





---

# The Epson Connection: Atari XE/XL

---

Leigh E. Zeitz

Merdyne Publishers, Inc.  
184 Fifth Avenue, New York, NY 10010

Copyright (c) 1986 by Leigh E. Zeitz

Photographs courtesy of Epson America, Inc.

All rights reserved. No part of this book may be reproduced in any way or by any means without permission in writing from the author and the publisher. While all reasonable precautions have been taken to assure that this book is up to date and accurate as of the time of writing, the author assumes no liability for omissions or errors. No guarantee of any kind is given regarding information and directions in the text and no liability is assumed by the author for damages resulting from the use of information contained in this book.

10 9 8 7 6 5 4 3 2 1

PRINTED IN THE UNITED STATES OF AMERICA

ISBN: 0-934299-14-5

---

[Return to Table of Contents](#) | [Cover](#) | [Next Chapter](#)

## Dedication

This book is dedicated to the people who taught me the excitement of learning-my parents, Lewis and Beth Zeitz.

## Acknowledgements

My Greatest Thanks go to my wife, Kathy, whose patience, love and understanding enabled this book to become a reality.

I would like to acknowledge these people for their support:

Thomas Young of SoftWorks for the loan of his equipment.

Tom Sarkisian at Alosta Computers for technical support.

Bryan Kerr at Atari, Inc. for information and photos on the Atari computers.

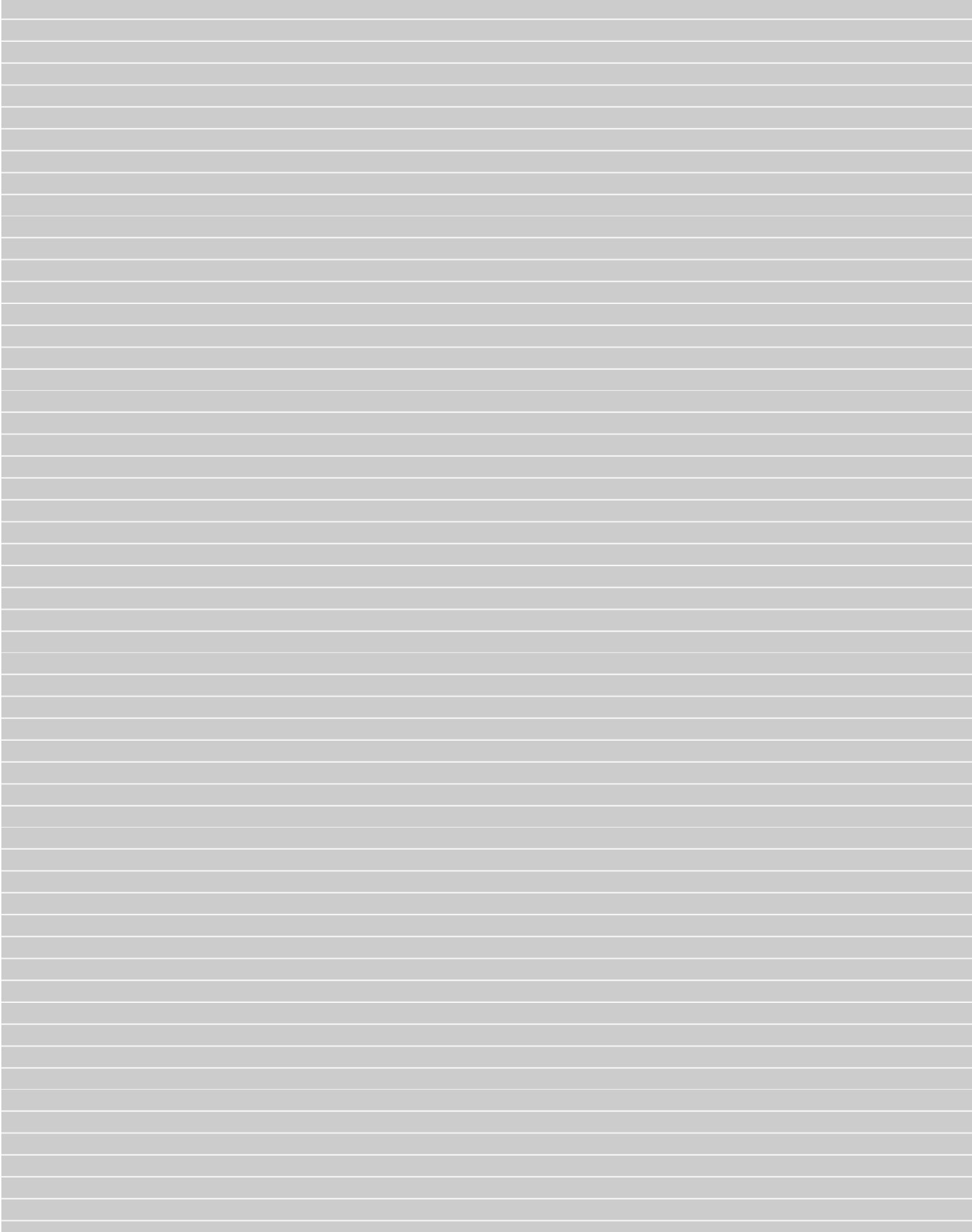
Randall Julin for his helpful review.

Special thanks to these people at Epson:

Margaret Johns, Cindy Kohlmiller, Jill Bauhs and especially Kevin Connors for his help on technical questions.

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)



# PREFACE TO THE EPSON LIBRARY

The Epson Library series of books has been prepared with the full support of Epson America, Inc., including information, technical support and loan equipment. This ensures that the books will be accurate, up-to-date and helpful.

Epson's commitment to this series is based on its commitment to be a full-service computer company, not just a vendor of hardware. Epson has a reputation for value, durability and user-friendliness in its products, and for supporting its users through third party suppliers, user's groups and publications like this book.

