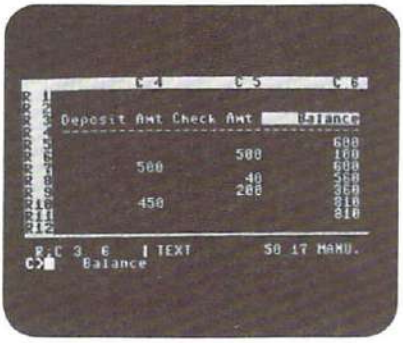
In this lesson you will learn:

- How to change the appearance of a cell.
- How to edit and delete the data in a cell.
- How to save a file.
- More about formulas.

In the previous lesson, we printed our sample spreadsheet. Look at the printout now. The text is always left justified and numbers are always right justified. The word "Balance", for example, is left justified in the column. It would look better if it were moved to the right. The numbers in the columns would look better if they were displayed like dollar values with two decimal places. The Plus/4 spreadsheet provides ways to change the way a cell looks.

Exercise 10 Formatting and Editing

1. Load the "checks" file and move the cursor to 3;6. The word "Balance" is left justified in the cell. "Balance" does not have to be left justified. It is possible to place text anywhere in the 36 characters available for text cells.
2. Hold the **SHIFT** key down and press **INST/DEL** until the "e" in "Balance" is under the vertical bar to the left of the word "TEXT." Press **RETURN**

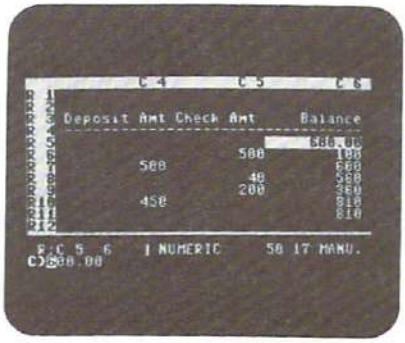


Notice how the word "Balance" appears in cell 3;6. Text within a cell can be edited with insertions and deletions just like a word processing document. To delete data in a cell, you can use the **DEL** key and delete the characters.

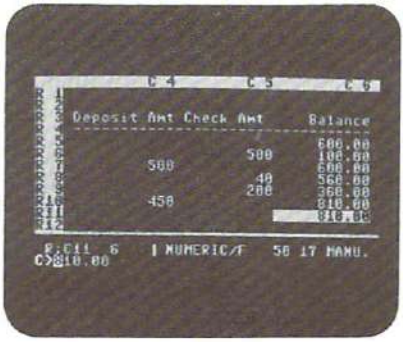
Numbers in a cell can also be modified. Let's suppose we want all the numbers in the balance column to be displayed in a two-decimal, dollar format.

3. Move the cursor to 5;6.

4. Press C= C.
5. At C>, type: $$ RETURN .
6. Press RETURN again. The data in 5;6 is now in $$ format.



Plus/4 provides three ways to format numbers: $$ (dollar), in (integer), and fl (floating point). The normal default is floating point. Once you change the format, it will stay changed until you change it to another format. Any number entered in a specific format will stay in that format unless you go back to the cell, change the format again, and press RETURN in the cell. For example, if you cursor down column 6 and press RETURN in every cell, all the numbers in column 6 will be displayed in the $$ format.



1. Move the cursor to cell 6;5.
2. Put the spreadsheet in auto calculation mode by typing: C= C auto RETURN .
3. Change the format to floating point by typing: C= C fl RETURN .

4. Type; 400 into cell 6;5. The values in the balance are all changed to reflect the $200 difference caused by typing 400. However, they all stay in $$ format even though the format for the rest of the spreadsheet is now floating point. If you now move to 6;6 and press RETURN, the value in 6;6 will be displayed in floating point again. Change the format back to $$.

Now that you have changed the balance column to use the $$ format, let's save the file with this format.

1. Press C= C and type: sf RETURN.
2. At SAVE FILE: type: checks RETURN.
3. Notice that Plus/4 now asks REPLACE Y/N? Like the word processor, a spreadsheet file can be modified and saved again with the same name. Type Y here and save the file.

So far, the only formulas we have used are simple "add this cell to that cell." These formulas are all in a format similar to:

1;1 + 2;1 − 3;1

With this kind of formula, you simply combine cells using the following arithmetic operators:

+ Addition

− Subtraction

* Multiplication

/ Division

↑ Exponentiation

The normal order of calculation in a Plus/4 formula is left to right. Parentheses may be used to modify the order of calculations. But nested parentheses are not permitted. For example: 3;1 + (4;1/5;1) is a valid formula. (3;1 + (5;1/6;1))*4;1 is not valid because of the nested parentheses. Only one level of parentheses may be used. (More advanced spreadsheets like Calc/Plus allow nested parentheses.)

Using numeric constants in formulas is permitted but the constant must have the # as a prefix. For example if you wanted to multiply 1;1 by 100, the format would be: 1;1*#100. The # indicates to Plus/4 that you are using a numeric constant rather than a cell. The Plus/4 spreadsheet allows numeric constants up to 99,999.

Exercise 11 Formulas

In this exercise, we will use the "checks" spreadsheet saved on disk.

1. Make sure the "checks" file is loaded into memory and displayed on the screen.

2. Move the cursor to 12;4. We are going to devise a formula to find the average of all the deposits. The average is the sum of the entries divided by the number of entries. Based on the previous examples of formulas, this formula could be set up as:
   (7;4 + 10;4)/#2
   Since 2 is a numeric constant, it must have the # prefix.

   Another way to express this formula is to use the Sum command as follows:
   (sum5;4 to 10;4)/#2

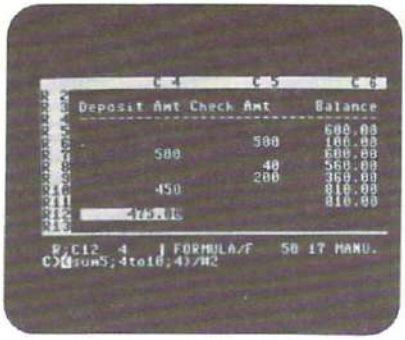
   The Sum command used in this example is the same as:

   5;4 + 6;4 + 7;4 + 8;4 + 9;4 + 10;4
   The Sum command works for rows or columns of data. You must specify the first and last cells of the sequence of cells to be added. Then all the cells between and including the cells specified will be added together. The following example shows how the Sum command works.

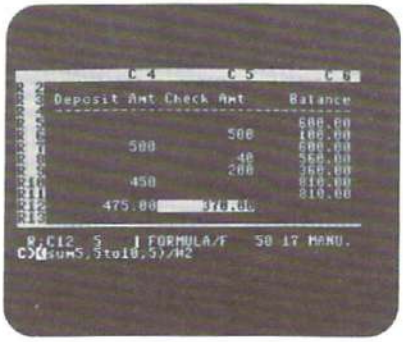
```
      C4    C5    C6    C7
R1
R2
R3
R4
R5   |100| 200   300   400 | Sum 5;4 to 5;7
R6   ------------------------------------------
R7   |200|
R8   |300|
R9   |400|
R10  |500|
R11    --
        ↑

Sum 5;4 to 10;4
```

3. Press C= F and type:
   (sum5;4 to 10;4)/#2 RETURN



4. Move to 12;5. We are also going to find the average of all the checks. The FIT command also works with formulas that use the Sum command.
5. Press C= C and type: fit12;4 RETURN.
6. Press RETURN C= F.



The column numbers in the formula have been adjusted by the Fit command. The column numbers were all row 4: now they are for row 5. However, we still have to edit the formula because in column 5 there are 3 numbers in our average computation instead of 2.

7. Use the cursor right key and move the cursor over the 2. Change it to a 3 and press RETURN.

The resulting answer is in floating point format. To change the format to $$, press C= C and type $$ RETURN, then press RETURN again. The resulting answer will be in $$ format.

Summary

Cells can be edited and characters inserted or deleted like a word processing document.

Numbers can be displayed in $$ (2 decimal place) format, IN (integer), or FL (Floating Point). The default is floating point. Once a number is put in a specific format, it will stay in that format unless it is specifically changed. Plus/4 does not have global format changes.

Numeric constants in formulas must be prefixed by a #. For example: 1;1 + #100 or #10*#50.

Formulas can use +, −, *, /, or ↑.

Formulas are evaluated from left to right. Parentheses can be used to change the normal order of calculation.

The Sum command will sum a row or column of numbers. The first and last cells to be summed must be specified. For example: sum1;1to5;1 will add the numbers in cells 1;1, 2;1, 3;1, 4;1, and 5;1.

LESSON 5
INSERTIONS, DELETIONS AND COPYING

In this lesson you will learn:

- ☐ How to insert rows and columns.
- ☐ How to delete rows and columns.
- ☐ How to copy rows and columns.

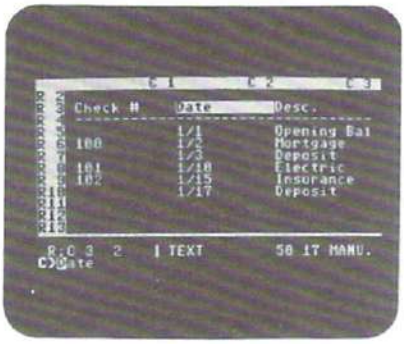
In the last lesson, you saw how data could be inserted or deleted within a cell. The Plus/4 spreadsheet also provides commands to insert or delete rows and columns of cells and to copy rows or columns.

Using the "checks" example again, we will insert a new column that could be used to balance the check register. The new column will be a blank area to check off whether or not a check or deposit has cleared.

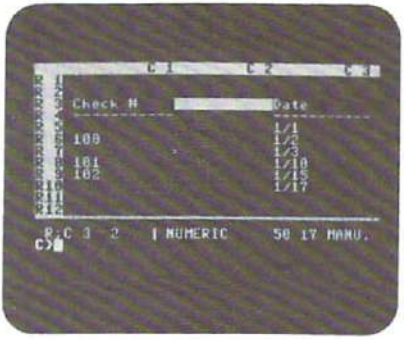
Exercise 12 Inserting a Column

This exercise will use the "checks" file from the previous exercises.

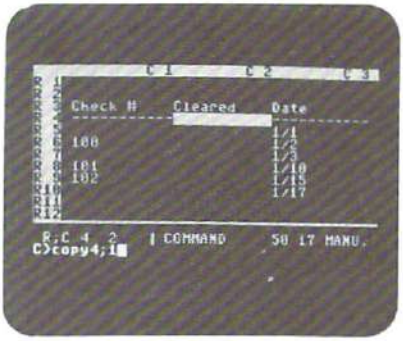
1. Make sure the "checks" file is loaded in memory and displayed on the screen.
2. Position the cursor at 3;2.



3. We want to insert our new column at column 2. Press C= C for command mode.
4. At C>, type: **cins** RETURN . CINS is the **C**olumn **I**nsert command. After you type the command, the command line of the screen will display WORKING. In a few seconds, a new blank column will appear.



5. If you move the cursor to the right, you will see the rest of the spreadsheet is still intact. The next step is to add column headings for the new column.
6. Press [C=] [T] and type: **Cleared** [RETURN] .
7. Move the cursor to 4;2 and copy 4;1 using the COPY command. ([C=] [C] copy4;1).

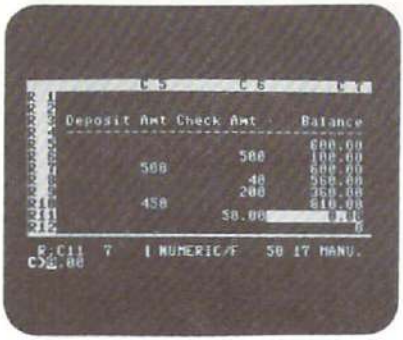


We now have a new column that can be used to indicate whether a deposit or check has cleared yet.

So far, everything looks great, but it isn't. Move the cursor to 11;1. Let's make another entry into our check register now. Here is the entry:

Check #	Date	Desc	Dep	Check
103	1/18	Dentist		50

The resulting balance should be $760. Move to 11;7 and press RETURN. The balance shows 0. What happened?



Press C= F and look at the formula in 11;7. It reads: 10;6 + 11;4 − 11;5. The formula was correct before we inserted the new column and the balance was in column 6. Now that the column has been moved to column 7, the formula is no longer correct.

To correct formulas after column inserts (or row inserts), you have to reenter the formulas in the affected cells. In our example, this is fairly simple. We can reenter the correct formula in cell 6;7, then use FIT and C= Q to copy the formula down the column.

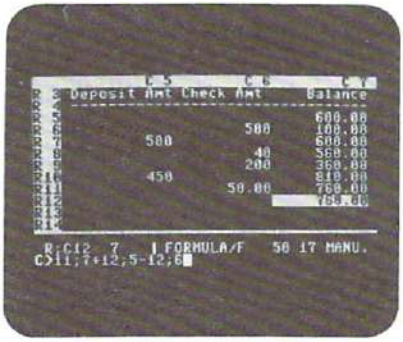
In more advanced spreadsheets, such as Calc/Plus, the formulas are adjusted automatically after a column or row insert. Calc/Plus is more advanced than Plus/4 because the memory for programs is dedicated solely to the spreadsheet. There is no word processing or file management in Calc/Plus.

Exercise 13 Fit

1. Position the cursor at 6;7.
2. Press C= F for formula mode and type: **5;7 + 6;5 − 6;6** **RETURN** . The correct balance will be displayed.

(If you saved your spreadsheet with the $$ format for the balance column, make sure you type C $$ to put the spreadsheet into $$ mode. Otherwise it will be in floating point mode.)

3. Move to 7;7. Press C and type: fit6;7 RETURN .
4. Move the 8;7. Hold the C key down and press Q. The Fit command is repeated and the new formula is copied into this cell.
5. Continue typing C Q until you reach 12;7.



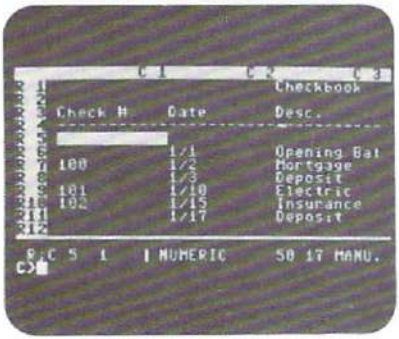
The correct balance should now be displayed in 11;7. If you wanted to add more checks or deposits, the balance calculated for them would also be correct now. (You do not have to save this spreadsheet. In the upcoming exercises, the "checks" file will be used without the new column.)

If you delete a column, using the CDEL command, insert a row using the RINS command, or delete a row using the RDEL command, you would need to readjust your formulas again. Try deleting the new column 2 you just created and see what happens to the formulas. To delete the column, position the cursor at 2;3. Press C and type cdel RETURN .

Exercise 14 Inserting and Deleting Rows

In this exercise, we will again use the original "checks" file.

1. Load the "checks" file. Notice that if you had data in your spreadsheet, loading the old "checks" file erased what was previously on the screen.
2. First we are going to insert a row beneath the row of underlines in row 4. Move the cursor to 5;1.
3. Press C= C and type: rins RETURN. RINS is the **R**ow **I**nsert command.



4. If you now move to 7;6 and press RETURN, the balance will change to 0. As with column inserts, row inserts do not adjust formulas. You have to reenter the formulas and use FIT and C= Q when possible. DO NOT READJUST THE FORMULAS IN THIS EXAMPLE, BECAUSE WE ARE GOING TO DELETE THE NEWLY INSERTED ROW.
5. Position the cursor at 5;6.
6. Press C= C and type: rde l RETURN. RDEL is the **R**ow **D**elete command.
7. Move the cursor to 6;6 and press RETURN. The balance should be correct again.

You have already seen how Plus/4 can copy single cells using the Fit or Copy commands. Plus/4 also provides commands to copy rows or columns: RCO (Row Copy) and CCO (Column Copy). These commands are similar to the Copy command. That is, they simply copy the data in the cells. They do not adjust the formulas.

Exercise 15 Row Copy

1. Position the cursor at 13;1. We are going to copy the underlines from row 4 into row 13.
2. Press [C=] [C] and type: rco4; [RETURN].
3. The word "WORKING" will be displayed on the screen and in a few moments, the underlines will be copied.

The Column Copy command uses a format similar to Row Copy. With both commands, you must enter the ; as the final character in the command and you must have the cursor positioned in the row or column where the data is to be copied.

