

THE ELECTRONIC SPREADSHEET PROGRAM

for use with

MANAGERIAL ACCOUNTING

Seventh Edition

**Ray H. Garrison
Eric W. Noreen**

Prepared by
John W. Wanlass

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Irwin/McGraw-Hill

A Division of The McGraw-Hill Companies

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Printed in the United States of America.

ISBN 0-256-14975-5 (5.25" version)

ISBN 0-256-14974-7 (3.5" version)

3 4 5 6 7 8 9 0 EB 1 0 9 8 7 6

Preface

The **Electronic Spreadsheet Program**, is organized and designed to accompany Managerial Accounting, by Ray H. Garrison and Eric W. Noreen, Seventh Edition. Because each problem is fully described and contained in the ESP manual, the manual can be used with most managerial accounting textbooks. The manual uses Lotus 1-2-3, a popular electronic spreadsheet program, to solve selected managerial accounting problems.

Historically computers have been introduced toward the end of the accounting program but the microcomputer is rapidly changing the accounting environment. Most businesses, large or small, turn to the computer to process business transactions and to analyze business problems. In today's business world, computer literacy is required and will greatly magnify your employment opportunities.

Objectives of the Electronic Spreadsheet Program

In the accounting classroom, accounting problems are usually organized and solved manually. In today's business world, problems are organized and solved electronically, often using electronic spreadsheet programs. These computing skills are necessary to be competitive in the job market. This manual was designed to reinforce accounting principles by comparing and contrasting **manual** problem solving with **electronic** problem solving while developing working computer skills.

The Manual Worksheet



The Electronic Spreadsheet

	A	B	C	D
1				
2				
3				
4				

Only problems that are understood manually can be solved electronically. In other words, to successfully create an electronic spreadsheet you must first understand the problem's relationships. This manual was designed to reinforce the underlying relationships by first solving a sample case manually, then organizing and processing the problem electronically.

You will begin by learning electronic spreadsheets from the viewpoint of the spreadsheet user. You will also learn to design and program electronic spreadsheets which can then be used by others. The roles of the **user** and the **programmer** are shown below.

The Spreadsheet User


Prepare the data inputs.
Process the data electronically.
Process and analyze the reports.

The Spreadsheet Programmer

Define the problem's relationships.
Organize and create the electronic spreadsheet.
Produce and analyze the results.

How to Use This Manual

Please use this manual as a workbook. Write directly on the forms provided in each chapter. The following conventions have been used throughout the manual.

- ☐ This **box** indicates a step to be completed by you. When you see this box please complete the required action. You may want to place a check in the box to indicate its completion.
-  The **hand** is used to point to an important idea; something you should try to remember.
- []** The **brackets** are used to enclose certain computer keystrokes. For example, the operation to press the return key would be shown as **[Return]**.

The Electronic Spreadsheet Software

The electronic spreadsheet **Lotus 1-2-3** is used with this manual. This software program is to be supplied by you or your school. The template disk which is included with this manual contains a number of spreadsheet templates which are partially complete. You will complete each template by supplying the necessary data inputs and/or program formulas.

Organization

The manual is organized into two parts. In **Part One** you will learn to use Lotus 1-2-3 by completing a tutorial. You will then process a number of accounting problems using these spreadsheet skills. Each problem will consist of solving a sample case manually, processing the data electronically, and analyzing your solutions. In **Part Two** you will learn to program Lotus 1-2-3 by completing a comprehensive tutorial. While working a number of accounting problems, you will solve and program the basic relationships manually before creating the electronic spreadsheet. Then you will analyze your solutions. **Appendix A** is an overview of microcomputer hardware and software. **Appendix B** is a reference section for Lotus 1-2-3.

We are confident that learning to **use** and **program** the electronic spreadsheet will provide you with marketable computer skills and a deeper understanding of the principles of managerial accounting. You will then be better prepared to face the challenges of the business world.

*John Wanlass
Phyllis Yasuda*

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The Electronic Spreadsheet

Spreadsheet Perspectives

The electronic spreadsheet is said to be the most widely used computer applications program. The ability to understand and work with electronic spreadsheets is certainly one of the most important skills business employers are looking for. Recent surveys indicate that many employment agencies require a working knowledge of electronic spreadsheets as a prerequisite for employment.