The Epson Library is made up of three different kinds of books. Books entitled THE EPSON CONNECTION: IBM-PC (and ATARI, COMMODORE 64, APPLE, MACINTOSH, KAYPRO are designed to help owners of specific computers to get the most out of their Epson owners of specific computers to get the most out of their Epson printers. These books clarify and extend the discussions found in the respective computers' and printers' manuals. They will help you get started with the system you have or are considering, and will provide you with the knowledge to use every feature and capability of the best-selling Epson printer line.

A second group of books are directed to the use of printers and computer systems for people in various professions and occupations. Again helping to clarify the process of getting started with a system involving a computer, a printer and other peripherals, the books also provide ideas and how-to guidance on specific applications for the occupation being addressed. Books in this subseries are available for doctors, lawyers, accountants, engineers, salesmen, writers, real estate and insurance agents, educators, contractors, and small business owners.

The third grouping is of books on topics of interest and value to any present or future computer user. There is a general printer maintenance, troubleshooting and advanced techniques guide-EPSON PRINTERS: TIPS AND SECRETS-a book on the intricacies of telecommunicating made simple-EPSON GUIDE TO PC COMMUNICATIONS-books on business writing, basic graphics, business graphics, personal financial planning using computers, software law for programmers who wish to protect and sell their software, and a review guide to available MS-DOS and CP/M software for Epson computers.

These books are not "sales pitches" for Epson products (although they do give Epson product specifications and use Epson computers and printers to execute their examples-and there is no doubt that Epson will be pleased if what you learn here causes you to conclude that Epson machines are for you), but efforts to be of service not only to people who already own Epsos, but to the computer user in general. Certainly the applications and techniques described in each book can be implemented on any computer system (especially given the preponderance of Epson printers and "Epson-compatibles," and Epson's CP/M and MS-DOS computer compatibility).

Within each book, many topics will be touched upon that are in some ways general and in some ways specific. For instance, a spreadsheet will be discussed differently in THE EPSON CONNECTION: ATARI, EPSON PRINTERS FOR CONTRACTORS, and THE EPSON PC AND PRINTER GUIDE FOR PERSONAL FINANCIAL PLANNING, and while each of those may mention some specific spreadsheet programs, MS-DOS AND CP/M SOFTWARE FOR YOUR EPSON: A DIRECTORY AND REVIEW, will give information on a number of them. We recommend that you consider a CONNECTION book addressed to your computer, an application book addressed to your occupation, and those from the third group that cover topics of interest to you.

In general, the books are written by writers skilled in the art of explaining and simplifying computer use. Often the authors are also members of the profession or occupation being addressed (as with the lawyers' and engineers' books) or especially qualified technically (as with TIPS AND SECRETS). And, though all books contain some optional advanced techniques, all are primarily getup-and-running-quickly-and-easily guides.

Please let us know if these books have been helpful to you, if there are things we should change, or if there

are topics we ought to address in new books or in revisions of the existing ones. Send any comments to:

Epson America, Inc.  
~~2780 Lomita Boulevard~~  
~~Torrance, CA 90505~~

## THE EPSON LIBRARY

THE EPSON CONNECTION: IBM PC. William H. Darnall  
THE EPSON CONNECTION: ATARI. Leigh E. Zeitz  
THE EPSON CONNECTION: COMMODORE 64. Leigh E. Zeitz  
\*THE EPSON CONNECTION: APPLE. W.H. Darnall & D.B. Corner  
\*THE EPSON CONNECTION: MACINTOSH. Rick Dayton  
\*THE EPSON CONNECTION: KAYPRO. Robert Oaks  
MEDICAL OFFICE APPLICATIONS USING YOUR EPSON. Susan R. Dodson  
EPSON PRINTERS FOR LAWYERS AND LEGAL SECRETARIES. John C. Lautsch and Craig R. Schwandt  
EPSON PRINTERS FOR THE SMALL BUSINESS. Robert Oaks  
EPSON PC & PRINTER GUIDE FOR CONTRACTORS. Kenniston W. Lord, Jr.  
EPSON PC & PRINTER GUIDE FOR EDUCATORS. Kenniston W. Lord, Jr.  
EPSON PC & PRINTER GUIDE FOR INSURANCE AGENT. K. W. Lord, Jr.  
\*EPSON PRINTERS FOR WRITERS. Robert Oaks  
\*EPSON PRINTERS FOR BUSINESS WRITERS. Robert Oaks  
\*EPSON PRINTERS FOR ACCOUNTANTS. Rick Dayton  
PROFESSIONAL WRITING AND WORD PROCESSING WITH THE COMMODORE 64 AND EPSON. E.F. Durang  
EPSON PC & PRINTER GUIDE FOR ENGINEERS. Robert Wood and Michael L. Gonzales  
EPSON PC & PRINTER GUIDE FOR SELLING & MANAGING. C.F. Durang  
\*EPSON PRINTERS FOR REAL ESTATE AGENTS. Robert Oaks  
EPSON PRINTERS: TIPS AND SECRETS. W H. Darnall & D.B. Corner  
EPSON GUIDE TO PERSONAL COMPUTER COMMUNICATIONS. Timothy P Banse  
EPSON GUIDE TO SOFTWARE LAW John C. Lautsch  
EPSON GUIDE TO BUSINESS GRAPHICS AND PROFESSIONAL PRESENTATIONS. Gabriel Cuellar  
\*GRAPHICS USING EPSON PRINTERS. Gabriel Cuellar  
MSDOS & CP/M SOFTWARE FOR YOUR EPSON: A DIRECTORY AND REVIEW Michael L. Gonzales  
EPSON PC & PRINTER GUIDE FOR PERSONAL FINANCIAL PLANNING. Robert Oaks

All books available from your local Epson dealer, or your local bookstore, or write to Merdyne Publishers, Inc., 184 Fifth Avenue, New York, New York, 10010. (Books marked with \* available from Reston Publishing Company, care of Prentice-Hall, Inc., Englewood Cliffs, New Jersey 07632).

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)



# Introduction

CONGRATULATIONS!!! Since you are reading this book. I will assume that you are either the proud owner of an Atari computer and an Epson printer or are considering becoming one.

If you are like most people, you have decided that you would like a computer to assist you in your daily activities and have spent hours agonizing over which system would best suit your needs. Finally, after thinking about all of the considerations, including the size of your pocketbook, you have chosen the Atari computer and Epson printer to fill the bill.