Summary

The following commands are used to insert or delete rows or columns:

CINS—Column Insert

CDEL—Column Delete

RINS—Row Insert

RDEL—Row Delete

After any of these commands are used, formulas should be checked to make sure that they are still correct. If the formulas are no longer correct, reenter them or use the Fit command.

CCO (Column Copy) is used to copy a column of data into another column. For example, CCO5; will copy column 5 to the current column.

RCO (Row Copy) is used to copy a row of data into another row. For example, RCO 6; will copy row 6 into the current row.

With both of the copy commands, any data in the current row or column will be overwritten by the copied data.

LESSON 6 ADVANCED CALCULATIONS/ CHANGING SCREEN COLORS

In this lesson you will learn:

- How to change the screen color.
- How to create a spreadsheet to calculate monthly mortgage payments.
- How to enter a complex formula.

So far, the only colors you have seen with the Plus/4 software are black and yellow. These colors were chosen because they are easy on the eye and they allow Plus/4 to be used with a black and white TV set. The Plus/4 software takes advantage of the color capabilities of the Commodore Plus/4 with the Color command.

Exercise 16 Changing Colors

1. Make sure you are in the spreadsheet.
2. Press C= C.
3. At C>, type: color1; RETURN . The result is black text on a gray background.

With the Color command, you can enter any number between 0 and 15 and the background color will change to the corresponding color listed in the table below. The character color automatically changes to a color that contrasts suitably with the background color:

Number	Background Color
0	Black
1	Gray
2	Red
3	Cyan
4	Purple
5	Green
6	Blue
7	Yellow
8	Orange
9	Brown
10	Yellow Green
11	Light Red
12	Blue Green
13	Light Blue
14	Dark Blue
15	Light Green

Normally the screen is in Color 0, black. Once you have changed the color in the spreadsheet, it will stay changed in the word processor or the file manager.

At this point, you have learned enough commands to use the Plus/4 spreadsheet for:

- □ Check Register
- □ Budgeting
- □ Profit and Loss Statements
- □ Income Tax Preparation
- □ Expense Accounting

or any type of calculation that requires primarily adding rows or columns with some multiplication, subtraction, or division as well. Appendix B contains some sample models that will help you get started in creating your own spreadsheets.

The example that follows will show you how to use your Plus/4 spreadsheet as an advanced calculator. This example assumes that you know how to interpret an equation.

The next example will show you how to use your Plus/4 spreadsheet to calculate a monthly mortgage payment.

To use Plus/4 to calculate mortgage payments, we must first know the formula an accountant would use to calculate these payments. Here is the formula we will use:

$$\text{Monthly Payment} = \frac{\text{Prin}*(\text{Int}/(\text{No}*100))}{1-(1/((1+(\text{Int}/(\text{No}*100)))\uparrow((\text{Yr}*\text{No})-1))}$$

Where

Prin = Principal

Int = Interest rate

No = Payments per year

Yr = Number of years

Ideally, we should be able to take this entire formula and enter it as one line in Plus/4. However, Plus/4 can only interpret formulas with one level of nested parentheses. To use Plus/4 to calculate a mortgage payment, we have to break down the formula into pieces that Plus/4 can handle.

The Plus/4 spreadsheet does calculations in a slightly different way then your Plus/4 does in BASIC. With the spreadsheet, expressions are evaluated from left to right, unless parentheses are used to change the order of calculation. The following exercise provides some examples of how the spreadsheet evaluates formulas.

Exercise 17 Evaluating Formulas

1. Make sure that a blank spreadsheet is displayed on your screen.
2. Move the cursor to 1;1.
3. Press C= F and type the following:
   #2+#1*#4 RETURN

The answer given is 12. The addition is done before the multiplication. In BASIC, 2+1*4 results in 6. The multiplication is done before the addition. It is important to realize that there are differences in the way the spreadsheet does calculations as compared to BASIC. BASIC has priorities (e.g., multiplication is done before addition). In the spreadsheet, calculations are strictly left to right.

Try practicing some of your own calculations so you can understand how the formulas work.

Now that you understand how formulas are evaluated, we can begin to figure out how to translate the mortgage formula into something usable by Plus/4.

First, we will set up the text portions of the spreadsheet.

Exercise 18 Text Labels

1. Delete any existing data from your spreadsheet using the CM command.
2. Position the cursor at 1;1.

3. Type in your text labels so the screen looks like this:

```
   C1     |     C2     |     C3
R1                 Periodic Payments
R2
R3  Int. Rate
R4  Principal
R5  Payments/Yr.
R6  Years
R7
R8  Periodic Payment =
```

Remember to press [C] [T] to enter text.

In our example the data to be used in the formulas will be in the following cells. For our example, enter the data shown for each cell:

Name	Cell	Data
Interest Rate	3;2	10.25
Principal	4;2	50000
Payments/Yr.	5;2	12
Years	6;2	30

The answer will be placed in cell 8;3.

Look at the mortgage payment formula again. To get this formula to work with Plus/4, we need to break it down into smaller pieces and then combine them to get the final result.

Exercise 19 A Complex Formula

To split up the mortgage equation, we will first evaluate the dividend and then evaluate the divisor.

Here is the dividend:

```
 Prin *   (Int/(No*100))

|        | 3;2/(5;2*#100) |→ 13;1
|        |                |
|4;2 *   |      13;1      |→ 14;1
```

In this diagram, you can see how we are going to break up the equation and where the individual parts will go.

1. Move the cursor to 13;1.

2. The first piece of the formula we are going to calculate is: (Int/(No∗100)). This expression is used twice in the formula both in the dividend and the divisor. Using the table above, this formula results in: 3;2/(5;2∗#100). 3;2 is the interest rate and 5;2 is the payments/year. Press [C=] [F] and enter this formula into 13;1. When you press RETURN, the answer is 8.54166e-03.

8.54166e-03 is scientific notation. Like BASIC, the spreadsheet uses scientific notation to represent very large or very small numbers.

3. The next expression we are going to evaluate is: Prin∗(Int/(No∗100)). We have already evaluated Int/(No∗100) in the previous step. The answer to this formula is in cell 13;1. All we need to add is Prin, which is in 4;2. The resulting formula is: 4;2∗13;1. Move to 14;1. Press [C=] [F] and type: 4;2∗13;1 [RETURN].

So far we have evaluated the dividend of the mortgage payment formula. All that is left is the divisor.

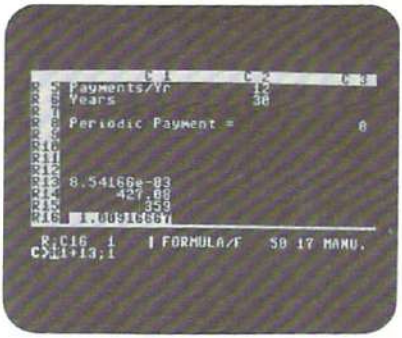
```
1-(1/((1  +      (Int/(No*100)))      ↑  ((Yr * No)-1)
                3;2/(5;2*#100)→13;1      (6;2*5;2)-#1
 →15;1
      #1  +          13;1
 →16;1
                     16;1          ↑          15;1
 →17;1
#1-(#1/              17;1
 →18;1
```

4. The next expression that needs to be evaluated is: (Yr*No) – 1. This translates into: (6;2*5;2) – #1. 6;2 is the number of years. 5;2 as we have seen above is N, the number of payments per year. Move to 15;1. Press [C=] [F] and type: **(6;2*5;2) – #1** [RETURN] .

Looking at the formula again, the areas shaded in gray have been defined so far:

$$\frac{\text{Prin}*(\text{Int}/(\text{No}*100))}{1-(1/((1+(\text{Int}/(\text{No}*100)))\uparrow((\text{Yr}*\text{No})-1))}$$

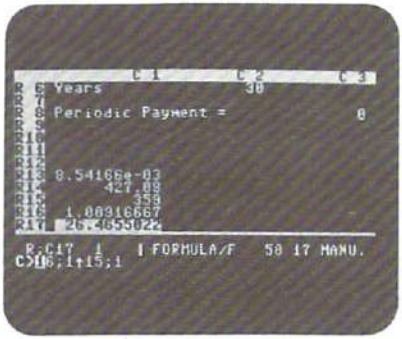
5. Next we need to evaluate: 1 + (Int/(No*100)). 13;1 contains (Int/(No*100)) so this expression translates into: #1 + 13;1. Move to 16;1. Press [C=] [F] and type: **#1 + 13;1** [RETURN] .



6. Now we can evaluate:

1 + (Int/(No∗100)) ↑ ((Yr∗No) − 1).
16;1 ↑ 15;1

Move to 17;1. Press C= F and type:
16;1 ↑ 15;1 **RETURN** .



7. We have all the pieces of the divisor. Now we have to put them together:

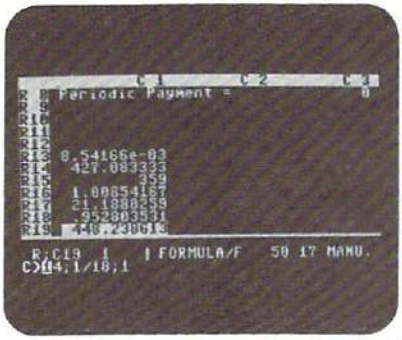
1 − (1/((1 + (Int/(No∗100))) ↑ ((Yr∗No) − 1))
#1 − (#1/17;1)

Move to 18;1. Press C= F and type:

#1 − (#1/17;1) **RETURN** .

8. The dividend is in 14;1 and the divisor is in 18;1. Move to 19;1. Press C= F and type: **14;1/18;1** **RETURN** .

9. The resulting answer should be 448.238613.



We have the answer in 19;1, but how do we get the answer displayed in 8;3?

10. Move to 8;3. Press **C=** **F** and type: 19;1 **RETURN** . What happened? 19;1 is not the answer. In Plus/4, a formula must have 2 arguments. 19;1 is only one argument Press **C=** **F** and type 19;1*#1 **RETURN** . Now the answer is correct.

Another way to put the contents of one cell into another cell is to use the ← symbol. In the example, entering the following in formula mode:

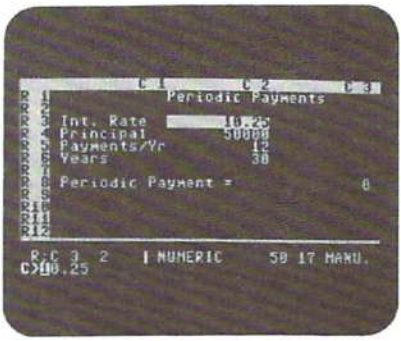
8;3 ← 19;1

will put the contents of cell 19;1 into cell 8;3. The ← is created by typing Shift =.

At this point, all the formulas are in place. Let's change a value and use automatic calculation mode.

Exercise 20 Automatic Calculations

1. Move the cursor to 3;2. We are going to change the interest rate.



2. Type: 11 RETURN . Make sure that the extra digits are erased; you can use the space bar to erase them.

3. Now press C: C and type: auto RETURN . What happened? The answer didn't change. The reason for this is Plus/4 does all its calculations by row. Consequently, the calculation for 8;3 is made before the calculation for 19;1. If you press RETURN again, you will get the correct answer because now the value in 19;1 reflects the change when the calculation for 8;3 is done.

There is a way to change the order of calculations that will be explained in the next lesson. Save the spreadsheet using the SF command and the name "mortgage."

Summary

The Color command is used to change screen color.

Complex formulas must be broken down into smaller pieces and then recombined because there is only one level of nesting permitted with parentheses.

Calculations are made by row.

LESSON 7
USING LABELS IN FORMULAS AND THE MAP COMMAND

In this lesson you will learn:

- How to use the Map command to document your spreadsheet.
- How to use text labels in formulas.

When the Blkmap command transfers data from the spreadsheet to the word processor, only 11 characters per cell are transferred. The Map command allows you to transfer all 36 characters of a cell to the word processor. The Map command is useful if you want to get a printout of your spreadsheet formulas as they are usually longer than 11 characters. The next exercise shows you how to use the Map command to get a printout of the formulas in your spreadsheet.

Exercise 21 Using Map to Document a Spreadsheet

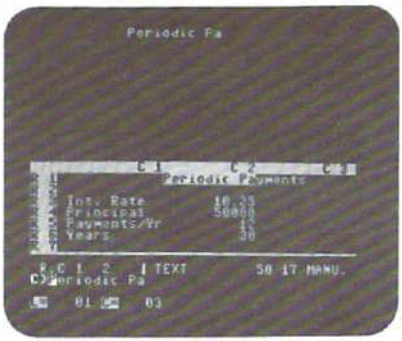
This exercise uses the "mortgage" file saved in the previous lesson.

1. Make sure the "mortgage" file is loaded into memory and displayed on the screen.
2. Put Plus/4 into half screen mode by pressing C= C and typing: ha RETURN .
3. Move to the word processor by pressing C= C and typing: tw RETURN . Like Blkmap, you must first position the cursor in the word processor when using Map. The spreadsheet data will be transferred at the last position of the cursor before you exit the word processor.

4. Move back to the spreadsheet by pressing C= C and typing: tc RETURN .
5. Make sure the cell cursor is at 1;1.

6. Press [C=] [C] and type: **map** [RETURN] . Unlike the Blkmap command, the Map command transfers data manually. That is, you have to move the cursor to a cell for the data in that cell to be transferred. Also, for the data to be transferred, it must be transferred on a row by row basis. I.e., you should move the cursor across each row of data you want to transfer.

7. Press [f2] and move to 1;2.



The text from the spreadsheet is now displayed in the word processor.

8. Press [f2] again. The rest of the title is transferred.

9. Press [f1] twice and move back to 1;1. The first row has been transferred.

10. To transfer the next row, press cursor down twice and move to 3;1. Use [f2] to move across the row and transfer the data. After this row is transferred, move back to 3;1 using the [f1] key. Continue transferring the entire spreadsheet row by row in the same manner until you reach row 13. When you have transferred the data up to this point, your screen should look like this:

11. Cell 13;1 has numbers and a formula. If you press C= F you will see the formula displayed. Notice also how the formula is displayed in the word processor as well.

To map a formula, you press C= F and then move on to the next cell as usual.

12. Press cursor down and move to 14;1. Press C= F The formula is transferred to the word processor.

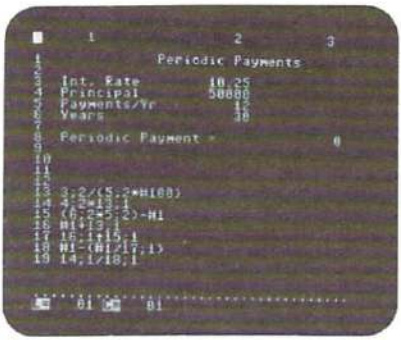
13. Continue moving down the screen and pressing C= F until you get to 19;1. Your screen should look like this:

14. Now turn off the mapping by pressing C= C and typing: off RETURN .

15. Move to the word processor (C= C tw).

16. Put the screen back into full screen mode by pressing C= C and typing: fu RETURN . You should now see your entire spreadsheet.

At this point, you could edit the word processing version of your spreadsheet and add column and row numbers for documentation purposes.



Once you have edited your word processing document, you can print it. The resulting printout should look something like this:

	C1	C2	C3
R1	Periodic Payments		
R2			
R3	Int. Rate	12	
R4	Principal	50000	
R5	Payments/Yr.	12	
R6	Years	30	
R7			
R8	Periodic Payment =		514.453498
R9			
R10			
R11			
R12			
R13	3;2/(5;2*#100)		
R14	4;2*13;1 *#100)		
R15	6;2*5;2) − #1		
R16	#1 + 13;1		
R17	16;1 ↑ 15;1		
R18	#1 − (#1/17;1)		
R19	14;1/18;1		

You will find that being able to print a spreadsheet with only the formulas shown rather than the results of the formulas will be helpful when you develop your own spreadsheet models.

In the previous lesson, you saw how a complicated formula was broken down into smaller pieces. It would have been easier to break down this equation if we could have referred to the variables in the equation by their variable name rather than a cell reference. For example, if we could have used "prin" for principal rather than 4;2 or "int" for interest rather than 3;2, figuring out the formulas would have been easier.

Plus/4 lets you give a text label to a cell and then use this text cell label in the formula instead of the cell coordinates.