The electronic spreadsheet is popular because it provides practical solutions for a wide range of problems. For business applications the spreadsheet is an essential tool. For the scientist, engineer, and many others, the spreadsheet is used in a wide variety of applications. Whenever a problem involving calculations can be solved with paper and pencil, the spreadsheet is ideal at processing the data electronically.

While some spreadsheet users may not recognize it, the process of expressing and declaring relationships is actually a method of programming. The spreadsheet is a declarative program which defines the relationships between data elements. These relationships are expressed as formulas. Formulas are then used to link the data elements together, forming the overall program. Once established, the programmed spreadsheet can be used to solve any number of different data inputs at electronic speed. This power is just not available with the manual worksheet.

Spreadsheet Basics

An electronic spreadsheet, consisting of **rows** and **columns**, is patterned after the familiar paper and pencil version of the accounting worksheet. The terms "**spreadsheet**" and "**worksheet**" are used interchangeably, but we will try to use the term "spreadsheet" when referring to the **electronic** version and the term "worksheet" when referring to the **manual** version. The following spreadsheet consists of eight rows and two columns. The rows are identified by the numbers 1 to 8 down the left side; columns are identified by the letters A and B across the top. The intersection of a row and column is called a **cell**. With eight rows and two columns, this spreadsheet consists of sixteen cells.

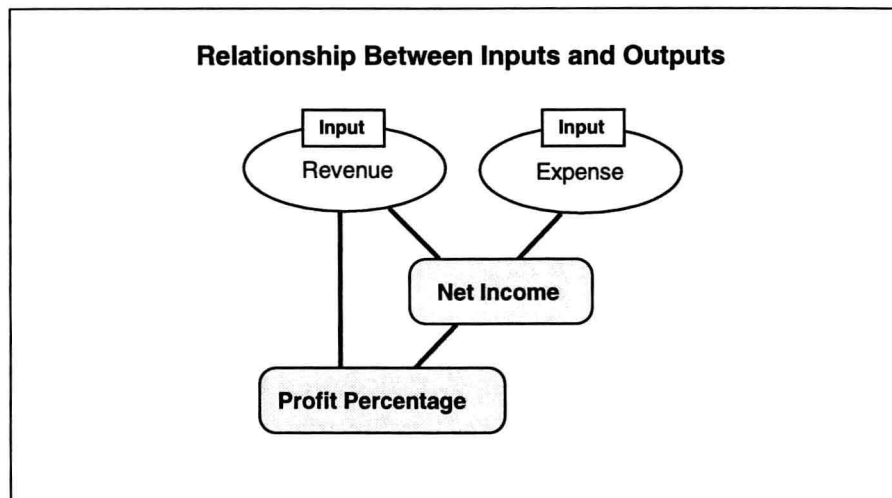
Electronic Spreadsheet Structure			Inputs	
	A	B		
1	Kona Realty		B4	Revenue
2	Income Statement		B5	Expense
3		JAN		
4	Revenue	54,000		
5	Expense	33,000		
6	Net Income	+B4-B5		
7				
8	Profit Percentage	+B6/B4		
			Outputs	
			B6	Net Income
			B8	Profit Percentage

Each cell has a specific address consisting of the column letter and the row number of the cell's location. For example, cell B4 contains the number "54,000" and cell A4 contains the label "Revenue". Cell B6 contains a strange looking group of characters which is called a **formula**. This formula simply says: calculate net income by using the contents of cell B4 (revenue) and subtracting the contents of cell B5 (expense). Cell B8 contains a formula for profit percentage. This formula instructs the spreadsheet program to divide the contents of cell B6 (net income) by the contents of cell B4 (revenue).

A spreadsheet cell may contain any one of three possible types of data:

1. **LABELS.** Labels are used for descriptive or informative purposes only. Labels are not used in calculations.
2. **NUMBERS.** Numbers are supplied by the user and entered directly into the cell. In our example, cells B4 and B5 contain numbers representing revenue and expense: the inputs to the problem.
3. **FORMULAS.** Formulas are programmed instructions which explicitly define the relationships between the numbers input by the user and the calculated outputs produced by the formulas. Formulas determine the outputs to the problem.

In our example, the value for **Net Income** depends on the input values for both Revenue and Expense. The value for **Profit Percentage** depends on the input value for Revenue and the calculated value for Net Income. In a manual solution, the order in which calculations are made becomes important. For example, we would be required to calculate Net Income before we could calculate Profit Percentage. With a electronic spreadsheet, the program would determine the calculation sequence. This makes our job much easier.