Your work is not yet over, however. Although a computer system can make your work easier, it will not do the work for you. You now have the machines to do the work but they are waiting for you to tell them what to do.

Many people forget about this part of using a computer. They don't spend the time learning about the capabilities of computing and become frustrated. This frustration is blamed on the "limitations" of the system and very often the computer is misused, underused, or not used at all.

This book is meant to help you overcome this problem. *The Epson Connection: Atari* book is written to help you integrate your computer system into all facets of your life. You will discover that computers are not just workhorses of the business world. They can be useful machines around the house as well. This is not to suggest that an Atari computer may someday replace your vacuum cleaner, but I am saying that many of the things you do around your household or in your schooling can be made easier with your new system.

## WHO SHOULD READ THIS BOOK?

This book is for anyone who has an interest in making their Epson printer and Atari work for them. As I stated earlier, most computer systems are underused. If you are a beginning computerist, this book will introduce you to using a computer in ways you never thought possible. If you are a professional computer user, you will probably find suggestions in this book that either you hadn't thought of doing or hadn't had the time to implement. I hope that reading this book will make your life a little easier.

This book is also for anyone who wants to interest someone else in their computer system. If you are reading this, you are probably an adult male in his 20s or 30s. Please don't take this a sexist remark if you don't fit the description, but this is what the statistics show. Chances are that you are married with a family. The chances are also very good that you are interested in showing the other family members how they can use computers.

A quick glance down the table of contents will show that *The Epson Connection: Atari* is full of applications for members of your family. It includes hints on using your Epson printer to get better grades on reports, ways to print recipe cards, a program for printing checks on your printer, tips on printing business letters and many other suggestions.

Who should read this book?

YOU should!!!

## OVERVIEW OF THE CHAPTERS IN THIS BOOK

This book is broken into four sections:

- 1) Your Computer System
- 2) The Computer System at Home
- 3) The Computer System at School
- 4) The Computer System at Work

The first section introduces you to your computer system. Chapter 1 takes you on a guided tour of your Epson printer and introduces you to some of its print styles. Chapter 2 gives you a similar tour of your Atari computer as well as the many peripherals which compose the computer system. The two machines meet in Chapter 3 where the process for hooking them together is discussed along with some considerations about where to set up your system. Chapter 4 begins to teach you how to make the system work. It covers the multiple printing styles available with the Epson printer and how to use them.

The second section introduces you to the household applications of your Atari computer/Epson printer computer system. Chapter 5 gives an explanation of word processing and how it may be used to produce letters, lists, and other documents. Computing in the Kitchen, Chapter 6, continues with a discussion of word processing for creating shopping lists. It also includes a couple of BASIC programs. The first creates labels for organizing your pantry and the second prints recipe cards. Chapter 7 discusses how your computer system can make keeping track of your home finances less taxing.

Your Computer System at School includes plenty of helpful advice for letting the computer age help you improve the quality of your work and raise your grades. Chapter 8 is devoted to researching and writing reports. It explains effective methods for managing research information using a word processor, database manager and a BASIC program which prints notecards. A strategy for improving your test scores is included in Chapter 9. Along with this advice there is a BASIC program for printing sample quizzes. The final chapter in this section explains accessing the Epson's printing capabilities through BASIC programming. Beyond the various printing styles, this chapter explains how to turn your Epson printer into a graphic palette.

The last section tells you how you can involve your computer system at work. Chapter 10 provides you with examples of how word processing can make your business correspondence more efficient and more profitable. Chapter 11 discusses using spreadsheet programs for handling your business. It provides examples of how you can spend less time calculating your money and more time making it. Telecomputing is the topic of the last chapter. It explains what telecomputing is and how you can become involved in the most powerful development in computing since the microchip.

This book is multi-sectioned, but each section contains information that can be used in many applications. Don't limit yourself to only the sections that address your immediate concerns. Read the whole book. As you read, think about how the applications can apply to your particular lifestyle. You may discover that a computer can be much more than a business machine for crunching numbers.

## **INVOLVING FAMILY MEMBERS WITH YOUR COMPUTER SYSTEM**

Many people (myself included) find computers both challenging and exciting. Some of us even take our interests to the extreme where these machines monopolize practically every minute of every waking hour (hence the creation of the Computer Widow). Starstruck by the radiance of this terrific machine, we engage in a crusade to introduce everyone around us to the greatest thing since sliced cheese.

Unfortunately, our family members are usually the ones who first feel the results of our selfless crusade. I must warn you that you are treading on tenuous ground unless you proceed with caution.

First of all, DON'T force computers on anyone. Many good parents are worried about providing their kids with the computer skills they will need in the future. Don't pressure your kids into using a computer. It's a lot like riding a bicycle; they'll do it when they're ready.

Secondly, DON'T buy a computer just for your children. Since you're reading this book, it's safe to assume that you already own a computer system. But don't introduce your kids to a computer by surprising them with a computer system one morning. Spending over \$800 on something your children aren't ready to use will cause you to feel cheated and your children to feel pressured. The best way to get your children interested in computing is to let them see you working successfully on the computer. Of course, as their interest increases you may find your time on your computer decreases. This means that you've been successful in your crusade and it may be time to buy another Epson printer and Atari for the kids.

Finally, realize that some people just don't like computers. Typically, these people are of the older generation, but there are some kids who would rather play baseball on a field than on a keyboard. Understand and accept this fact of life. The world will continue to turn if you find that no one else in your family wants to learn how to program. That just means you'll have more time to yourself on your computer.

These are just a couple of hints to keep in mind as you read this book. I have written this book in an easily digestible format with application programs that are easy to input and helpful in using your Epson printer and Atari computer to the fullest.

HAVE FUN!!!



## Using the Programs in This Book

This book includes some BASIC programs designed to help you get the most out of your Epson printer and Atari computer. BASIC may not be the programming language of choice by professional programmers, but it came free with your Atari computer and a price like that's tough to beat. If you prefer working in another language, you're welcome to use these programs as models and translate them into your favorite working medium.