Each cell in a Plus/4 spreadsheet can have, at most, two values. A cell can contain:

1. A number
2. Text
3. A formula
4. A number and some text
5. A number and a formula

Although a cell can have two values, if you put two values in every cell, you will not be able to use all 850 cells due to memory limitations. An out of memory error will occur to indicate that there is no more space available.

In the previous exercise, you saw how you could switch back and forth between numbers and formulas with C= F. The following exercise illustrates how a text cell label can be used in a formula.

Exercise 22 Text and Numbers in a Cell

This exercise uses the "mortgage" file saved on disk in the last lesson.

1. Make sure the "mortgage" file is loaded and displayed on your screen.
2. Move the cursor to 3;2. Notice that the cell currently contains just the number 11. It is possible to give the cell a text label in addition to the number.
3. Press C= T for text mode and type: **int** RETURN . If you recall, in the original mortgage equation, the interest rate was called "int." If you press C= N, you will see that the value of 11 is still in the cell. Pressing C= T again displays the text.
4. Move the cursor to 4;2. Principal was called "prin" in the original equation. Press C= T and type: **prin** RETURN .
5. Continue moving the cursor down and adding text labels so your screen looks like this:

You should have entered "no" for Payments/Yr. and "yr" for Years.

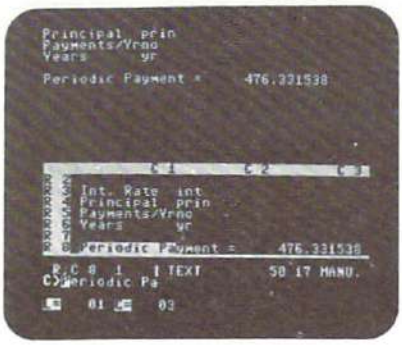
We are ready to use the labels in our formulas. Using a label in a formula is simple. You enclose the label in [ ] and treat it like a normal cell reference. For example, [int] refers to cell 3;2. Any number typed into 3;2 will be used whenever [int] appears in a formula. Using [int] is the same as using 3;2.

In Exercise 20, we used halfscreen and map to transfer data to the word processor for printing. Halfscreen and map are also useful when entering formulas.

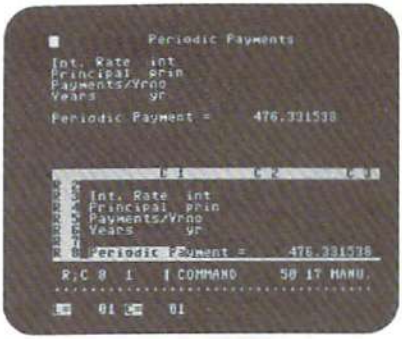
At any time, only 12 rows of cells are visible on the screen. If you are entering formulas in row 15, for example, you can't see what is in row 3. However if you put Plus/4 into half-screen mode and map the first 10 rows of the spreadsheet into the word processor, you can keep the first 10 rows of your spreadsheet displayed on the screen even when you move to the bottom of the spreadsheet.

Exercise 23 Using Labels in Formulas

1. Move to the word processor and clear memory (C= C cm). Make sure the cursor is positioned at L=01 C=01.
2. Put Plus/4 into halfscreen mode by typing: C= C ha RETURN .
3. Move to the spreadsheet by typing: C= C tc RETURN .
4. Press C= C and type: map RETURN . We are going to map the first eight rows of the spreadsheet into the word processor.
5. Use f2 , f1 , and cursor down to map rows 1 through 8. Remember to map by row using f2 to move across the row and f1 to move back to the start of the row. When you are done, the screen should look like this:



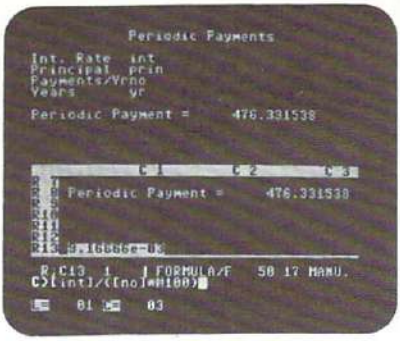
6. Now move to the word processor (C tw). Position your text on the scren so that it looks like this:



7. Move back to the spreadsheet (C tc). Position the cursor at 13;1.

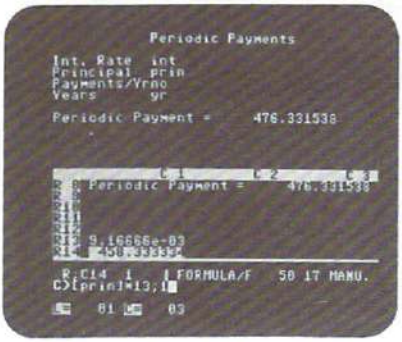
Notice that even though you have moved rows 1 through 6 of the spreadsheet off the screen, they are still displayed in the word processor. With the first eight rows of the spreadsheet on the screen in the word processor, we are ready to modify the formulas in rows 13 through 19 and replace the cell coordinates with labels.

8. Press C F. The formula for 13;1 is: 3;2/(5;2∗#100). In our original equation this formula was represented by: int/(no∗100). Now that we have labeled the interest cell as "int" and the payments per year as "no", we can modify the formula so it reads: [int]/([no]∗#100).



Edit the existing formula to match the new formula and press **RETURN** .

9. Move to 14;1. The formula in this cell: 4;2∗13;1 can be modified to read: [prin]∗13;1.



Make the correction and press **RETURN** .

10. Move to cell 15;1 and change it to read: ([yr]∗[no])-#1. The rest of the cells require no changes.

If you map the new formulas to the word processor, the results after editing, will look like this:

As you can see, using cell labels makes understanding formulas easier. This feature is especially useful if you enter some formulas and then need to modify them at a later date. It is much easier to understand a label like "int" means interest as opposed to 3;2 meaning interest.

Cell labels can also be used with the goto command. For example goto[prin]. There is also a special goto command just for labels. By typing @ and the label after pressing [CF] [C], you can move directly to the label. For example, @prin will move the cursor to the cell labeled prin.

Save this spreadsheet using the SF command. You should call the file "mortgage" again. This file will be used again in the next lesson.

Summary

The Map command is used to transfer data from the spreadsheet to the word processor manually, row by row. A cell's entire contents are transferred with the Map command.

Text labels can be used in formulas. A cell with the label "int" would be used in a formula as [int].

Additional examples of spreadsheets using labels in formulas are shown in Appendix B.

LESSON 8
IFTRUE, CHANGING THE ORDER OF CALCULATIONS

In this lesson you will learn:

- How to use the Iftrue statement in formulas.

The Iftrue command is used to evaluate an expression (such as Sum 1;1 to 3;1) and then based on whether the expression is true or false, place a value (either constant or computed) into another cell. In essence, with the Iftrue command, you can modify the normal order of calculation.

Iftrue can use the following operators in its expressions:

Operator	Meaning
=	Equal to
>	Greater than
<	Less than
nte	Not Equal to
not	Not true

Iftrue also uses the ← to indicate the cell affected as a result of the Iftrue. The ← is created by typing (Shift =).

In the mortgage payment example, the answer, which was in Row 8, would not be displayed correctly in automatic mode unless you pressed RETURN a second time. With the Iftrue command, you can get the correct answer the first time as shown in the following exercise.

Exercise 24 Iftrue

This exercise uses the "mortgage" file saved previously.

1. Load the "mortgage" file and make sure it is displayed on the screen.
2. Move the cursor to 8;3.
3. The value for cell 8;3 comes from cell 19;1. Under normal operation the value for 8;3 is calculated before cell 19;1 is updated. Using Iftrue, we can eliminate the formula in 8;3 and cause the value to be entered for this cell after the value is calculated for cell 19;1. Delete the formula in 8;3 using the space bar or the Delete key.
4. Move to 20;1. The formula we will enter in 20;1 will use Iftrue as follows: 19;1>#0iftrue8;3←19;1.
   What this formula means is: If 19;1 has a value greater than 0, then put the value of 19;1 into 8;3. 8;3 ← 19;1 means put the value of 19;1 into 8;3.

5. Enter the values shown below:
   Int Rate 10.5
   Principal 50000
   Payments 12
   Years 30
   You may have to press C= N before entering each of these values because of the cell labels entered in the previous exercise. C= N activates numeric entry mode.

6. Activate Automatic Calculation mode by pressing C= C and typing: **auto** RETURN . Your screen should look like this:

   The correct answer is displayed immediately.

7. Try entering different numbers for interest rate and principal, etc. and note how the answer is displayed immediately. The Iftrue statement has effectively changed the order of calculation.

Iftrue is a very powerful command. It can be used in many different applications to evaluate various cells and draw conclusions from the data and take action based on these conclusions. Iftrue used in formulas always has three components:

1. The expression to be evaluated. This expression can use the operators described above and can refer to a cell or a formula.
2. The iftrue or notiftrue (false) command.
3. The action to be taken if the expression is true or false. The action taken is a transfer of data to a cell. The data transferred can be a cell, a numeric constant, or the result of a formula.

Summary

Iftrue can be used in formulas to change the normal order of calculations in automatic mode. Iftrue can use the following operators:

Operator	Meaning
=	Equal to
>	Greater than
<	Less than
nte	Not Equal to
not	Not true
←	Indicates the cell where a new value will be placed

Some examples of Iftrue are:

3;2+4;2>#0iftrue20;2←(3;2+4;2)

19;1=#0iftrue18;4←19;1

15;10nte#0iftrue2;2←(2;2*#4)

6;2=#100notiftrue7;2←#100

SPREADSHEET SUMMARY

You have now learned how to use most of the features of the Plus/4 spreadsheet. The following list summarizes the commands.

Cursor Movement / Special Keys

Between cells:

↓—moves the cursor down

↑—moves the cursor up

f2—moves the cursor right

f1—moves the cursor left

Within a cell:

cursor right, cursor left, insert, delete

Commands

All the commands are activated by pressing C= C. Commands are listed alphabetically. Commands with a * were not explained in the self-teaching guide. Commands are always entered in lower case.

Auto—Automatic Calculation

causes calculations to be performed automatically by row, starting with row one.

Blkmap—Block Map

transfers a block of data from the spreadsheet to the word processor. First, position the cursor at the point in the word processing document where you want the data transferred. Move back to the spreadsheet and position the cursor in the upper left corner of the block of data you want to transfer. Specify the cell that corresponds to the lower right corner of the data to be transferred. Seven columns and 50 rows of data maximum can be transferred at one time. For example, Blkmap6;6 with the cursor in cell 1;1 will transfer 1;1 through 1;6, 1;2 through 6;2, 1;3 through 6;3, 1;4 through 6;4, 1;5 through 6;5, and 1;6 through 6;6. Only 11 characters per cell will be transferred. Once data is transferred to the word processor, it can be printed.

Ca—Catalog

lists the contents of a diskette and shows how much space is available on the diskette. Spreadsheet files have a ".c" in the title.

Cco—Column Copy

copies a column to the current column. If data is in the column, it will be overwritten. Copied formulas are not adjusted. For example: cco1; will copy column 1 to the current column.

Cdel—Column Delete

deletes the current column. If a column delete causes columns to shift to the left, then formulas in the shifted columns may need to be reentered to reflect the shift.

Cins—Column Insert

causes a new column to be inserted. If a column insert causes any columns to shift to the right, then the formulas in the shifted columns may need to be reentered to reflect the shift.

Cm—Clear Memory

used to delete a spreadsheet from memory.

Color

causes the screen background color to change according to the following table. For example, color0, changes the background to black.

Number	Color
0	Black
1	Gray
2	Red
3	Cyan
4	Purple
5	Green
6	Blue
7	Yellow
8	Orange
9	Brown
10	Yellow Green
11	Light Red
12	Blue Green
13	Light Blue
14	Dark Blue
15	Light Green

Copy

used to copy any cell to the current cell. For example, copy6;5 will copy cell 6;5 to the current cell. Formulas are not adjusted with this command.

Df—Delete File

deletes a disk file permanently.

Fit

used to copy a formula from any cell to the current cell. The row and column numbers in the formula will be adjusted based on the distance the current cell is from the copied cell. For example, if cell 2;3 has the formula 2;1 + 2;2 and the cursor is in 3;3, if you fit 2;3, the resulting formula in 3;3 will be: 3;1 + 3;2.

Fl—Floating Point

used to put numbers into floating point format. Floating point is the default mode for the Plus/4 spreadsheet.

***Format**—Format a Disk

this command will format a data disk for use with Plus/4. With the Format command, you need to enter a title and a disk id, separated by a comma. For example Plus/4 disk,01. The title may be up to 16 characters in length; ids must be 2 characters. For more information, see Appendix A.

***Fre**—Freeze a Cell

This command will lock in the value of a cell. A frozen cell cannot be changed in any way until the cell is unfrozen with the Thaw command. An asterisk is displayed on the status line when a cell is frozen. Frozen cells are also not shifted during row or column insertions or deletions. When a cell is frozen, it cannot be moved. The Freeze command is useful if you want to be absolutely certain that, no matter how much you modify your spreadsheet, the frozen cell or cells will not be changed in any way.

Fu—Full Screen

used to put the screen into full screen display mode. In full screen mode, the word processor can display 22 lines or the spreadsheet can display 12 rows. This command can be used in either the spreadsheet or the word processor.

Goto

will move the cell cursor to the cell specified. For example, goto6;12 will move the cursor to cell 6;12.

Ha—Half Screen

used to split the screen for windowing. In half screen mode, a spreadsheet and a word processing document can be displayed on the screen simultaneously. In this mode, seven rows of the spreadsheet and 12 lines of the word processor can be displayed. This command can be accessed in both the word processor and the spreadsheet.

Home

used to move the cursor to cell 1;1.

***Id**—Initialize Disk

used when loading a file from one diskette and saving that file on another diskette. The id command should be executed just before the save.

In—Integer Format

used to display numbers as integers.

***Leftj**—Left Justify

used to left justify numbers in a cell.

Lf—Load File

loads a file from disk into memory.

Man—Manual Calculation

in this mode, a formula is only calculated when you enter the cell and press RETURN. Manual is the default calculation mode for Plus/4.

Map

used to transfer data from the spreadsheet to the word processor. With the Map command, the data is transferred manually, row by row. Before the transfer, you must position the cursor in the word processing document at the point where you want the data to be transferred. Then you move to the spreadsheet and use f2, f1, and cursor down to move from cell to cell, by row, and transfer the data. The Map command is easiest to use when the spreadsheet and word processor are both displayed on the screen. With the Map command, all 36 characters of a text or formula cell are transferred. Map or Blkmap must be used to print a spreadsheet.

Off—Map Off

turns off the Map command.

Rco—Row Copy

copies a row to the current row. If data is in the current row, it will be overwritten during a row copy. Formulas are not adjusted during a row copy. For example, rco3; will copy row 3 to the current row.

Rdel—Row Delete

deletes the current row. If a row delete causes rows to shift up, then any formulas in the shifted rows may need to be reentered to reflect the shift.

***Reset**

clears all memory, erases any data and starts Plus/4 over again.

***Rightj**—Right Justify

causes numbers to be right justified in a cell. This is the default mode.

Rins—Row Insert

causes a new row to be inserted. If a row insert causes any rows to be shifted down, then the formulas in the shifted rows may need to be reentered to reflect the shift.

Sf—Save File

saves the spreadsheet currently in memory to disk.

***Thaw**

used to cancel a freeze of a cell.

Tw—To the Word Processor

used to move from the spreadsheet to the word processor. In half screen mode, both the spreadsheet and the word processor are displayed on the screen simultaneously when this command is executed.

$$—Dollar Format

used to display numbers to two decimal places, e.g., 65.75 or 198.27

C= q

repeats the previous command. This command does not require C= C to be typed first.

Command Defaults

When you initially enter the spreadsheet, the following command defaults are in effect:

Floating Point Format

Full Screen Display

Right Justified Numbers

Map Off

Manual Calculations

Color 12;

Formulas/ Data Entry

A Plus/4 cell can contain numbers, text, formulas, numbers and text, or numbers and formula. The default mode of data entry is numeric.

To enter text, press C= T.

To enter formulas, press C= F.

To enter numbers after text, press C= N.

The data entry mode is displayed on the status line.

Formulas are evaluated from left to right. One level of parentheses can be added to a formula to change the order of evaluation. A cell used in a formula must be in r;c format, where r is the row number and c is the column number of the cell. For example, 3;6 refers to the cell at row 3, column 6.

Numeric constants used in formulas must be prefixed by a #. For example, #100 or #0.