The input numbers supplied by the user may change each time the spreadsheet is processed. A change in either of the two inputs will instantly produce the appropriate changes for the related outputs.

Spreadsheet Operations

Spreadsheet Creators

The main tasks of the creator are spreadsheet design and spreadsheet programming. The **design phase** includes a thorough research of the problem. Basic questions must be answered. What are the available inputs and what are the desired results? Who will the primary users be? After researching the problem, a preliminary layout of the spreadsheet is attempted.

In the **programming stage**, the available inputs and the desired results must be related. These relationships are established using formulas. In programming the outputs, the creator does not give the actual results but rather gives the procedure for the calculation of the desired results. These formulas or procedures are entered in the cells where the output results will be found.

Spreadsheet Users

Once the spreadsheet is designed and programmed by the creator, it is ready to be used for its intended purpose, processing data electronically. The user supplies numeric data inputs which are processed by the formulas. The numeric results are displayed and then analyzed by the user. These results may be used as inputs to another problem or they may be used to support decision-making activity.

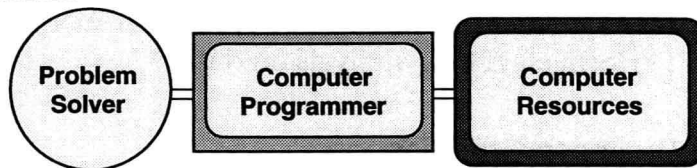
The power of electronic spreadsheets is demonstrated by changing any of the input values and instantly processing the revised results. What would take minutes or hours to process manually can be accomplished in seconds with the electronic spreadsheet. This power allows the user to experiment with many probable inputs to better understand the effects of the decisions which will be made.

Comparing the roles of the Creator and the User

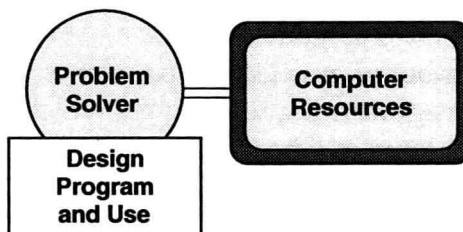
As Entered by the Creator			As Displayed by the User		
	A	B		A	B
1	Kona Realty		1	Kona Realty	
2	Income Statement		2	Income Statement	
3		JAN	3		JAN
4	Revenue		4	Revenue	54,000
5	Expense		5	Expense	33,000
6	Net Income	+B4-B5	6	Net Income	21,000
7			7		
8	Profit Percentage	+B6/B4	8	Profit Percentage	38.89%

The Problem Solver

In the past, the problem solver could only gain access to the computer by working with a computer programmer. The problem solver would describe the problem to the programmer who would in turn design and program the interpreted version of the problem. This process was not only time consuming, but usually resulted in a somewhat less than desirable solution.



The **microcomputer** and **spreadsheet application programs** have brought computing power directly into the hands of the problem solver. With this power, the problem solver can literally become the spreadsheet designer, programmer, and user. The gap between the decision maker and the programmer has in many cases been eliminated. This revolution promises to bring the process of problem solving into better focus. For the accountant, the electronic spreadsheet has become an indispensable tool.



Lotus 1-2-3

Lotus 1-2-3 is the spreadsheet of choice for the IBM PC microcomputer. This popularity stems from 1-2-3's ability to process a wide variety of problems as well as integrate three important functions: the electronic spreadsheet, data-base management, and graphic presentation. These three applications are integrated into a single program.

1

Electronic Spreadsheet

The electronic spreadsheet is the foundation of the 1-2-3 program—an electronic replacement for the traditional financial modeling tools: the accountant's columnar pad, pencil, and calculator.

2

Data Base Management

The column-row structure used to store data in a spreadsheet is similar to the structure of a relational database. 1-2-3 provides true database-management commands and functions. You can sort, query, extract, and perform statistical analysis on data.

3

Business Graphics

The spreadsheet alone makes 1-2-3 a powerful program. With the added graphic capability, the spreadsheet is an extended tool for presenting data and conducting "what-if" analysis.

As you complete the tutorials and application problems in this manual, you will develop comprehensive spreadsheet skills while reinforcing accounting principles and practices. In **Chapter 2** you will experience the power of Lotus 1-2-3 as you complete a user tutorial. In **Chapter 3** you will work a number of application problems. **Chapter 4** introduces you to sophisticated programming techniques which will be used to work the application problems in **Chapter 5**.