These programs were purposely kept simple. They are quite functional in achieving their goals, but many of the "bells and whistles" were eliminated so they may demonstrate the capabilities of your computer system without requiring you to type volumes of code. I hope you will modify and improve them to fit your specific needs.

Every program over ten lines has a line that reads:

```
10 REM SAVE "D1:program name"
```

This is meant to save you time while typing in programs. You should save your programs often when you are typing them into your computer. This will help guard against losing the information you have so carefully input. When you want to save your programs as you're inputting it, type LIST 10 <RETURN>. Line 10 will appear. Press the Up Arrow three times and then the space bar six times. This will leave SAVE "D1:program name" on the screen. Press RETURN and your file will be saved to diskette. No muss, no fuss. It ensures that you save the file to the same name every time. It's a life saver late at night when you're eyes are closing but your fingers are still pounding.

The most important point of all is to have fun while you are typing and using these programs. If it turns into drudgery, stop for a while and return after you've played a few action games on your Atari Computer.

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)

---

## Chapter 1

---

# This is Your Epson Printer

Most people think of a printer merely as something attached to a computer. But a printer is much more than that. It is the means by which your work is transferred from its electronic form to a printed form. It creates the finished product that others see. It is the Fingerprint of your work.

Epson, Inc. is one of the leading printer manufacturers in the world. It first made its impact in the printer industry with its series of "dot-matrix" printers. Epson's dot-matrix printers have set an industry standard by which competitors are measured. These printers include the MX, RX, FX, LX, JX, LQ and HomeWriter lines.

## THE MX PRINTERS

The MX printers were the original line of printers introduced by Epson. This line contained one of the most popular printers of all time, the MX-80. IBM chose a modification of the Epson MX-80 to accompany its introduction of the IBM PC in August of 1981.

There were two basic versions of the MX printer: the MX-80 and the MX-100. The MX-80 printed at 80 characters per second and used 8 1/2" wide continuous paper with tractor-feed perforations along the edges. It had no roller platen like a typewriter, so it could not push paper through the printer. It had to pull the paper through using tractor-feed sprockets which could be adjusted for the width of the paper. It was limited in its printing capabilities. It could only print in pica, condensed, expanded, and emphasized modes. These print modes were expanded in later versions of firmware (operating instructions on ROM chips).

The Epson MX-100 was released with a 15-inch platen to accomodate larger sheets of paper for printing spreadsheets and other forms of output which couldn't be printed on 8 1/2" paper. The MX-100 also included an improvement in the firmware (Type II) which allowed it to print in higher resolution graphics, skip-over perforations, program the right margins, and print in a total of eight international character sets.

Later, Epson introduced the MX-80 III F/T (for Friction/Tractor feed) which included a platen along with the tractor-feed sprockets. The platen enabled it to print on single-sheet paper as well as continuous-feed computer paper. This printer also included another update of the firmware called Grafrax Plus. This added the ability to print in italics, superscript, subscript, and to underline.

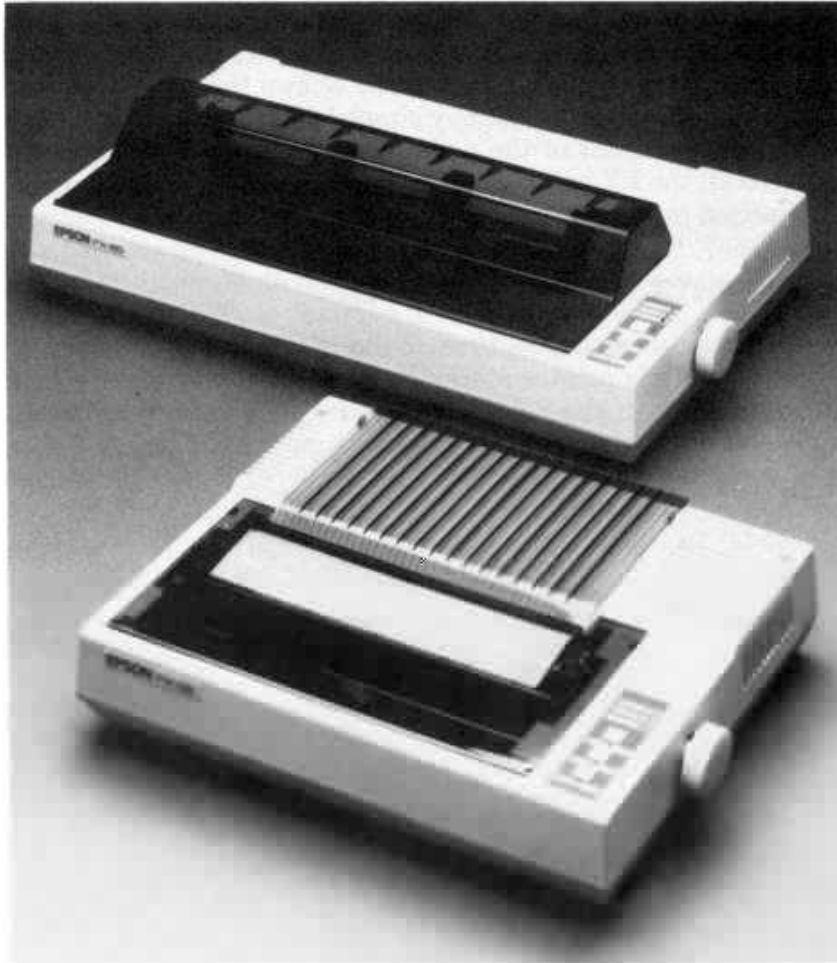
## THE RX PRINTERS

The RX series is an improvement over the MX series. These printers print at 100 characters per second, feature 11 international character sets, 96 italic characters, and 32 graphic characters. In addition, they offer graphic characters which are used by the Epson HX-20 portable computer. The RX series print in pica, elite, compressed, expanded, and emphasized modes.

Like the MX series, the RX-80 and RX-100 can use only tractor-feed continuous paper. The RX series also has F/T models that can handle either perforated rolls of paper or cut sheets. The RX printers can do many more things than the MX printers, but they usually sell for less.