Text labels may also be used in formulas if they are enclosed in brackets. For example, +sales|. Any cell that does not contain a formula can have a text label. Text labels are entered as normal text.

The following commands are valid in formulas. Commands with a * were not explained in the self-teaching guide.

Arithmetic Operators

+ Addition
− Subtraction
* Multiplication
/ Division
↑ Exponentiation

The following commands may be used by themselves or combined by any of the arithmetic operators.

***ABS**—Absolute value

Examples: abs3;5 abs# − 100

***ATN**—Arctangent in radians

Examples: atn6;9 atn#.5

***COS**—Cosine in radians

Examples: cos4;10 cos#.25

***DIV**—Division

This command is used to divide a row or column of numbers in a series.

Example: div1;1to4;1 will divide 2;1 by 1;1. 3;1 will then be divided by the resulting answer. 4;1 will then be divided by the next resulting answer.

***EXP**—Exponent

Calculates the constant e (2.71828183) raised to the power of the number given.

Example: exp#50 exp2;4

***LOG**—Logarithm

Example: log6;5 log#40

***MAX**—Maximum

This command will compute the largest number in a row or column.

Example: max 5;1 to 5;6

***MIN**—Minimum

This command will compute the smallest number in a row or column.

Example: min2;1 to 6;1

***MLT**—Multiply

This command will multiply a series of numbers in a row or column.

Example: mlt1;2 to 3;2

***SIN**—Sine in radians

Examples: sin6;12 sin#1

***SUB**—Subtraction

This command will subtract a series of numbers in a row or column.

Example: sub1;1 to 3;1 will subtract 1;1 from 2;1. The resulting answer will be subtracted from 3;1.

SUM—Sum

This command will add a series of numbers in a row or column.

Example: sum 4;5to4;12

***TAN**—Tangent in radians

Example: tan18;6 tan#.5

IFTRUE

Iftrue is used to evaluate an expression and then, based on whether the expression is true or false, will place a value into another cell. Iftrue can be used to modify the normal order of calculation. Normally, a Plus/4 spreadsheet in automatic mode will calculate formulas row by row, starting with row 1. Iftrue allows you to calculate a value in a higher row and then put this value into a lower row.

Iftrue can use the following operators:

Operator	Meaning
=	Equal to
>	Greater than
<	Less than
nte	Not Equal to
not	Not true
←	Indicates the cell affected by the outcome of the iftrue.

An iftrue formula has three parts:

1. An expression using any valid Plus/4 formula, cell, or numeric constant and any of the operators. For example:

   3;1<#10

   4;2=5;2

   3;1+6;2nte#100

2. Iftrue or notiftrue

3. Cell ← Expression. The value of the expression will be transferred to the cell indicated if the expression preceding the iftrue or notiftrue evaluates true or false. For example:

   16;5<#200iftrue8;3←16;5

   translates into:

   If the value in 16;5 is less than 200, then put the value of 16;5 into cell 8;3.

   19;1+20;1=#0notiftrue5;4←20;1

   translates into:

   If 19;1 + 20;1 is not equal to 0 then transfer 20;1 into 5;4

GRAPHICS

The saying that a picture is worth a thousand words is never more important than when you are trying to show relationships between numeric values.

The graphic capability in the Plus/4 rounds out the software products. This program is really a feature of the Spreadsheet but is given its own section in the manual because it is important.

We have tried again to decide on a mix of power and easy use. The graphic section in the Plus/4 allows you to graph any row inside the spreadsheet and print it to the screen for viewing or to 'map' it into the word processor to be printed or incorporated into a document.

You will notice we have chosen to use character graphics and not high-resolution graphics. Obviously, since the Plus/4 has substantial high-resolution graphic capability, we could have done so. However, we did not, for one very important reason: If you have the ability to integrate the graph into the word processor, it must be in characters printable by any Commodore Printer.

The graph will give you a good relative comparison between values in the spreadsheet, and with the integration ability of the word processor, these comparisons can be placed inside a document. When the graph is inside the word processor it can be edited just like another text, giving the user complete control over labeling and creative adjustments.

Please study the tutorial for examples of how to get the most from the graphics program.

With a little luck, could a good graph of income against expenses get you a raise?

INTRODUCTION

This chapter of the manual introduces you to Plus/4's graphing capabilities.

Graphs are diagrams that illustrate information. They are used to present information in an easy-to-understand manner. Many people have trouble understanding relationships between rows and columns of numbers. Using a graph, the same information can be presented in a way most people can understand. A graph usually does not contain all the information on a particular subject, but highlights major aspects.

Plus/4 can produce simple, low resolution bar or point graphs that can be integrated into a word processing document and printed on virtually any printer. A bar or point graph can be produced from any row of data in a Plus/4 spreadsheet. Plus/4 will automatically scale the graph based on the highest and lowest value of the data.

The graphing option of Plus/4 is simple to use. Consequently, this chapter contains only one lesson.

LESSON 1 CREATING GRAPHS

In this lesson you will learn:

- ☐ How to create a bar graph.
- ☐ How to create a point graph.
- ☐ How to print a graph.

A bar or point graph can be created from any row of data in a Plus/4 spreadsheet. As the graph is being created, it can also be mapped to the word processor. Once the mapped graph is finished, it can be edited and printed like any other word processing document.

Exercise 1 Creating Graphs

1. Make sure you have a blank word processing document and a blank spreadsheet.
2. Make sure you are in the spreadsheet.

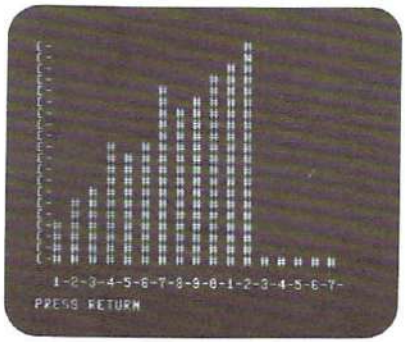
   In our graphing example, we will enter a row of numbers and graph them. It doesn't matter how the numbers are generated. Any row of numbers can be graphed with Plus/4.
3. Type in the following numbers:

Cell	Number
1;1	100
1;2	150
1;3	200
1;4	300
1;5	275
1;6	325
1;7	450
1;8	390
1;9	425
1;10	480
1;11	525
1;12	600

4. In this exercise, we are going to map the graph to the word processor as it is created, so press C= C and type: **map** RETURN . When a graph is mapped to the word processor, it is always mapped to L=01 C=01. To use a graph in a word processing document, you either have to insert lines above the graph or save the graph and use the Merge File command to insert the graph at the proper place.

5. Position the cursor anywhere in row 1. During graphing, column position of the cursor is not critical.

6. Press C= C and type: **gr** RETURN . Gr is the Graph command.



There is no scale on the left side of the graph. The scale was left off intentionally so you could add any scaling you wanted. The numbers along the bottom of the graph refer to the column numbers of the row that was graphed. All 17 columns of a Plus/4 spreadsheet can be graphed at once.

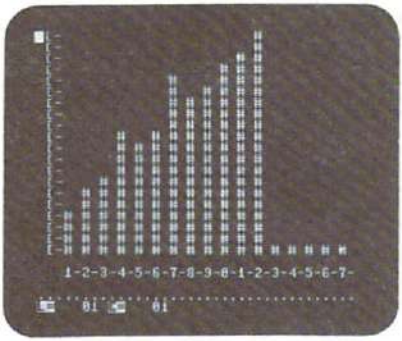
Plus/4 also performs automatic scaling based on the highest and lowest values entered. If you press RETURN , as indicated, you will return to the spreadsheet.

Now type: C= C goto50;16 RETURN. Cell 50;16 contains the scaling factor for each unit of the y (vertical) axis of the graph. A Plus/4 graph always has 20 vertical units. In our example, each unit has a value of 30. This number is helpful when you are labeling your graph. It cannot be modified.

Exercise 2 Labeling a Graph / Point Graphs

The graph created in the previous exercise is now in the word processor ready for editing. We are going to label the graph.

1. Move to the word processor (C= C tw). Your screen should look like this.



This graph could be printed as is using the *p or pr commands. But let's assume our graph represents monthly sales for the past year. We want to edit the graph and add a title, scaling, and identify the months at the bottom of the screen.

This graph could be saved as a normal text file and then merged with other documents.

To create a point graph, you simply edit the graph with the space bar and space over all but the highest # in each column of the graph. A sample point graph looks like this:

Monthly Sales for ABC Company

```
i        [-                                          #
n    600 [-
         [-                                      #
t        [-                                  #
h    500 [-                              #
o        [-                          #
u        [-                      #
s    400 [-
a        [-
n        [-            #       #
d    300 [-                #
s        [-
         [-
o    200 [-        #
f        [-    #
         [-
$    100 [- #
         [-
         [-
         [-
             J   F   M   A   M   J   J   A   S   O   N   D
             a   e   a   p   a   u   u   u   e   c   o   e
             n   b   r   r   y   n   l   g   p   t   v   c
```

The graphing options of Plus/4 are simple, but allow you to create useful graphs that can be combined with word processing documents and spreadsheet data.

Summary

Graphs can be produced for any row of data in a spreadsheet.

Plus/4 automatically scales the graph. The units for the scaling are contained in cell 50;16.

To create a graph that can be edited, printed, and saved, use the Map and Gr commands.

Once a graph is in the word processor, it can be edited, have labels added, be printed, and saved.

A saved graph can be merged with existing documents.

FILE MANAGER

The term "Database" is often overused and certainly means different things to different people. Inside the Plus/4 computer, the term is used simply to describe the ability to create a form through which you can store information and retrieve it later.

One of the most important features of our filing system is that since you design your own form for the information, everyone can design something meaningful to them.

You have up to 17 pieces of information, each of which may be up to 38 characters long, in each record or form you wish to file. Depending on the amount of information you have defined to the computer, you may have up to 999 records, any one of which is available to you with a simple command.

One of the easiest examples of what you might use this type of program for is a mailing list for a club or organization. If we describe to the computer that we want to keep track of a person's name, address, phone, membership status, dues, etc., then the database will be generated in that form. We can then add, delete or change people on the database at will. If we wanted to select only those people living in a certain town or state, then sort them by Zip Code, we could do so.

The concept of integration comes in when we want to mail a letter to the above people. We can take the specific information from the database and personalize each letter by name and address, insert dates and other information as needed, then print them continuously.

This program contains all the features needed to make it very competitive but we have designed it to be easy to set up and use. So please read the tutorial very carefully, as a complete understanding of "how and why" things operate as they do is essential.

This program, with its integration capability to the word processor, make it one of the most powerful of the four programs in the Plus/4. With this power, tasks from collection letters to your own Christmas list become simple chores.

INTRODUCTION

This chapter of the manual introduces you to the Plus/4 File Manager. First, a brief explanation of what a file manager is has been included for beginners.

The best way to learn about a file manager is to use one. That's why the remainder of this chapter is a self-teaching guide that will instruct you how to use and take advantage of the functions the Plus/4 File Manager provides. You will learn how to design your own files, search for data in your file, produce reports, and integrate the File Manager with the Word Processor for form letters.

At the end of this chapter is a summary of all the File Manager commands.

WHAT IS A FILE MANAGER?

A file manager is used to store and retrieve information on a computer. This information is called a data base or a file. Some examples of data bases that can be implemented with Plus/4 are:

- Mailing Lists
- Inventory
- Personnel Files
- Collections
- Recipes
- Bibliographies

The most common file management application is a mailing list. With a non-computerized mailing list, the data is kept in a book or a Rolodex-type file. With a computerized mailing list, the entries are typed in on the video screen and stored on a diskette.

With a non-computerized mailing list, if you want to find a particular entry, you have to flip through pages of a book or cards until you find what you are looking for. With a computerized mailing list, you type a command, type the information you are searching for, and the computer will search for the data for you.

An additional capability of a computerized mailing list is the ability to sort information regardless of the order the data was entered. You could, for example, sort a mailing list alphabetically or by zip code.

The resulting benefits of a computerized mailing list or other file manager application are:

- You can manipulate and reorganize data quickly and easily.
- You can retrieve data quickly.
- The data is legible (not handwritten).

A computerized database is slightly different than an address book or a rolodex file. First, you enter your data from a keyboard and it is displayed on your video screen. Second, the data is stored on a diskette. Third, the data has a predefined format (which you define). All entries must use this format.

Each entry in a file manager is called a record. The individual pieces that make up a record are called fields. Many records make up a file.

Field 1	Field 2	Field 3	Field 4	
John Smith	100 Main Street	Anytown	PA	1
Jane Doe	1525 Oak Lane	Springfield	NJ	2
Bill Brown	900 Broadway	Anytown	PA	3

Record

File

In a mailing list, for example, a record would be all the information about one person. The fields for each record would be:

First Name

Last Name

Address

City

State

Zip Code

Telephone Number

In order for the file manager to organize the data on the diskette, you must also specify how many characters of data are to be entered for each field. For example, state could be two characters (e.g., PA) and zip code could be five characters (e.g.,19001). The File Manager needs to know how much data is going to be entered for each field so it can organize the data efficiently.

For every file you wish to use, you have to specify the fields and field sizes once, when you start. Because the fields are specified to suit your needs, the Plus/4 File Manager has many different uses. As you become more familiar with the capabilities of the Plus/4 File Manager, you'll discover new applications for it.

SELF-TEACHING GUIDE

The Plus/4 File Manager is similar to the Plus/4 Word Processor and Spreadsheet. Press C= C for command mode, type in a command, then execute the command.

The self-teaching guide for the File Manager is similar to the other self-teaching guides in this manual. Each lesson builds on information learned and examples created in previous lessons.

As with the other chapters, do not try to complete all the lessons in this chapter in one sitting unless you are an experienced file manager user. Go slowly and practice each new command several times. At the end of each lesson is a summary of the material covered in the lesson. These summaries make convenient stopping points where you can practice on your own. Once you have mastered one aspect of the program, then continue to the next lesson.

Some of the commands available in the Plus/4 File Manager are not explained in the self-teaching guide. They are, however, explained in the summary at the end of this chapter.

GETTING STARTED

1. Make sure your computer, disk drive, printer, monitor or television screen are connected properly and turned on.
2. To perform the exercises in this chapter, you will need a diskette. The diskette will be overwritten entirely by the Plus/4 File Manager data, so do not use a diskette with important data. You do not need to format the diskette. Plus/4 will do that for you.
3. Activate Plus/4 by pressing **f1**. After the SYS is displayed, press **RETURN**. At this point, you are in the word processor.

You will learn how to move to the File Manager in the following lesson.

LESSON 1 CREATING A FILE FORMAT

In this lesson you will learn:

- How to create a file format.

Before you can use the Plus/4 File Manager to manage data, you have to design your file. Designing a file entails identifying all the fields you will be using in your record and determining the length of each field.

The Plus/4 File Manager has the following file specifications:

17 fields (maximum)
1 to 38 characters per field
999 records per file (maximum)

You should design your file on paper first before you use Plus/4. Here are some tips to consider when designing your file.

1. For a mailing list or any application that keeps track of names, have separate fields for last name and first name. This makes sorting easier.
2. Always use two fields for address. This will allow you to enter apartment numbers, PO Box, etc.
3. Use the two letter postal service abbreviations for states. In this way you will have consistent data.
4. Try to keep each field as short as possible but long enough to avoid abbreviations. Fields that are too long cause inconsistent entries for the same information. For example, you could enter Pennsylvania, Penna., or PA if state was a long field. If you have fields that are too short and you are forced to abbreviate data, you will probably end up abbreviating the same data in different ways.
5. Keep your reports in mind when designing your file. If you need a report sorted by city, make sure you have a separate field for city.
6. In general, each field should have one piece of information in it. For example, it is better to have separate fields for city, state, and zip code rather than just one field that contains all this data.

In this chapter, we will design a mailing list application that will be used to produce an alphabetical list of all the people on the list, sorted by last name and labels, sorted by zip code. Here is the file design we will use:

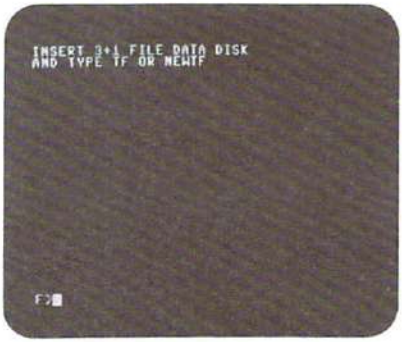
Field Name	Length (in characters)
First Name	20
Last Name	20
Address 1	30
Address 2	30
City	25
State	2
Zip Code	5
Telephone	12

The field lengths chosen are based on experience and intuition. It is important to remember that in your own applications, the file design can be whatever you want it to be as long as it meets the specifications of Plus/4. This flexibility is what makes a file manager a useful tool.