## THE FX PRINTERS

The FX series was introduced in 1983. It is an upgrade of the preceding printer lines. These printers can print at a blinding speed of 160 characters per second. They offer a "pin-feed" platen for bidirectional printing which allows the paper to move both forward and backward for improved printing control.



**Figure 1.1 FX-85 and FX-185 Printers**

This latest series offers graphics resolution twice that of the RX series (240 dots per inch) along with nine international character sets. They can print in pica, elite, italic, condensed, expanded, underlined, and emphasized modes. The vertical line spacing is set at 1/6 inch but can be programmed to n/72 and n/216 inch.

These FX computers contain a 2000-character storage space (buffer) which will hold one-to-two pages of text. This buffer can hold text in memory while the printer is printing it out instead of requiring the computer to wait for the printing to finish before continuing onto the next task.

The FX-85 and FX-185 are the latest in the FX series. In addition to including everything found in the earlier FX printers, these printers feature an 8000-character buffer and the SelecType capability. The SelecType component allows the user to program up to ten different typestyles by simply pressing the control panel buttons on the front of the printer. SelecType was originally introduced on the LX printer series and will be further explained in that section.

## THE SPECTRUM LX-80 PRINTER

In addition to the many features found in the FX-80, the Spectrum LX-80 dot-matrix printer marks a new era in Epson printers with its introduction of the SelecType feature. This feature allows the user to access various

printing modes simply by pressing the control panel buttons in specific sequences. This capability removes many of the headaches previously found by users wishing to vary printstyles in their documents.



**Figure 1.2 Spectrum LX-80 Printer**

Along with the SelecType feature comes the Near-Letter Quality mode. This produces sharp characters which are almost indistinguishable from those printed on a typewriter. Because the method used to produce these letters requires two passes, the speed for Near-Letter Quality printing drops to 16 characters per second from the 100 characters per second speed for normal draft quality.

## **THE JX PRINTER**

The Epson JX-80 might be thought of as a Spectrum LX-80 with the capability of printing in seven colors. Like the LX-80, it can print in multiple fonts which can be software programmable or through the SelecType feature. It has a high level of graphic resolution as well as the ability to print in any of eight international character sets.

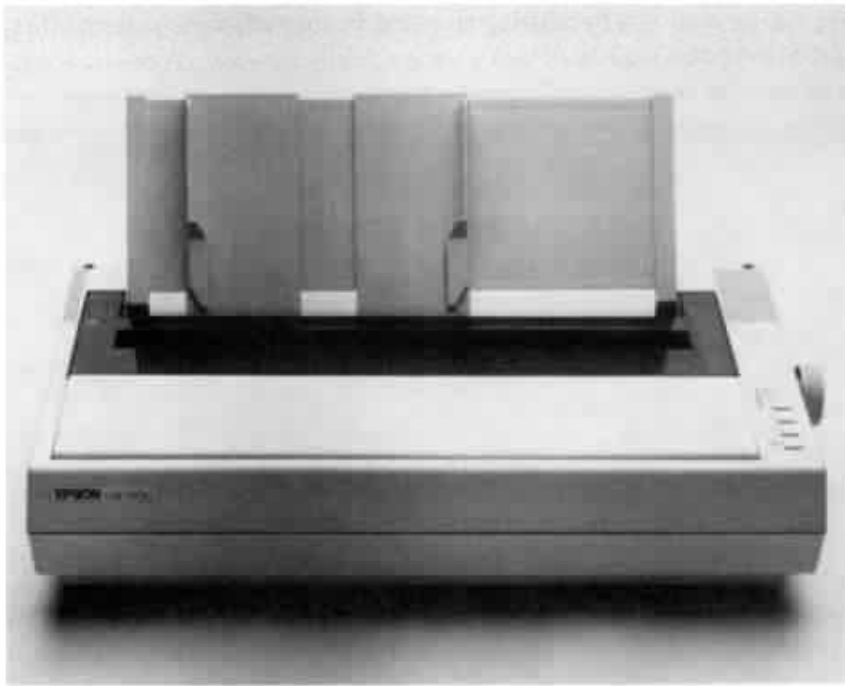


**Figure 1.3 Epson JX-80 Printer**

The color printing is controlled by including a special control code (ESCAPE R) followed by the code for the specific color. The ribbon for the JX-80 contains four colors: black, magenta, yellow, and cyan. These colors are mixed with multiple passes to produce the other three colors: green, orange, and violet. Many software programs are already modifying their programs to make use of the colorful capabilities of the JX-80.

## **THE LQ PRINTER**

The LQ-1500 is the top-of-the-line in Epson dot-matrix printers. Its printhead holds 24 pins instead of the standard nine pins which provides it with resolution that is almost three times that of its siblings. This resolution gives it the capability to produce nearflawless letter-quality characters.



**Figure 1.4 LQ-1500 Printer**

---

The LQ-1500 is both fast and versatile. It prints at 200 characters per second in the draft mode and 67 characters per second in letter-quality mode. It has a character set of 96 standard characters, 96 italic characters, and 32 international characters which can all be printed in letter quality, letter quality/proportional, and draft modes. This machine offers true superscript and subscript modes as well as `many' different printstyles.

## **THE SPECTRUM LX-90 AND HOMEWRITER-10 PRINTERS**

The LX-90 and HomeWriter-10 printers are quite similar to the LX-80 with the slight exception that they "have no brains." They are designed to emulate machine-specific printers for the Commodore 64, Atari XE/XL, IBM PC, IBM PCjr, and Apple IIc. The instructions for these emulations are contained in the unique cartridge interfaces used to connect the LX-90 or HomeWriter-10 with the respective computers.

One advantage to owning the HomeWriter-10 or LX-90 over just using one of the actual printers being emulated is the SelecType feature.

## **THE SQ-2000 INK JET PRINTER**

This printer is different than the rest of the Epson line in that it is a dot-matrix printer that doesn't use pins to make impressions on paper. It uses ink jets. The greatest thing about this style of printer is its quiet operation. While the SQ-2000 prints, you only hear the whoosh of ink being sprayed on paper instead of the rackety clatter of metal pins crashing onto a platen.

This printer prints at 176 characters per second in draft quality, and 106 characters per second in letter-quality printing mode. It supports 11 international character sets and prints in pica, elite, condensed, condensed-elite, expanded, emphasized, italic, superscript, subscript, and underline modes. It comes with a 2000 byte input print buffer which can be expanded to 32,000 bytes with an interface board. This is a versatile and fast printer which can handle anything from correspondence to business graphics.

## **HOW DOES A DOT-MATRIX PRINTER WORK?**

A dot-matrix printer doesn't form letters by striking a piece of paper with a key like on a conventional typewriter. Instead, a dotmatrix printer forms letters by striking the paper with a number of pins in the shape of the desired letter.

Your Epson printer has a set of nine pins arranged in a vertical column. This column of pins travels horizontally across the page firing the necessary pins against the ribbon to form letters. In the draft printing

mode, each letter is composed of an imaginary matrix of dots. This matrix is composed of six columns of nine dots-hence the name of dot-matrix printer (see figure 1.7).

When a capital "P" is to be printed, the printer sends instructions to the print head to shoot forth pins as depicted in Figure 1.8. In the first column, all of the pins in the upper seven rows are pressed against the ribbon (the pins in the two bottom rows are used to print the descenders of letters like "p," "y" and "q"). In the second, third, fourth, and fifth columns only the pins in the first and fourth rows are used. In the final column, the pins in the second and third rows are used to close off the "P"

The imaginary 9x6 matrix used in creating letters

The O's show the dots used to print a "P" Dot-Matrix technology has many advantages. The greatest advantage is versatility. Since each pin can be individually controlled, a dot-matrix printer is not limited to printing only letters. By shooting forth the appropriate pins, it can produce detailed pictures as well. These pictures are created in much the same way as pictures in a newspaper through the use of little dots.

The other great advantage to dot-matrix printers is speed. A computer communicates through electricity. Electricity travels at the speed of light. Although there may be some mechanical limitations to transmitting information that fast, the biggest stumbling block to getting words to the printed page is the speed of the printer.

The conventional procedure for typing characters with a typewriter involves the use of single keystrokes, the spinning of a ball typing element, or the turning of a daisy wheel. Each of these necessitates a short period of time waiting for the proper letter typing element to move into position to produce the desired letter.

A fast typist will type 70 words per minute. This is about 350 characters per minute or about six characters per second. When incorporated into a printer, the typewriter technology for printing letters will usually print

between 13 and 25 characters per second (cps). On an expensive printer with only one printing head, you might get 55 cps.

The dot-matrix printer doesn't have to worry about spinning heads. The printhead moves back and forth across the page striking the ribbon with pins to form letters. The only limitations for speed are how rapidly the head can move from side-to-side and how quickly the paper can be advanced. The speed on these printers will range from 40 to 200 cps.

The greatest disadvantage to a dot-matrix printer is the quality of the characters. As I stated before, these letters are created by a number of dots placed on the paper in the form of a letter. The early dot-matrix printers (models MX-70 and early MX-80) created many poor quality letters. Since each letter had to be created within a small 7 x 5 box of pins (the matrix), some of the letters were strangely shaped. The lower-case "q" and "p" didn't go below the line, which at times made it difficult to tell the difference between a "q" and a "9." Some people didn't like playing "connect the dots" while they were reading.

Since then, great care has been taken by companies like Epson to improve the quality of dot-matrix characters. The descenders on the "q's and p's" now go below the line. The number of pins used to create the letters has been increased to improve the resolution of each letter. As more dots are used to create each letter, the letter appears more solid and is easier to read.

The Epson printers have three print modes that will improve the letter quality and thus, improve the ease of reading. These modes are called Emphasized, Double-Strike, and Near-Letter Quality printing.

In the Emphasized mode, an Epson printer prints each letter twice, with the dots of the second letter slightly to the right of the first. This process fills in the horizontal lines of the characters. The characters produced are darker and more fully formed than the standard letters.

In the Double-Strike mode, each letter is printed twice with the dots of the second letter slightly below the first. This process tends to fill-in the vertical lines of the letters. It also produces characters that are darker and more fully formed than standard printing.

The sharpness of the letters in the Near-Letter Quality (NLQ) mode is created in a fashion that is a bit different than that of the emphasized and double-strike modes. Each of those modes produces its letter quality by printing a letter twice but with a slight offset. In the NLQ mode, the print head makes two passes on each letter but doesn't print exactly the same letter both times.

Figure 1.12 shows six lines of NLQ printing. The first two and the last two lines are perfectly formed. The center two lines, however, look as though the ribbon was running out of ink or something. There is nothing wrong with these two lines. They are demonstrating the difference between the letters printed on the first and

second passes in the NLQ mode.

The center two lines were created by manually advancing the paper between the first and second pass of the print head. Notice that during the first pass, the print head lays down the basic structure of each letter. The 'T's' and the 't's' aren't crossed and the 'e's' don't have the center bars printed. During the second pass, the letters are filled in. The letters are crossed and the centers are filled in. The result is a high-quality form of letter.

Another style of printing that comes in handy when you want to put a large amount of information in a very small space is Compressed. In this mode, your printer "compresses" the letters horizontally. This allows you to print 132 compressed characters in the space of 80 standard characters.

If your Epson printer has the SelecType feature then it has the unique capability of allowing you, the user, to set these printing modes through the use of a combination of keys on the front of the printer. Unlike other printers in this price-range, the Epson printers with SelecType don't require computer knowledge to produce high-quality printing. This feature is called SelecType. The specifics of this feature will be more fully covered in Chapter 4.

## **EPSON PRINTER, MEET YOUR NEW OWNER ...**

Now that you know about some of the capabilities of your new printer, let's take a closer look at it.

If you've never seen a printer before, it might remind you of a typewriter without a keyboard. For all intents and purposes, that's exactly what it is. It is an output device for your Atari computer.