Now that we have a file design, we can implement the design and set up a file.

Exercise 1 Setting up a File

1. Move to the file Manager by pressing C= C and typing tf RETURN . TF stands for **T**o the **F**ile Manager.



Like the spreadsheet, the File Manager is usually in command mode.

2. Insert a diskette into the disk drive. This diskette will be overwritten by the File Manager. Do not use a diskette that has important data on it because it will be erased.

3. Type: **newtf** **RETURN** . Newtf is the command you use whenever you create a new file format with the Plus/4 File Manager.

4. The next prompt is: ENTER FILE NAME (1..16). Every file used with the Plus/4 File Manager must have a file name. Names can be up to 16 alphanumeric characters long. In our example, we are going to call the file: mailing list. Type: **mailing list** **RETURN** .

5. At: ENTER NUMBER OF FIELDS (1..17)

   01; type: 08; **RETURN** . It is important that you include the 0 and the ; in the entry. In all the numeric entries for setting up your file, make sure you have the ; as the last character of your entry. At this point your screen should look like this:

6. The next series of entries are used to enter each field name and the length of each field. A field name can have a maximum of 35 characters. Enter the following information for the next series of prompts. After each entry, press **RETURN** . You will notice that the previous entries scroll up the screen as you enter the information. Don't worry if you make a mistake, you'll have a chance to edit your entries.

Field No.	Field Name	Field Length
01	First Name	20;
02	Last Name	20;
03	Address 1	30;
04	Address 2	30;
05	City	25;
06	State	02;
07	Zip Code	05;
08	Telephone	12;

7. After you have made all the entries, your screen should look similar to this:

```
MAILING LIST  08;
FIRST NAME 20;
LAST NAME 20;
ADDRESS 1 30;
ADDRESS 2 30;
CITY 25;
STATE 02;
ZIP CODE 05;
TELEPHONE 14;
TOTAL RECORDS 918

OK TO FORMAT DISK? Y/N
```

On the first line, the filename and the number of fields in the file are shown. Following this line, each field and its associated field length are displayed. Finally, the total number of records that will fit on a diskette are shown. The number of records available for a file will vary, based on the total size of a record.

At OK TO FORMAT DISK? Y/N, if you type N, you will be able to go back and edit your field information. If you type Y, the disk will be formatted and your file will be set up on the disk. If all the entries are correct, press Y. Otherwise press N and edit the data.

8. At ARE YOU SURE? Y/N, if you type N, you will be returned to the beginning of the option. If you type Y, the disk will be formatted and any existing data on the disk will be erased.

After the disk is formatted, you will see dots displayed on your screen. These dots indicate space is being allocated for your file on the disk. After the disk set up is complete, a catalog of the diskette will be displayed as shown below:

```
"mailing list    " tf 2a
  116 blocks free.

:PRESS RETURN
```

The Plus/4 File Manager uses a special diskette format that doesn't use the normal disk directory. You can see, however, how much space is available on the disk. This extra space is used for sorting files.

It is important to remember that a diskette used with the Plus/4 File Manager should only be used with the Plus/4 File Manager. You should not save word processing or spreadsheet files on a file manager diskette under normal circumstances.

Summary

The Plus/4 File Manager has the following specifications:

17 fields maximum

38 characters per field maximum

999 records per disk maximum

To use the file manager, you must design your file and enter the file specifications. For each file, you need to define the number of fields and the length of each field.

Only one Plus/4 File Manager application can go on a diskette.

Word processing and spreadsheet files should not be saved on a Plus/4 file manager diskette.

LESSON 2
ENTERING DATA INTO YOUR FILE

In this lesson you will learn:

- ☐ How to enter data into your file.
- ☐ How to use the RC command.
- ☐ How to use the UD command.
- ☐ How to use the NR command.

In the previous lesson, you created a mailing list file. In this lesson, you will learn how to enter data into the file.

Exercise 2 Data Entry

This lesson uses the diskette created in the previous lesson.

1. Make sure the File Manager is displayed on your screen.

2. At F>, type: tf RETURN . Plus/4 will now display the file name, the number of records available, and the last record number entered.

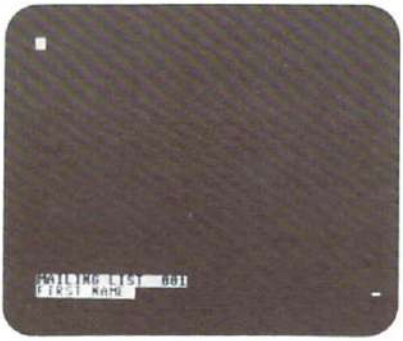
Any time you type tf while in the Plus/4 File Manager, you will get the file status information shown above.

3. We are now ready to enter a record into our file. The first method of entering a record uses the RC (Record) command. Type: **rc1;** **RETURN** .

   The RC command has two functions:

   a. It can be used to enter a specific record by number.

   b. It can be used to retrieve a record from disk. The RC command allows you to enter records in any order. For example, typing rc800; will let you enter record 800. Each record in the file has a unique record number. The RC command uses the record number to locate the record.



   On your screen, you should see a cursor in the upper left corner. At the bottom of the screen are two status lines. The first status line shows the file name and the record number of the record displayed on the screen. The second line shows the current field name. At this point, Plus/4 is waiting for you to type in data for field one, first name.

4. Type: **John** **RETURN** . Notice how the status line changes when you press **RETURN** . Pressing **RETURN** moves you to the next field, in this case, last name.

5. Type: **Smith** **RETURN** . Your screen should look like this:

Entering data into a Plus/4 file is simply a matter of typing the information for the indicated fields and pressing **RETURN** . To move back to a previous field, press the cursor up key. To move down to the next field, press cursor down or **RETURN** . Within a field, you can use cursor right, cursor left, insert, and delete in the same way that you could use these keys to edit cells in the spreadsheet or lines of text in the word processor.

6. Continue entering data for this record as follows:

Field	Data Entered
Address 1	125 Main Street
Address 2	**RETURN**
City	Anytown
State	PA
Zip Code	19000
Telephone	215-123-4567

When you press **RETURN** after entering the telephone number, the cursor moves to the beginning of the field.

To file the data you entered requires the UD (Update Record) command.

7. Press C. At F>, type: **ud** RETURN . Plus/4 will now take the data you entered on the screen and file it on disk.

8. Use the rc command and enter the following information for record 2. To begin, type: **rc2;** RETURN .

Field	Data Entered
First Name	Thomas
Last Name	Brown
Address 1	Apt. 311
Address 2	Park View Apartments
City	Anytown
State	PA
Zip Code	19000
Telephone	215-123-9876

To file record 2, type: C **ud** RETURN .

At this point, you have two records in your file. Type: **tf** RETURN and you will see the status message displayed shows you entered two records and that the last record entered was record 2.

The RC command can also be used to retrieve and display a record from disk. Type **rc1;**. You should see record one displayed on your screen. This record could now be edited in any way and then refiled with the UD command.

Using the RC and UD commands to enter records is fine if you don't have a large amount of data to enter. If you have a large number of records to enter, the NR (Next Record) command combines RC and UD and saves keystrokes.

Exercise 3 Next Record Command

1. Make sure you are in the file manager and that the mailing list diskette is in the disk drive.
2. Press C= C and type: tf RETURN . Note that the last record entered was record 2. When you use the NR command, you must first display the last record entered on the screen.
3. Type: rc2; RETURN . Record 2 is now displayed.

4. Press C= C and type: nr RETURN . The NR command files the record currently displayed on the screen and automatically performs an RC for the next record.
5. You are now ready to enter record 3 with the following data.

Field	Data Entered
First Name	Carole
Last Name	Williams
Address 1	12 Lantern Lane
Address 2	RETURN
City	Anytown
State	PA
Zip Code	19000
Telephone	215-123-7788

After you have entered record 3, press [C=] [C] and type: nr [RETURN] instead of UD. Record 3 will automatically be filed and you will be ready to enter record 4.

6. Enter Record 4 as follows. Use UD to file the record this time.

Field	Data Entered
First Name	Paul
Last Name	White
Address 1	PO Box 44
Address 2	Evergreen Road
City	Smalltown
State	PA
Zip Code	19002
Telephone	215-123-5444

At this point, you should have four records in your file. (Try typing tf at F>.) You can retrieve and display any of these records using the RC command.

The RC command is adequate if you have a small file. However, when you have a large file, using RC to retrieve a record requires that you remember all the record numbers. This is cumbersome and defeats the purpose of the computer.

In the next lesson, you will learn two new commands that make data retrieval easier and faster.

Summary

The RC (Record) command is used to enter a record or display a record on the screen. For example, rc4; will display record 4. Once a record is displayed, it can be edited.

The UD (Update Record) command is used to file the record currently on the screen. UD can also be used with a record number. For example, ud7; will file the record on the screen as record 7 regardless of the record number used to display the record. Using UD in this way allows you to enter similar records without having to reenter all the data.

The NR (Next Record) command is used to enter a new record, update the record, and increment the record counter automatically so you can enter another record.

LESSON 3 REVIEWING DATA/ SEARCHING FOR RECORDS

In this lesson you will learn:

- How to use the RV (Review) command to find a record.
- How to use the SR (Search) command to find a record.

In the previous lesson, you used RC to retrieve and display a record by its number. The RV (Review) command will automatically display a series of records quickly. With the RV command, you can stop the display at any time for editing.

Exercise 4 Review

1. Make sure that you are in the File Manager and that the mailing list diskette is in the disk drive.
2. Press C= C. At F>, type tf RETURN .
3. Type: rv1; RETURN . The RV (Review) command causes records to be displayed quickly, starting with the record number specified, in this case, one. You can start the review at any record number. For example, rv3; will start the review with record 3.

   While records are being displayed, pressing and holding S will freeze a record on the screen. Pressing and holding Q will stop the review.

The Review command is very useful if you need to scan a database quickly. If you need to be able to retrieve records by the contents of the records rather than the record number, you can use the SR (Search) command. The Search command starts at record one and searches sequentially through your file until a record is found that matches the data you are searching for.

Exercise 5 Search

1. Make sure you are in the File Manager and that the mailing list diskette is in the disk drive.
2. Press C= C and type: sr RETURN .
3. Plus/4 will now prompt: SEARCH:

   At this point, you can enter the data for the record you are searching for. Let's assume we want to find the record of Carole Williams. To find her record using the search command, we could type data that matched the data in any field of her record. We could type Carole, Williams, Car, or Will, for example. The data you enter for your search can be no longer than 38 characters, which is the maximum field length. Also, your search data cannot

extend over multiple fields. For example, to find Carole Williams, you could not type Carole Williams, because Carole is in field 1 and Williams is in field 2. The Search command also does not distinguish between upper and lower case letters. To search for Williams, you could type Williams or williams.

Type: **Carole** **RETURN** to initiate the search. After you press **RETURN** , Plus/4 will start searching through your file until it finds a record with Carole in it in any field of the record. In our case, record 3 has Carole as field 1.

Once Plus/4 finds a record that matches your search data, it asks you if you want to continue to search for more records that match. If you type Y, the search will continue. If you type N, the search will end and you will be back in command mode. To edit the record on the screen, type: rc **RETURN** .

The Search command provides a useful way to locate a record quickly based on the contents of the record.

Summary

The RV (Review) command is used to scan through records sequentially starting with the number you specify. For example, rv5; will start the review with record 5. Pressing S will freeze the review. Pressing Q will end the review.

The SR (search) command is used to locate a record(s) based on the contents of the record(s). Searching is done on a field-by-field basis. If the search data you type matches the data in any field of a record, the record will be displayed.

LESSON 4 SORTING YOUR FILE/ CREATING A REPORT

In this lesson you will learn:

- ☐ How to sort the data in your file.
- ☐ How to print a report.
- ☐ How to cancel a sort subfile

One of the main advantages of a computerized file manager is its ability to sort the data in your file. For example, in some instances, you might want to list your mailing list in alphabetical order by last name or in zip code order. To sort your file, Plus/4 uses the DS (Disk Sort) command. A Plus/4 file can be sorted on up to three fields.

Exercise 6 Sorting

1. Make sure you are in the File Manager and the mailing list diskette is in the disk drive. In this example, we are going to sort the mailing list file on field 2, last name.
2. Press C= C. At F>, type: ds2; RETURN . DS is the Disk Sort command. Up to three fields may be used in a sort. For example, if you wanted to sort the file first by last name (field 2) and then by first name (field 1), you would have entered ds2;1;.

During a sort, Plus/4 uses memory space normally used by the word processor. Make sure you save any word processing documents before sorting.

3. After the file is sorted, a subfile is created. This subfile is used by the Search and Review commands to locate records. You will find that after the file is sorted by last name, the first record displayed in a review is no longer record one. Record 2, which has the last name, Brown, is now the first record displayed during a review. Try searching for records containing "Anytown" and notice the order in which the records are displayed.

Sorting a file is useful if you need to view or print the data in your file in a different order than it was entered. For mailing lists, reports are typically produced in alphabetical order. Mailing labels are usually sorted by zip code.

To produce a printed report of a Plus/4 file requires you to use the Plus/4 Word Processor. There is no map command for the File Manager. Instead, you enter special instructions into the word processor that cause data from the File Manager to be printed.

The next exercise will introduce you to report printing with Plus/4.

Exercise 7 Printing a Report / Listing Your File

1. Make sure the mailing list diskette is in the disk drive.
2. Move to the word processor by typing: C= C tw RETURN .
3. To produce a report or list of your file rquires that you type special instructions in reverse video into the word processor. Then when you print your document, the special instructions tell Plus/4 to use the data in your Plus/4 File Manager. Standard word processing instructions, such as margins, centering, and pagination can also be used when you are listing your file. The report used in this exercise will list each field of each record, vertically down the page. At the top of the page, we will add a centered title.
4. Move the cursor to L = 01 C = 01. Activate reverse video by typing CONTROL 9 . Type: center.
5. Deactivate reverse video by typing CONTROL 0 . Type: Mailing List RETURN .

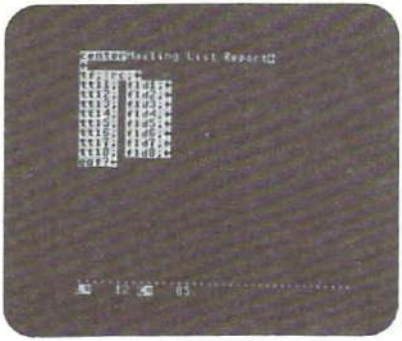
6. To link the File Manager with the word processor requires that you first indicate to the word processor that you want to use data from the File Manager. This is done by typing tf; in reverse video. Move to L=03 C=01 and type in reverse video: tf;. Do not press **RETURN** yet.

7. Next you have to indicate which record to start with. In this example, we will start at the beginning, so type in reverse video: :rc;. (If you wanted to start with another record, you would type the rc instruction with the number of the starting record (rc5;, for example) on a separate line before the tf;:rc;) Tf;:rc; must be typed together on the same line.

8. From this point on, all you do is specify the fields and field names to be printed at the position you want them to print. Field names are specified using ttl (Title) and field data are specified using fld. The record number is specified using #rc. Ttl, fld, and #rc must be typed in reverse video. In our example, we will simply list the field name as shown below:

Multiple fields can appear on the same line as shown in the next exercise. Also, spacing between data and titles is not automatic. It must be inserted by you.

9. Finally, after all the field data is in place, you need to tell Plus/4 to print all the records in the file. EOF? (End of File) is used to increment the record number and check to see if the last record has been reached. The photo below shows a finished report format.



10. When printed, using the *p command, this report format produces the following report:

Mailing List

First Name Thomas
Last Name Brown
Address 1 Apt. 311
Address 2 Park View Apartments
City Anytown
State PA
Zip Code 19000
Telephone 215-123-9876

First Name John
Last Name Smith
Address 1 125 Main Street
Address 2 :
City Anytown
State PA
Zip Code 19000
Telephone 215-123-4567

First Name Paul
Last Name White
Address 1 PO Box 44
Address 2 Evergreen Road
City Smalltown
State PA
Zip Code 19002
Telephone 215-123-5444

First Name Carole
Last Name Williams
Address 1 12 Lantern Lane
Address 2 :
City Anytown
State PA
Zip Code 19000
Telephone 215-123-7780

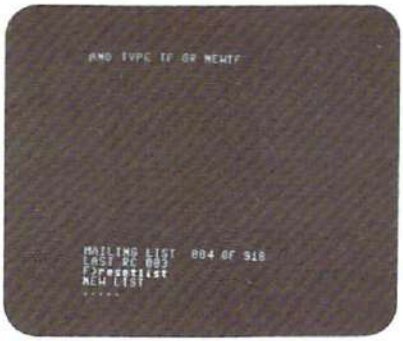
See how each record is printed. The same print format is used for each record. The report is in alphabetical order by last name. The disk sort done in the previous exercise also affects the report.

In addition to listing your file, the word processor can also be used to print labels. In the next exercise, we will first sort the file by zip code and create a format to print labels.

Exercise 8 Labels

1. Make sure the File Manager is displayed on your screen and that the mailing list diskette is in your disk drive.

2. Before we sort the file, we must first delete the existing sort subfile. The Resetlist command is used to delete sort subfiles and restore the data file to its original state. Press C= C and type: **resetlist** RETURN .



   In a few moments, the sort information is deleted and the file is restored to its original state. If you do a review or search, you will see the file is no longer sorted.

3. Next, we want to sort the file by zip code and then by last name, so type: **ds7;2;** RETURN .

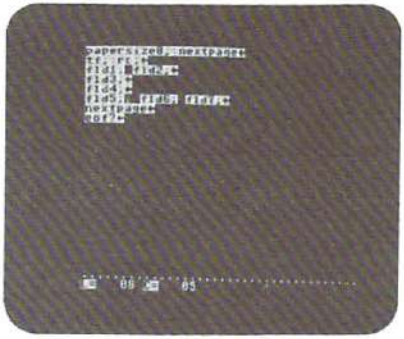
4. Move to the word processor after the sort is done by typing: C= C **tw** RETURN .

5. Labels use essentially the same format as the previous report format. However they use a smaller print area. Keeping this in mind, the first thing we will do to print labels is to specify the paper size. Type the following in reverse video:

   papersize8;:nextpage

You may have to modify the page size depending on the size labels you use. Nextpage is used to make sure the printing for the first label will start at the top of a label.

6. Next, type the field data as shown below:



For labels, we have placed fields 1 (first name) and 2 (last name) on the same line. We have also placed city (field 5), state (field 6, and zip code (field 7) on the same line. A comma has also been inserted between the city and state. Plus/4 allows you to mix text and field information in any way you choose as you will see more clearly in the next exercise.

If you print the document shown above, the result will look like this:

Thomas Brown
Apt. 311
Park View Apartments
Anytown, PA 19000

John Smith
125 Main Street
:
Anytown, PA 19000

Carole Williams
12 Lantern Lane
:
Anytown, PA 19000

Paul White
PO Box 44
Evergreen Road
Smalltown, PA 19002

Don't forget the tf;:rc and the eof?. Without these instructions, the labels won't print properly. You also had to insert two nextpage instructions. Without these instructions, the labels won't print properly. Nextpage causes the next label to start printing at the top of a label.

The final exercise in this lesson shows how to use the Plus/4 word processor and file manager to create form letters. Using the previous examples as a guide, we are going to use our mailing list as the basis for a form letter invitation to a banquet.

Exercise 9 Form Letters

1. Make sure that the word processor is displayed on the screen and that the previous document is deleted.
2. Type in the following letter. ← means press **RETURN**
   R means reverse on. **O** means reverse off.

```
Rlmarg10;:rmarg75;←
tf;:rc;O←
April 3, 1984←
←
←
Rfld1; fld2;←
fld3;←
fld4;←
fld5; fld6; fld7;O←
←
Dear Rfld1;O:←
←
On Saturday, April 14, 1984, the XYZ Computer Club
will be holding its annual banquet. Once again this
year, the banquet will be held at the Enterprise
Restaurant in Anytown. Tickets are $15.00 per
person. Meal choices will include Chicken a la Enter-
prise or Seafood Special. The bar opens at 6:00 P.M.←
←
This year we are pleased to have Dr. Robert Jordan as
our guest speaker. Dr. Jordan is the inventor of the
dual inline joystick. I am sure you will enjoy his
presentation.←
←
```

Make your reservations now, by filling out the enclosed form and sending it to me. I hope to see you all at the biggest social event of the year.←
←
Sincerely yours,←
←
William Jones←
President, XYZ Computer Club←
Rnext page←
eof?**O**←

3. When you are done, your screen should look like this.

Notice how you can mix the field information with the text. When you print this document, a separate letter will be printed to each person in your mailing list. Plus/4 automatically takes care of the horizontal spacing.

Any of the three word processing documents used in this lesson could have been saved like a normal word processing document and reused as required.

The ability to integrate file information with the word processor makes Plus/4 a powerful tool with many applications.

Summary

The DS command is used to sort a file. DS will sort up to three fields. For example, ds2;3; will sort first by field 2 and then by field 3. The resulting sort subfile is used during searches, reviews, or when the File Manager is integrated with the word processor for printing. The RC command is not affected by sorts.

Resetlist is used to cancel a sort subfile and restore a data file to its original unsorted state.

When integrating the File Manager with the word processor for reports, labels, or form letters, the following instructions are used in the word processor. These instructions are typed in reverse video:

tf;:rc—used to tell the word processor to use the file manager for data.

rc;—when used on a separate line preceding tf;:rc;, this instruction can cause a report to start with a record number other than one. For example, rc5;.

#rc—used to print the record number.

ttl—used with a number to specify a field name. For example, ttl1;.

fld—used with a number to specify field data. For example, fld5;.

eof?—used to increment the record counter and to end printing after the last record is printed.

The Plus/4 word processor automatically adjusts the horizontal spacing when these instructions cause data to be inserted into a document.

LESSON 5 SELECTIVE REPORTS

In this lesson you will learn:

- How to use the PI (Pick) command to limit the number of records available for searches or reports.
- How to use the Highrc (High Record) command to limit a search.

In the previous lessons, you saw how searches and sorting were done. With these options, you were searching through or sorting the entire file. Suppose you wanted a report of all people in a certain town or all people with a certain zip code. Or what if you wanted to use only the first 100 records of your file? The commands explained in this lesson are used to limit the number of records used in searches or reports.

In Exercise 10, you will see how to use the PI (Pick) command to produce a subfile of records of people living in a specific town.

Exercise 10 Pick/Highrc

1. Make sure the File Manager is displayed on the screen and the mailing list file diskette is in the disk drive.
2. At F>, type: **resetlist** RETURN to delete any previous sub files.
3. We want to select people who live in Anytown. In our sample file, city is field 5. At F>, type: **pi5;** RETURN We are selecting based on field 5. Do not forget the ;.
4. At BOTTOM:, type: **Anytown** RETURN .
5. At TOP:, type: **Anytown** RETURN .

   The prompts for bottom and top are used to specify a range of data. In this example, the range is one word, Anytown. You can also enter numbers or any letter combinations up to 38 characters. The entries you make for bottom and top are included in Pick. The result of Pick is a subfile that can be used for searches, reviews, sorts, or reports. The subfile only includes records that fall between the ranges specified by the bottom and top.

   During Pick, an ← displayed on the screen indicates a record was found that fit the selection criteria.

The Pick command is powerful and is useful in producing selective reports, labels, or form letter mailings.

The next command to be explained is the Highrc (High Record) command. This command allows you to specify an upper limit for a sort, pick, search, review, or report. The upper limit is a specific record number. For example, highrc100; means any operations (search, sort, etc.) performed after the highrc would stop at record 100. Highrc is usually used before a sort or a select. Resetlist sets the highrc back to the highest record number in the file.

Summary

The **Pi** (Pick) command allows you to select records by alphabetical or numerical range by field. Select affects sorts, searches, reviews, and reports.

The **Highrc** (High Record) command allows you to specify an upper record number for sorts, searches, reviews, picks, or reports.

Resetlist cancels the Pick or Highrc subfiles and restores the file to its original state.

FILE MANAGER SUMMARY

You have now learned how to use the Plus/4 File Manager. The following list summarizes the commands.

Creating a File

NEWTF

This command allows you to enter file specifications including: file name, number of fields, field names, and field lengths. After the file specifications are entered, Plus/4 formats your data diskette and allocates space for your file.

The only data that should be stored on a Plus/4 File Manager diskette are the data records for the file. Spreadsheet and word processing files should not be stored on a Plus/4 File Manager diskette.

File Specifications

17 fields maximum
38 characters per field maximum
999 records per disk maximum

Commands

The following commands are activated by pressing C= C. The commands are listed alphabetically. They are all entered in lower case.

CA—Catalog

This command lists the contents of a diskette and shows how much space is available on it. With the Plus/4 File Manager diskette, no directory entries are shown with this command because Plus/4 uses a special disk allocation scheme.

DS—Disksort

This command is used to sort a file. DS will sort up to 3 levels using three different fields. For example, ds2;3; will sort first by field 2 and then at the next level by field 3. The result of a sort is a subfile that is used during searches, reviews, or when integrating the File Manager with the word processor for printing. Sorting alphabetic fields is straightforward except that punctuation characters and the space are considered as less than the letter A.

Sorting numbers is done as if the numbers were letters in a word. For example, the following sequence of numbers:

42

345

100

would be sorted like this:

100

345

42

If you have a field with numbers and the numbers do not all have the same number of digits, you may need to add leading zeroes as follows to achieve a proper numeric sort:

042

100

345

The RC command is not affected by sorts.

Resetlist will delete a sort subfile and restore a file to its original unsorted state.

Only one sort subfile is active at any time. If a sort subfile already exists and you want to create a new sort subfile, you should use resetlist before doing a sort.

Highrc—High Record

This command allows you to specify an upper record number limit for sorts, searches, reviews, selects, or reports. The number specified by this command becomes a boundary at which the operations described in the last sentence will stop.

For example, highrc100; will cause sorts, searches, reviews, selects, or reports to stop when record 100 is reached regardless of the number of records in the file.

Resetlist sets the highrc back to the maximum file record number.

NR—Next Record

This command will automatically update a record currently displayed on the screen and increment the record counter so that the next record in a file can be entered. This command is useful when you are entering a large amount of data into your file. To use this command, you should first use the TF command to determine the number of the last record

entered. Then you use RC to display that record. From this point on, you can use NR to enter additional records in sequence.

RC—Record

This command has two functions:

1. It can be used to retrieve and display a record by its number.
2. It can be used to enter a record.

   When you use NEWTF to create a new Plus/4 file, a blank file is created. Using the RC command retrieves a specific record regardless of whether the record has any data entered for it or not. After the record is displayed on screen, new data can be entered for the record or the existing data can be modified. Once the data is entered, you can file the record with the NR or UD command.

   To enter data for a particular field, you type the data and press RETURN . To move between fields, you use the cursor up and down keys. Within a field, you can use cursor right or left and insert and delete to edit.

   For example, rc10; will retrieve record 10.

Resetlist

This command deletes sort or select subfiles and sets the highrc back to the maximum number of records in the file. Resetlist does not affect the actual data records. Any time you wish to use sort or select, you should first use Resetlist to restore the file to its original state.

RV—Review

This command is used to display records quickly in your file starting sequentially with the record number you specify. Pressing S will pause the review. Pressing Q will end the review. If a sort of select subfile is present, the review will be based on the subfile.

For example, in an unsorted file, review will simply display the records sequentially by number. If a file has been sorted, then a reveiw will display the records in sorted order. An example is rv1;, which will start the review with the first record in the file.

PI—Pick

This command allows you to create a subfile of records with data that falls within a certain alphabetical or numeric range that you specify. The subfile is used for sorts, searches,

reviews and reports. To create the subfile, you are required to enter a lower and upper limit for a particular field. For example, pi6; will select records for the subfile based on data in field 6. The selection data specified are included in the search. For example, if you select field 5 and enter A as the bottom and B as the top of the range, any records that have field 5 starting with an A or B will be included in the subfile.

Pick uses an exact match. Consequently, it can distinguish between upper and lower case letters.

SR—Search

This command is used to locate records based on the contents of the records. Searching is done on a field-by-field basis. Up to 38 characters of data can be entered for a search. If any field in a record contains the search data, it is considered a match and will be displayed.

For example, if you enter: Car as your search data then any records that have Car anywhere in any field of the record will be matches. Consequently, Carole, Carlos, Oscar, Caroline, and Carr would all match. Searches do not distinguish between upper and lower case letters.

Normally a search starts with record one and examines each record in the file sequentially until the last record is reached. If a sort or a select has been done before the search, the search will use the subfile created by the sort or select and will be in sorted order.

TC—To the Spreadsheet

This command is used to move from the File Manager to the spreadsheet.

TF

This command will display the file name, the number of records available for entry, and the last record number entered.

TW—To the Word Processor

This command is used to move from the File Manager to the word processor.

UD—Update Record

This command is used to file a record displayed on the screen. After RC or NR are used to display a record for entry or editing, UD will file the record. UD can also be used with a record number. For example ud7;. In this case, the record displayed on the screen is filed as record 7.

Producing Reports, Labels, and Form Letters

To produce printed output of your file requires that you use the word processor. The following is a list of the special instructions used in the word processor to link to the File Manager. These instructions must be typed in reverse video.

tf;:rc;

These two instructions are always required at the beginning of a document that is using File Manager data. The RC instruction may also be used with a number (rc5;) to indicate a starting record other than record one.

ttl

This instruction is used with a number (e.g., ttl4; or ttl5;) to indicate a field name. This instruction will cause the indicated field name to be printed wherever the instruction is positioned.

fld

This instruction is used to print field data from a file and is used with a number (e.g., fld1; or fld5;). Wherever this instruction is placed in a document, the indicated field data will be printed.

#rc

Used to print the record number.

eof?

This instruction is used at the end of a document. It causes Plus/4 to check to see if the last record has been printed yet. If the last record has not been printed yet, this instruction causes the word processor to reprint the document using data from the next record in the file. If the last record has been printed, this instruction causes printing to stop.

REFERENCE

This section of the manual provides an alphabetic list of all the commands available with Plus/4 and a brief explanation of each command.

WORD PROCESSOR

The following list summarizes the commands and instructions for the word processor.

Cursor Movement/ Special Keys

the arrow keys move the cursor in the direction indicated.

CLR (SHIFT CLR/HOME)
moves the cursor to the bottom of your text.

Control =
sets a tab.

Control 9
sets reverse video for formatting instructions.

Control 0
deactivates reverse video.

DEL
deletes characters to the left of the cursor.

C= C
activates command mode.

C= R or f2
moves cursor to the right at column 41.

C= L or f1
moves cursor to the left margin.

C= Q
repeat previous keystroke.

C= @
undo an accidental RETURN.

HOME
moves cursor to the top line of your text.

INSERT (SHIFT INST/DEL)

inserts space to the right of the cursor.

RETURN

terminates a line.

SHIFT RETURN

moves cursor to the left margin.

SHIFT =

tab key.

Word Processor Commands

All the commands are initiated by pressing [C] [C] and are entered in lower case.

CA—Catalog

lists the contents of a diskette and shows how much space is available on the disk in blocks. 1 block equals 254 characters.

CB—Create a Block

used to identify a block of text (up to 16 lines) that can be inserted somewhere else in your document with the IB command. This block is stored in a buffer that remains in memory until a new block is created or your computer is turned off.

CM—Clear Memory

used to erase or delete a document currently in memory.

CP—Clear Pointers

used to erase pointers set with the SP command.

CT—Clear Tabs

DB—Delete Block

deletes text from the current cursor position down to the next pointer. Pointers are set with the SP command.

DF—Delete File

deletes a disk file permanently.

DL—Delete a line of text

EP—Erase Pointer

removes a pointer set with the SP command.

IB—Insert a Block

inserts a block of text created with the CB command at the current cursor position. If there is not enough space in the document for the block, the block will not be inserted.

ID—Initialize Disk

used when loading a file from one diskette and saving the file on a new diskette. ID should be done just before the save.

IL—Insert a line of text

LF—Load a File

clears memory and loads a file from disk into memory. Once loaded the file can be edited or printed. Load file can also use the wild card load. For example, typing let* as the filename will load the first file in the catalog that has let as the first three letters. See our disk manual for more information.