On the outside, your printer looks like a beige box with a knob and some flat buttons. Open up the front panel (the one with the Epson decal) and things will begin to look a bit more interesting. If your printer has a long, black roller that can be turned by the knob it is called a platen. Like a typewriter, this is the roller around which the paper rolls. It gives your printer the capability to push single sheets through using friction. Hence, the name-Friction Feed. If your printer doesn't have a platen, then it is restricted to printing only on paper with perforated tractor-feed holes running long the side.

The squarish metal object that slides back and forth along a bar in front of the platen is the print head about which you spoke earlier. You will see this device rushing from side to side trying to keep up with the information sent by your Atari.

Around the printhead you might find a black cartridge of ribbon. If you haven't installed it, you won't be getting much printing from your printer until you do. This cartridge contains a 20-foot loop of ribbon that is accordion-folded inside.

Installing the cartridge is not too difficult. Hold the cartridge so that the knob and arrow are on top and the ribbon is pointing towards the platen of the printer. Look towards the rear of the cartridge and you will see plastic pins jutting out on either side. If you have an LX, JX or HomeWriter printer, you will find a black plastic platform directly behind the print head. At the rear of the platform you will find hooks under which you must hook the ribbon cartridge pins to secure it. If you have any of the other printers, you will find slots at either side of the printer for hooking the pins. Now level the cartridge into a horizontal position on the platform slipping the ribbon between the printhead and the silver metal facing between it and the platen. You might want to use a pen

or a small screwdriver to guide it into position. Turn the knob on the ribbon cartridge in the direction of the arrow a couple of times to seat the ribbon properly and you're all ready to print.

If you have a platen on your printer, you should have a lever at the left side of your machine marked "RELEASE." This is similar to the paper release lever on a typewriter. It controls the amount of friction used to push the paper through the printer. When it is in the back position, the platen pushes the paper through the carriage using friction. This is useful when you are printing on single sheets of paper like letterhead.

When the lever is towards the front in the "RELEASE" position, turning the platen has little effect on feeding the paper through the carriage. This is used chiefly when you are printing with continuous paper that has sprocket holes on the either side. If you plan to use continuous paper, you should definitely acquire the optional tractor unit that fits into the holes in the lid of your Epson printer on either side of the platen.

The tractor unit has gear-like sprockets with pins that fit into the holes on the edges of the paper. These sprockets pull the paper through the carriage and ensure a smooth feed. Tractor-feed sprockets come standard with platenless printers, but are optional on the other printers. It isn't absolutely necessary to use a tractor unit if you wish to use continuous paper, but I have found in using printers like the LX-80 and HomeWriter-10 that continuous paper is less likely to snag if it is used with a tractor feeding device.

I might also mention that if you are using the optional tractor unit you should have the "RELEASE" lever pushed forward to the released position. Trying to use the tractor unit with a friction feed situation can lead to wrinkled and torn paper. The tractor pins are trying to "pull" the paper through while the platen is trying to "push" the paper through. These two forces don't always coincide and can lead to torn paper.

## **INSERTING THE PAPER INTO YOUR EPSON PRINTER**

Before you can do any printing, however, you must insert some paper. You could try printing without, but all of your work would end up on the platen. Have you ever tried putting three holes in a platen and clipping it into your notebook? It's not easy.

It won't matter whether you use single sheets or continuous paper. Threading paper into your printer is the same either way. Be sure that the power is off and the print head is moved into the center of the platen. Push the release lever forward into the "RELEASE" position. Place the straight edge of the paper (it's more difficult if the paper is torn or jagged) into the slot about halfway back on the top of the printer. With a hand on each side of the paper, press the paper evenly down and around the platen so that it pokes up between the print head and the platen. If you are having problems accomplishing this, try rocking the paper from side-to-side while pushing downwards.

Once the paper has peeked up on the other side of the platen, pull the paper bail away from the platen and thread the paper underneath. Push the bail back towards the platen and the paper will be held firmly against the roller.

If you are using the tractor unit, continue to pull the paper through the roller until the front edge of the paper is about two inches above the pin feed holders on the unit. Open the clips on each of the pin feed holders and try to fit the sprockets into the holes on the side of the paper. You may have to adjust the horizontal position of the pin feed holders to line them up with the edges of the paper. To do this, pull the locking levers on the pin feed holders forward. Place the left holder about 3/4 of an inch from the extreme left position and lock it there by pushing the locking lever back. Leave the other holder unlocked.

Open the clip on the left holder and fit the sprockets into the holes on the left side of the paper. When you have done so, close the clip to secure the paper into place. Now open the clip on the other holder and slide it into a position that will allow you to easily fit the paper holes onto the sprocket. Close the clip on the holder and flip the locking lever back to secure the holder into position.

If you aren't using a tractor unit, flip the release lever back to the friction feed position and you're ready to roll.

There, you're ready.

## **BRINGING YOUR EPSON PRINTER TO LIFE**

"Master, it lives!" The paper's loaded and your Epson printer is ready to go! Let's see what it can do.

The actual explanation of how to put your printer through its paces will be covered in Chapter 4, but you can see it print without even hooking it up to your Atari computer.

Begin by plugging in your printer. Make sure that the power switch on the side of the printer is turned off. If you have a HomeWriter-10 or LX-90, your PIC (Printer Interface Card) must be plugged into the back of your

printer but it doesn't have to be connected to your Atari computer.

Now find the function button labeled "Line Feed" and press it while you turn your printer on with the power switch. As your printer comes to life, it will click a few times and the printhead will bounce back-and-forth. Suddenly, you will see "VERSION COM 1.1" print across the page and then continuous lines of characters will begin printing. This is the test pattern and it will continue until you turn off your printer.

If your printer is equipped with the SelecType feature, you can see this same test pattern in Near-Letter Quality mode. Repeat the process except press the "Form Feed" button while turning on your printer. You'll notice that these characters have a different appearance from the first test pattern.

There you have it! Your Epson printer is more than a pretty box. It's functional too.

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)

---

## Chapter 2

---

# This is Your Atari Computer

The Atari computer family contains some of the most widely used computers in the home market today. They were able to integrate the graphics and sound capabilities which were Atari, Inc.'s trademark in the video game arena with the capabilities of a personal computer.