MF—Merge File

takes a document file saved on disk and appends it to the document currently in memory.

PR—Print Document

saves the document currently in memory on disk with the name "..tw" then allows you to load any document and print it. This command must be used with linked files.

RE—Search and Replace words or phrases

SF—Save File

saves document currently in memory onto a diskette.

SP—Set Pointer

sets a pointer at the current line. Pointers are used to create blocks, delete blocks and to keep the entire document from shifting during insertions and deletions.

SR—Search for a word or phrase

***P**—Print document in memory.

Document Formatting Instructions

These instructions are only executed when a document is printed. They are embedded in the text in reverse video and are typed in lowercase. The : is used to separate multiple instructions on the same line. The ; terminates the instruction.

Asc

will send an ASCII character to the printer. ASCII characters are used for enhanced or bold text.

Center

will center text on the same line as the command. To center enhanced characters created by the ASC command, you need to put the ASC and center instruction on the same line. For example: asc14;:center.

Justify

causes text to be right justified.

Linkfile

used to link documents at print time. The linked document will be loaded and printed automatically without operator intervention. To use linkfile, you must use the pr command when printing. Example: linkfile "letter."

Lmarg

sets the left margin. Example: lmarg10;

Nextpage

forces a new page.

NoJustify

returns printing to normal ragged right margins.

Nowrap

turns off word wrap. Used for printing spreadsheets.

No#page

deactivates the #Page command.

Other

used with non Commodore printers to reverse the character set to standard ASCII.

Pagelen

modifies the number of lines printed on a page. The default is 60 lines. Example: pagelen55;

Pagepause

causes printing to stop at the end of every page.

Papersize

modifies the size of the paper used. The default is 66 lines (11 inches). Example: pagesize50;. When you modify the paper size, you should also modify the page length.

Pause

causes printing to stop until you press RETURN.

Rmarg

sets the right margin. Example: rmarg75;

Set#pg

sets the page number. This is used in conjunction with the #Page instruction. Example: Set#pg4;

#Page

causes the page number to be printed at the bottom of the page.

Wrapon

Turns word wrap on. Wrapon is the default setting. When mapping spreadsheet data into the word processor, remember if there is a character in column 77 of one line and another character in column 1 of the next line, the word processor will consider these characters part of the same word. To avoid problems with mapped spreadsheet data, either turn word wrap off using the nowrap instruction or add carriage returns at the end of each mapped line.

Formatting Defaults

The following formatting defaults are in effect if no formatting instructions are used in your document:

Left Margin—0

Right Margin—77

Pagelength—60 lines

Papersize—66 lines

Justify Off

Wrap on

SPREADSHEET

The following list summarizes the spreadsheet commands.

Cursor Movement/ Special Keys

Between cells:

↓—moves the cursor down

↑—moves the cursor up

C= R—or f2 moves the cursor right

C= L—or f1 moves the cursor left

Within a cell:

cursor right, cursor left, insert, delete

Commands

All the commands are activated by pressing C= C. The commands are listed alphabetically. Commands with a * were not explained in the self-teaching guide. Commands are entered in lower case.

Auto—Automatic Calculation

causes calculations to be performed automatically by row, starting with row one.

Blkmap—Block Map

transfers a block of data from the spreadsheet to the word processor. First, you position the cursor at the point in the word processing document where you want the data transferred. Then you move back to the spreadsheet and position the cursor in the upper left corner of the block of data you want to transfer. You then specify the cell that corresponds to the lower right corner of the data to be transferred. Seven columns and 50 rows of data maximum can be transferred at one time. For example, Blkmap6;6 with the cursor in cell 1;1 will transfer 1;1 through 1;6, 1;2 through 6;2, 1;3 through 6;3, 1;4 through 6;4, 1;5 through 6;5, and 1;6 through 6;6. Only 11 characters per cell will be transferred. Once data is transferred to the word processor, it can be printed.

After data is mapped, it is treated like normal text. In some instances, it will be necessary to add carriage returns to the end of the mapped lines so that the mapped data prints properly. Also, you may want to add a nowrap instruction to your document just before the mapped data if you have a document that uses the default margins and you have mapped seven columns. Nowrap maintains the integrity of the columns.

If you try to transfer more than seven columns of data, the extra columns will wrap around in your text and cause unpredictable results. Also, blkmap will write over existing text in the word processor.

Ca—Catalog

lists the contents of a diskette and shows how much space is available on the diskette. Spreadsheet files have a ".c" in the title. After the catalog listing, the screen is put into full screen mode.

Cco—Column Copy

copies a column to the current column. If data is in the column, it will be overwritten. Copied formulas are not adjusted. For example: cco1; will copy column 1 to the current column.

Cdel—Column Delete

deletes the current column. If a column delete causes columns to shift to the left, then formulas in the shifted columns may need to be reentered to reflect the shift.

Cins—Column Insert

causes a new column to be inserted. If a column insert causes any columns to shift to the right, then the formulas in the shifted columns may need to be reentered to reflect the shift.

CM—Clear Memory

used to delete a spreadsheet from memory.

Color

causes the screen background color to change according to the following table. For example, color0; changes the background to black.

Number	Color
0	Black
1	Gray
2	Red
3	Cyan
4	Purple
5	Green
6	Blue
7	Yellow
8	Orange
9	Brown
10	Yellow Green
11	Light Red
12	Blue Green
13	Light Blue
14	Dark Blue
15	Light Green

Copy

used to copy any cell to the current cell. For example, copy6;5 will copy cell 6;5 to the current cell. Formulas are not adjusted with this command.

DF—Delete File

deletes a disk file permanently.

Fit

used to copy a formula from any cell to the current cell. The row and column numbers in the formula will be adjusted based on the distance the current cell is from the copied cell. For example, if cell 2;3 has the formula 2;1 + 2;2 and the cursor is in 3;3, if you fit 2;3 the resulting formula in 3;3 will be: 3;1 + 3;2.

Fl—Floating Point

used to put numbers into floating point format. Floating point is the default mode for the Plus/4 spreadsheet.

***Format**—Format a Disk

this command will format a data disk for use with Plus/4. With the Format command, you need to enter a title and a disk id, separated by a comma. For example Plus/4 disk,01. The title may be up to 16 characters in length; ids must be two characters. For more information, see Appendix A.

***Fre**—Freeze a Cell

This command will lock in the value of a cell. A frozen cell cannot be changed in any way until the cell is unfrozen with the Thaw command. An asterisk is displayed on the status line when a cell is frozen. Frozen cells are also not shifted during row or column insertions or deletions. When a cell is frozen, it cannot be moved. The Freeze command is useful if you want to be absolutely certain that, no matter how much you modify your spreadsheet, the frozen cell or cells will not be changed in any way.

Fu—Full Screen

used to put the screen into full screen display mode. In full screen mode, the word processor can display 22 lines or the spreadsheet can display 12 rows. This command can be used in either the spreadsheet or the word processor.

Goto

will move the cell cursor to the cell specified. For example, goto6;12 will move the cursor to cell 6;12.

Ha—Half Screen

used to split the screen for windowing. In half screen mode, a spreadsheet and a word processing document can be displayed on the screen simultaneously. In this mode, seven rows of the spreadsheet and 12 lines of the word processor can be displayed. This command can be accessed in both the word processor and the spreadsheet.

Home

used to move the cursor to cell 1;1.

***Id**—Initialize Disk

used when loading a file from one diskette and saving that file on another diskette. The id command should be executed just before the save.

In—Integer Format

used to display numbers as integers.

Leftj—Left Justify

used to left justify numbers in a cell.

Lf—Load File

loads a file from disk into memory.

Man—Manual Calculation

in this mode, a formula is only calculated when you enter the cell and press RETURN. Manual is the default calculation mode for Plus/4.

Map

used to transfer data from the spreadsheet to the word processor. With the Map command, the data is transferred manually, row by row. Before the transfer, you must position the cursor in the word processing document at the point where you want the data to be transferred. Then you move to the spreadsheet and use C= R, C= L, and cursor down to move from cell to cell, by row, and transfer the data. The Map command is easiest to use when the spreadsheet and word processor are both displayed on the screen. With the Map command, all 36 characters of a text or formula cell are transferred. Map or Blkmap must be used to print a spreadsheet.

Off—Map Off

turns off the Map command.

Rco—Row Copy

copies a row to the current row. If data is in the current row, it will be overwritten during a row copy. Formulas are not adjusted during a row copy. For example, rco3; will copy row 3 to the current row.

Rdel—Row Delete

deletes the current row. If a row delete causes rows to shift up, then any formulas in the shifted rows may need to be reentered to reflect the shift.

***Reset**

clears all memory, erases any data and starts Plus/4 over again. This can also be accomplished by pressing the Reset button.

***Rightj**—Right Justify

causes numbers to be right justified in a cell. This is the default mode.

Rins—Row Insert

causes a new row to be inserted. If a row insert causes any rows to be shifted down, then the formulas in the shifted rows may need to be reentered to reflect the shift.

Sf—Save File

saves the spreadsheet currently in memory to disk.

***Thaw**

used to cancel a freeze of a cell.

Tw—To the Word Processor

used to move from the spreadsheet to the word processor. In half screen mode, both the spreadsheet and the word processor are displayed on the screen simultaneously when this command is executed.

$$—Dollar Format

used to display numbers to two decimal places, e.g., 65.75 or 198.27

C= q

repeats the previous command. This command does not require **C= C** to be typed first. **C= q** works differently in the spreadsheet than it does in the word processor. In the spreadsheet, **C= q** repeats a command. In the word processor, **C= q** repeats the last keystroke. The word processor is character oriented and the spreadsheet is command oriented.

Command Defaults

When you initially enter the spreadsheet, the following command defaults are in effect:

Floating Point Format

Full Screen Display

Right Justified Numbers

Map Off

Manual Calculations

Color 0;

Formulas/ Data Entry

A Plus/4 cell can contain numbers, text, formulas, numbers and text, or numbers and formula. The default mode of data entry is numeric.

To enter text, press **C= T**.

To enter formulas, press **C= F**.

To enter numbers after text, press **C= N**.

The data entry mode is displayed on the status line.

Formulas are evaluated from left to right. One level of parentheses can be added to a formula to change the order of evaluation. A cell used in a formula must be in r;c format, where r is the row number and c is the column number of the cell. For example, 3;6 refers to the cell at row 3, column 6. A formula can have a maximum of 36 characters.

Numeric constants used in formulas must be prefixed by a #. For example, #100 or #0. Numeric constants may be no larger than five characters. In integer mode, this is 99999. In dollar mode, this is 99.99. If this poses a problem, place the numeric constant in a cell outside the spreadsheet and use the cell reference in the formula.

Text labels may also be used in formulas if they are enclosed in brackets. For example, [sales]. Any cell that does not contain a formula can have a text label. Text labels are entered as normal text. Text labels can be a maximum of 36 characters.

The following commands are valid in formulas. Commands with a * were not explained in the self-teaching guide.

Arithmetic Operators

+ Addition

– Subtraction

* Multiplication

/ Division

↑ Exponentiation

The following commands may be used by themselves or combined with any of the arithmetic operators.

***ABS**—Absolute value

Examples: abs3;5 abs# – 100

***ATN**—Arctangent in radians

Examples: atn6;9 atn#.5

***COS**—Cosine in radians

Examples: cos4;10 cos#.25

***DIV**—Division

This command is used to divide a row or column of numbers in a series.

Example: div1;1to4;1 will divide 2;1 by 1;1. 3;1 will then be divided by the result. 4;1 will then be divided by the second result.

***EXP**—Exponent

This command calculates the constant e (2.71828183) raised to the power given.

Examples: exp#3;4 exp#50

***LOG**—Logarithm

Example: log6;5 log#40

***MAX**—Maximum

This command will compute the largest number in a row or column.

Example: max 5;1 to 5;6

***MIN**—Minimum

This command will compute the smallest number in a row or column.

Example: min2;1 to 6;1

***MLT**—Multiply

This command will multiply a series of numbers in a row or column.

Example: mlt1;2 to 3;2

***SIN**—Sine in radians

Examples: sin6;12 sin#1

***SUB**—Subtraction

This command will subtract a series of numbers in a row or column.

Example: sub1;1 to 3;1 will subtract 1;1 from 2;1. The resulting answer will be subtracted from 3;1.

SUM—Sum

This command will add a series of numbers in a row or column.

Example: sum 4;5 to 4;12

***TAN**—Tangent in radians

Examples: tan18;6 tan#.5

Transfer

used to put the contents of one cell into another cell. For example 1;1←6;5 will put the value in 6;5 into cell 1;1.

IFTRUE

Iftrue is used to evaluate an expression and then, based on whether the expression is true or false, will place a value into another cell. Iftrue can be used to modify the normal order of calculation. Normally, a Plus/4 spreadsheet in automatic mode will calculate formulas row by row, starting with row 1. Iftrue allows you to calculate a value in a higher row and then put this value into a lower row.

Iftrue can use the following operators:

Operator	Meaning
=	Equal to
>	Greater than
<	Less than
nte	Not Equal to
not	Not true
←	Indicates the cell affected by the outcome of the iftrue.

An iftrue formula has three parts:

1. An expression using any valid Plus/4 formula, cell, or numeric constant and any of the operators. For example:

   3;1<#10

   4;2=5;2

   3;1+6;2nte#100

2. Iftrue or notiftrue

3. Cell ← Expression. The value of the expression will be transferred to the cell indicated if the expression preceding the iftrue or notiftrue evaluates true or false. For example:

   16;5<#200iftrue8;3←16;5

   translates into:

   If the value in 16;5 is less than 200, then put the value of 16;5 into cell 8;3.

   19;1+20;1=#0notiftrue5;4←20;1

   translates into:

   If 19;1 + 20;1 is not equal to 0 then transfer 20;1 into 5;4

FILE MANAGER SUMMARY

The following list summarizes the commands used in the File Manager and in the word processor when it is being used with the File Manager.

Creating a File

NEWTF

This command allows you to enter file specifications including: file name, number of fields, field names and field lengths. After the file specifications are entered, Plus/4 formats your data diskette and allocates space for your file.

The only data that should be stored on a Plus/4 File Manager diskette are the data records for the file. Spreadsheet and word processing files should not be stored on a Plus/4 File Manager diskette.

File Specifications

17 fields maximum
38 characters per field maximum
999 records per disk maximum

Commands

The following commands are activated by pressing C= C. The commands are listed alphabetically.

CA—Catalog

This command lists the contents of a diskette and shows how much space is available on the diskette. With the Plus/4 File Manager diskette, no directory entries are shown with this command because Plus/4 uses a special disk allocation scheme.

DS—Disksort

This command is used to sort a file. DS will sort up to 3 levels using three different fields. For example, ds2;3; will sort first by field 2 and then at the next level by field 3. The result of a sort is a subfile that is used during searches, reviews, or when integrating the File Manager with the word processor for printing. Sorting alphabetic fields is straightforward except that punctuation characters and the space are considered as less than the letter A.

Sorting numbers is done as if the numbers were letters in a word. For example, the following sequence of numbers:

42

345

100

would be sorted like this:

100

345

42

If you have a field with numbers and the numbers do not all have the same number of digits, you may need to add leading zeroes as follows to achieve a proper numeric sort:

042

100

345

The RC command is not affected by sorts.

Resetlist will delete a sort subfile and restore a file to its original unsorted state.

Only one sort subfile is active at any time. If a sort subfile already exists and you want to create a new sort subfile, you should use resetlist before doing a sort. If you are sorting two-digit fields and single digit fields together, the single-digit fields must be in a two-digit format. For example, ds05;ds13;. Once a sort has started, you can abort the sort by pressing and holding q. Pressing s pauses the sort. If you abort a sort use resetlist to restore the file to its original unsorted state.

Highrc—High Record

This command allows you to specify an upper record number limit for sorts, searches, reviews, selects, or reports. The number specified by this command becomes a boundary at which the operations described in the last sentence will stop.

For example, highrc100; will cause sorts, searches, reviews, selects, or reports to stop when record 100 is reached regardless of the number of records in the file.

Resetlist sets the highrc back to the maximum file record number.

NR—Next Record

This command will automatically update a record currently displayed on the screen and increment the record counter so that the next record in a file can be entered. This command is useful when you are entering a large amount of

data into your file. To use this command, you should first use the TF command to determine the number of the last record entered. Then you use RC to display that record. From this point on, you can use NR to enter additional records in sequence.

RC—Record

This command has two functions:

1. It can be used to retrieve and display a record by its number.
2. It can be used to enter a record.

   When you use NEWTF to create a new Plus/4 file, a blank file is created. Using the RC command retrieves a specific record regardless of whether the record has any data entered for it or not. After the record is displayed on screen, new data can be entered for the record or the existing data can be modified. Once the data is entered, you can file the record with the NR or UD command.

   To enter data for a particular field, you type the data and press RETURN. To move between fields, you use the cursor up and down keys. Within a field, you can use cursor right or left and insert and delete to edit.

   For example, rc10; will retrieve record 10.

Resetlist

This command deletes sort or select subfiles and sets the highrc back to the maximum number of records in the file. Resetlist does not affect the actual data records. Any time you wish to use sort or select, you should first use Resetlist to restore the file to its original state.

RV—Review

This command is used to quickly display records quickly in your file sequentially starting with the record number you specify. Pressing S will pause the review. Pressing Q will end the review. Pressing the space speeds up the display. If a sort of select subfile is present, the review will be based on the subfile.

For example, in an unsorted file, review will simply display the records sequentially by number. If a file has been sorted, then a review will display the records in sorted order. An example is rv;1, which will start the review with the first record in the file.

PI—Pick

This command allows you to create a subfile of records with data that falls within a certain alphabetical or numeric range that you specify. The subfile is used for sorts, searches, reviews, and reports. To create the subfile, you are required to enter a lower and upper limit for a particular field. For example, se6; will select records for the subfile based on data in field 6. The selection data specified are included in the search. For example, if you select field 5 and enter A as the bottom and B as the top of the range, any records that have field 5 starting with an A or B will be included in the subfile.

Pick uses an exact match. Consequently, it can distinguish between upper and lower case letters.

SR—Search

This command is used to locate records based on the contents of the records. Searching is done on a field by field basis. Up to 38 characters of data can be entered for a search. If any field in a record contains the search data, it is considered a match and will be displayed.

For example, if you enter: Car as your search data, then any records that have Car anywhere in any field of the record will be matches. Consequently, Carole, Carlos, Oscar, Caroline, and Carr would all match. Searches do not distinguish between upper and lower case letters.

Normally a search starts with record one and examines each record in the file sequentially until the last record is reached. If a sort or a select has been done before the search, the search will use the subfile created by the sort or select and will be in sorted order.

TC—To the Spreadsheet

This command is used to move from the File Manager to the spreadsheet.

TF

This command will display the file name, the number of records available for entry, and the last record number entered. The top line of the status display shows the number of records in the currently active subfile. The last RC on the second line is the last record updated.

TW—To the Word Processor

This command is used to move from the File Manager to the word processor.

Update Record

This command is used to file a record displayed on the screen. After RC or NR are used to display a record for entry or editing, UD will file the record. UD can also be used with a record number. For example ud7;. In this case, the record displayed on the screen is filed as record 7.

Producing Reports, Labels and Form Letters

To produce printed output of your file requires that you use the word processor. The following is a list of the special instructions used in the word processor to link to the File Manager. These instructions must be typed in reverse video.

tf;:rc;

These two instructions are always required at the beginning of a document that is using File Manager data.

rc;

If this instruction is placed on its own line before tf;:rc;, you can cause the printed output to start with a specific record. For example rc5; will start with record 5.

ttl

This instruction is used with a number (e.g., ttl4; or ttl5;) to indicate a field name. This instruction will cause the indicated field name to be printed wherever the instruction is positioned.

fld

This instruction is used to print field data from a file and is used with a number (e.g., fld1; or fld5;). Wherever this instruction is placed in a document, the indicated field data will be printed. If the field is blank a : will be printed in the text.

#rc

Used to print the record number.

eof?

This instruction is used at the end of a document. It causes Plus/4 to check to see if the last record has been printed yet. If the last record has not been printed yet, this instruction causes the word processor to reprint the document using data from the next record in the file. If the last record has been printed, this instruction causes printing to stop.

APPENDIX A
DISKETTE FORMATTING AND DISKETTE PRECAUTIONS

Formatting a Diskette

A diskette may be formatted from within the Plus/4 program as follows:

1. Activate Plus/4 by pressing the f1 key and pressing RETURN .
2. Hold down the C= key and press C.
3. At W>, type: tc RETURN .
4. At C>, hold down the C= key and press C.
5. At C>, type format RETURN . Insert a blank diskette into the disk drive. Formatting a diskette erases any previous information on the diskette so be careful.
6. At ARE YOU SURE Y/N, press Y to continue. Press N to stop.
7. At DISK, ID, enter a name for your diskette (up to 16 characters), a comma, and a 2-character identifier, and press RETURN . For example, you could enter: Plus/4 disk,31.
8. Plus/4 will then format your diskette for use.
9. To return to the word processor, hold down the C= key and press C. At C>, type: tw RETURN .

Disk Precautions

Diskettes must be handled with care. The following rules must be obeyed in order to protect the information stored on your diskettes:

1. Keep the diskette in its storage envelope whenever it is not in the disk drive.
2. Store the diskette in a diskette library case or other suitable rigid container.
3. Never leave the diskette on top of the disk drive.
4. Keep diskettes away from magnets and magnetic fields, such as those generated by transformers, electronic motors, loudspeakers, and telephones.
5. Do not write on the diskette jacket or label with a lead pencil or ballpoint pen. Use a felt tip pen or fill out the label before attaching it to the diskette.
6. Do not expose diskettes to excessive heat or sunlight. The recommended temperature range for the storage and use of diskettes is 50 to 120 degrees F.
7. Do not touch the diskette surface or center hole. Hold the diskette only on the encased area.
8. Do not attempt to clean the diskette. Abrasion will result in the loss of stored information.
9. Do not turn the disk drive on or off while the diskette is in place.
10. Gently load the diskette into the disk drive. Rough handling or forcing may damage the center hole.
11. Never remove the diskette from the disk drive while the disk unit is whirring.
12. Never bend the diskette. Always keep it flat.
13. Do not attach notes to the diskette with a paper clip or staples.
14. **NOTE:** Because of limitations of cassette hardware, your Commodore Plus/4 integrated software will not work with the Commodore Datassette.

APPENDIX B EXAMPLE APPLICATIONS Spreadsheet Examples

Home Budget

	C1	C2	C3	C4	C5
R1			HOME BUDGET		
R2		January		February	
R3		Budget	Actual	Budget	Actual
R4					
R5	Income				
R6	Salaries	1600.00	1600.00	1600.00	1600.00
R7	Other			1000.00	1000.00
R8					
R9	Total Inc	6.2+7.2	6.3+7.3	6.4+7.4	6.5+7.5
R10					
R11	Expenses				
R12	Rent	500.00	500.00	500.00	500.00
R13	Electric	100.00	125.00	100.00	100.00
R14	Auto	40.00	40.00	50.00	65.00
R15	Food	200.00	195.00	200.00	210.00
R16	Clothing	0.00	15.00	0.00	0.00
R17	Insurance	200.00	175.00	0.00	0.00
R18	Entertain	40.00	20.00	40.00	10.00
R19	Miscell	150.00	130.00	150.00	175.00
R20					
R21	Total Exp	sum12.2to19.2	sum12.3to19.3	sum12.4to19.4	sum12.5to19.5
R22					
R23	Difference	9.2-21.2	9.3-21.3	9.4-21.4	9.5-21.5

This home budget can be expanded to cover as many months as you need.

First the formulas for 9;2, 21;2, and 23;2 were entered. The remaining formulas in row 9 were created using Fit 9;2 and C= q. The remaining formulas in row 21 were created using Fit 21;2 and C= q. The remaining formulas in row 23 were created using Fit 23;2 and C= q. The underlines were done with the copy command.

You can modify this spreadsheet to include our own categories. However, you will have to adjust the formulas.

P&L Statement

	C1	C2	C3	C4	C5
R1					
R2		Profit and Loss by Month for The ABC Company			
R3					
R4		January	February	March	April
R5					
R6	Sales	500000	600000	720000	864000
R7	Cost of Goods				
R8	Material	75000	90000	108000	129600
R9	Labor	20000	20000	20000	20000
R10	Shipping	15000	18000	21600	25920
R11					
R12	Total	sum8.2to10.2	sum8.3to10.3	sum8.4to10.4	sum8.5to10.5
R13					
R14	Gross Prof	6.2-12.2	6.3-12.3	6.4-12.4	6.5-12.5
R15					
R16	G & A				
R17	Salaries	120000	120000	120000	120000
R18	Rent	4000	4000	4000	4000
R19	Phone	1000	1000	1000	1000
R20	Advert	2000	2000	2000	2000
R21	Misc	11700	14160	17112	20654
R22					
R23	Total	sum17.2to21.2	sum17.3to21.3	sum17.4to21.4	sum17.5to21.5
R24					
R25	Net Profit	14.2-23.2	14.3-23.3	14.4-23.4	14.5-23.5
R26					

Formulas were entered into 12;1, 14;2, 23;2, and 25;2.

All the formulas in rows 12, 14, 23, and 25 were created using fit and C= q.

Calorie Counter

This spreadsheet will calculate calorie usage based on weight. The numbers computed here are not absolute. Values for various exercises vary greatly based on a number of factors such as age, sex, body composition, body condition, temperature and actual intensity of the exercise.

The data for this spreadsheet is provided in the table below.

Row/Column	Data for the cell
1;1	Calorie Cal
3;1	Weight
5;1	Calories
7;1	Activity
8;1	_____
9;1	Archery
10;1	Badminton
11;1	Basketball
12;1	Biking 5 mph
13;1	Biking 9 mph
14;1	Bike Race
15;1	Billiards
16;1	Boxing Match
17;1	Boxing-Sparring
18;1	Canoeing
19;1	Card Play
20;1	Carpentry
21;1	Chop Wood
22;1	Cleaning
23;1	Cooking
24;1	Croquet
25;1	Dance-Fast
26;1	Dance-Slow
27;1	Desk Work
28;1	Dig Ditch
29;1	Dish Washing
30;1	Drawing
31;1	Dressing
32;1	Driving
33;1	Eating
34;1	Exer. Light
35;1	Exer. Med
36;1	Exer. Heavy
37;1	Exer. Strenuous
38;1	Fishing
39;1	Football
40;1	Garden-Digging

Row/Column	Data for the cell
41;1	Garden-Planting
42;1	Golf
43;1	Hill Climbing
44;1	Hockey
45;1	Horseriding
46;1	Ironing
47;1	Judo
48;1	Knitting
49;1	———

Note: Use copy and edit for all the formulas in column 2. Copy 9;2 and then edit the values.

1;2	culator
3;2	wt
5;2	cal
7;2	Cal/Min.
8;2	———
9;2	#.065*[adjwt]
10;2	#.097*[adjwt]
11;2	#.138*[adjwt]
12;2	#.064*[adjwt]
13;2	#.100*[adjwt]
14;2	#.169*[adjwt]
15;2	#.042*[adjwt]
16;2	#.222*[adjwt]
17;2	#.138*[adjwt]
18;2	#.044*[adjwt]
19;2	#.025*[adjwt]
20;2	#.052*[adjwt]
21;2	#.297*[adjwt]
22;2	#.045*[adjwt]
23;2	#.048*[adjwt]
24;2	#.059*[adjwt]
25;2	#.168*[adjwt]
26;2	#.051*[adjwt]
27;2	#.025*[adjwt]
28;2	#.145*[adjwt]
29;2	#.049*[adjwt]
30;2	#.036*[adjwt]
31;2	#.049*[adjwt]
32;2	#.033*[adjwt]
33;2	#.023*[adjwt]
34;2	#.053*[adjwt]
35;2	#.095*[adjwt]
36;2	#.133*[adjwt]
37;2	#.180*[adjwt]

38;2	#.062∗[adjwt]
39;2	#.132∗[adjwt]
40;2	#.126∗[adjwt]
41;2	#.070∗[adjwt]
42;2	#.085∗[adjwt]
43;2	#.121∗[adjwt]
44;2	#.134∗[adjwt]
45;2	#.110∗[adjwt]
46;2	#.057∗[adjwt]
47;2	#.195∗[adjwt]
48;2	#.023∗[adjwt]
49;2	_____
7;3	Minutes
8;3	_____
50;3	sum9;3to48;3
3;4	[wt]∗#2.2
7;4	Total
8;4	_____
9;4	9;2∗9;3
10;4-48;4	Use fit 9;4 for 10;4. Then use [redacted] for the rest of the row.
50;4	sum9;4to48;4
3;5	3;4>#0iftrue[adjwt]←3;4
7;5	Activity
8;5	_____
9;5	Lathe Use
10;5	Lay Still
11;5	Mopping
12;5	Mow Lawn
13;5	Paint House
14;5	Ping Pong
15;5	Play Piano
16;5	Racquetball
17;5	Rake Leaves
18;5	Run 5mph
19;5	Run 6mph
20;5	Run 7mph
21;5	Run 10mph
22;5	Saw by Hand
23;5	Saw/Power
24;5	Sewing
25;5	Shopping
26;5	Sitting
27;5	Skiing
28;5	Standing
29;5	Swim-Crawl
30;5	Tennis
31;5	Typing
32;5	Vacuuming
33;5	Volleyball

34;5	Walk—3mph
35;5	Walk—4mph
36;5	Walk—5mph
37;5	Weeding
38;5	Weightlifting
39;5	Welding
40;5	Writing
49;5	_____
3;6	adjwt
7;6	Cal/Min.
8;6	_____
9;6	#.052*[adjwt]

For the remainder of the column, first copy 9;6 and use [redacted] to duplicate this cell down the column. Then edit the cells for the correct values.

10;6	#.020*[adjwt]
11;6	#.060*[adjwt]
12;6	#.112*[adjwt]
13;6	#.077*[adjwt]
14;6	#.068*[adjwt]
15;6	#.040*[adjwt]
16;6	#.212*[adjwt]
17;6	#.054*[adjwt]
18;6	#.135*[adjwt]
19;6	#.165*[adjwt]
20;6	#.200*[adjwt]
21;6	#.252*[adjwt]
22;6	#.122*[adjwt]
23;6	#.075*[adjwt]
24;6	#.025*[adjwt]
25;6	#.062*[adjwt]
26;6	#.021*[adjwt]
27;6	#.114*[adjwt]
28;6	#.027*[adjwt]
29;6	#.128*[adjwt]
30;6	#.109*[adjwt]
31;6	#.029*[adjwt]
32;6	#.048*[adjwt]
33;6	#.050*[adjwt]
34;6	#.072*[adjwt]
35;6	#.097*[adjwt]
36;6	#.127*[adjwt]
37;6	#.072*[adjwt]
38;6	#.185*[adjwt]
39;6	#.052*[adjwt]
40;6	#.025*[adjwt]

49;6	
7;7	Minutes
8;7	
50;7	sum9;7 to 48;7
7;8	Total
8;8	
9;8	9;6*9;7
10;8-40;8	First fit 9;8 for 10;8. Then use [C=] [g] for the rest of the row.
49;8	
50;8	sum9;8 to 48;8
50;9	50;4+50;8
50;10	50;9>#0iftrue[call]←50;9

This spreadsheet uses the labels wt, adjwt, and cal in the formulas. It also uses iftrue to display the answer. Cell 50;10 is the cell that calculates the answer.

To use this spreadsheet after it is typed in, enter your weight in pounds at cell 3;2. Then enter the minutes spent on each activity in columns 3 and 7. Use auto mode to calculate the answer.

The weight you enter is converted to kilograms. Your weight in kilograms, adjwt, is used to calculate the calories per minute for each activity. When you enter the minutes, they are multiplied by the calories/minute to find the total calories for the activity. These totals are all added together to get the answer.

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Using the Commodore® Plus/4 Integrated Software

The Commodore Plus/4's built-in software packages are available at the press of a function key. These four software packages make the Plus/4 "the productivity machine", versatile and practical for both small business and home use.

This User's Manual explains in an easy-to-follow tutorial style how to use the Plus/4's built-in software packages:

- Word Processor
- Spreadsheet
- File manager
- Graphics

You can use each package separately or together, since the four built-in packages are INTEGRATED. This means you can share information between packages; for example take figures from the spreadsheet and include them in a wordprocessor letter. This manual explains how this integration between the software works with examples that you can follow step-by-step.

commodore COMPUTERS

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