As with the rest of the personal computer industry, the Atari computer line has experienced constant evolution. It began with the original models 400 (16K) and 800 (48K) which introduced the world to the potential of a low-cost computer system. These machines were well received for their superb sound and graphics capabilities.

Then Atari upgraded its product line with the XL series including the 600XL, 800XL and 1200XL. These computers included many improved features and an upgraded Random-Access Memory (48K in 600XL and 64K in 800XL and 1200XL models). The latest model in this series of computers is the 130XE computer. This computer comes complete with Atari BASIC and 128K of RAM, truly the most powerful machine of the series.

This book is written to help you in integrating your XE/XL computer with any one of the Epson printers. All of the programs and most of the information contained in this book will work with any of the XL computers or the 130XE. For the sake of simplicity, I will be using the Atari 800XL as the example computer.

## ATARI COMPUTER

Although your Atari computer may just look like a keyboard, it is a complete computer which has more memory and more features than the large expensive computers of just a few years ago.

This small beige box is the workhorse of your computer system. If you were to remove the cover, you would find a circuit board covered with small black boxes called microprocessors. This is where it stores, manipulates and processes information.

## THE KEYBOARD

At first look, the Atari computer keyboard resembles that of a regular typewriter. Upon closer examination (of the 800XL), you will notice keys on the left and right of the keyboard that are unique to the Atari computer. On the left, you will see keys marked with:

- 1) ESC,
- 2) CLR/SET/TAB, and
- 3) CONTROL.

On the right, are keys for:

- 1) CLEAR/,<,
- 2) INSERT/,> ,
- 3) DELETE/BACKSPACE,
- 4) four keys with directional arrows, and
- 5) a half-shaded rectangle (inverse video key).

Even further to the right is a column of five keys. These keys are marked:

- 1) RESET,
- 2) OPTION,
- 3) SELECT,
- 4) START, and
- 5) HELP

These are function keys. Their functions may be defined by a program that is running on your Atari computer. This means that not all of them may be functional in all of the programs. The program will tell you how they are to be used.

## OUTLETS, PORTS AND HOLES

Your Atari computer communicates with the outside world through the outlets and ports found on the top, right and rear of the computer. On the top, you'll find a cartridge slot. This is where cartridge-based programs are connected into the system. Although most cartridges contain games, there are many fine applications programs like AtariWriter which can also be found on cartridge.

On the right side you'll find two ports. These ports are for any of the various external control devices available for the Atari computer. These devices include joysticks, paddles, light pens, and digitized pads.

Across the back are five connections and two switches. From left to right are:

- 1) Peripheral Port-this serial port connects with the disk drive or printer adapter;
- 2) Parallel Bus-this is the parallel connection to the outside world. It will be used with most Epson printers;
- 3) Monitor Connection- a direct 5-pin connection for color computer monitors. Will not work with a television;
- 4) TV Connector-supplies both the audio and video to your television set;
- 5) Channel Selector-selects the output channel on your television from channel 2 or 3;
- 6) Power In-Port-connect your power supply to this port;
- 7) Power Switch-turns power on or off.

Each of these connections allows your Atari computer to communicate with other devices, computers, or humans. Without these connectors, your computer would be a useless machine because it would have a limited way to receive information and no way to dispense its processed information to be used.

## THE MONITOR-A WINDOW TO THE ACTION

Many people are under the misconception that typing on the computer places information into the monitor. This is a reasonable assumption because the characters appear on the screen and the screen is part of the monitor. The monitor, however, has no place to store this information. It is only a viewport. It is a window to the activity happening within your Atari computer.

Your Atari computer can use either a standard television (black-and-white or color), or a special video monitor to display its information. The television for a monitor is the least expensive since almost every home has one. The video monitor, on the other hand, produces a much clearer picture than a television and is easier on the eyes when using your computer for long periods of time.

## 410 PROGRAM RECORDER

When you turn off your computer, all of the information that is stored within it is lost. If you spent 3 hours typing in a chapter of a book and then turned off your Atari computer, you would lose all of your work and would have to redo it. To avoid this problem, you could leave your computer on 24 hours a day, or find some way of saving the information in a way that could later be loaded into the computer to be used.

Atari has an inexpensive way for you to save your data. It is called the 410 Program Recorder. This is a specially adapted version of a cassette tape recorder that will record your information on tape in such a way that can be reloaded into your computer at a later date. It connects into the peripheral port on the back of your Atari computer.

Once the 410 Program Recorder saves information onto a tape, it is unable to retrieve only specific programs for use in the computer. This is a disadvantage because the 410 Program Recorder must load the complete contents of the tape into your Atari computer so that your computer can sort through and find the information it needs. This means that one cassette may fill your computer's memory with several programs when the desired program is only 3 kilobytes long.

## DISK DRIVES

Another way to store information is with a disk drive. A disk drive is similar to a record player in operation except it has the ability to both play and record. The disk drive records information or programs on 5 1/4-inch

disks called "floppy diskettes."

A disk drive is more expensive than a 410 Program Recorder, but it is much faster and provides a more efficient use of the internal memory of your Atari computer. A disk drive stores information in specific locations on floppy diskettes. When you request information from the disk drive, it can look for the title of that file in its directory, locate that position on the floppy disk and load only the pertinent information into your computer. This means that your computer's memory will not be burdened with unnecessary programs and information, leaving more workroom for your programs to run.

Both the model 810 and 1050 drives will work with the Atari XE/XL computers. This means that you can upgrade from a 600XL to a 130XE and not have to buy new drives.

## POWERING UP YOUR ATARI COMPUTER

Once you have your Atari and all of its peripherals hooked together, it's time to turn on the power. The Atari computer is especially sensitive when it's turned on so I have included the suggested power-up procedure.

The most important part of this power-up/power-down procedure is to turn your computer on LAST and to turn it off FIRST. The order of the peripherals is actually inconsequential but I have found this order to be the easiest.

- 1) Turn on your monitor or television.
- 2) Turn on your disk drive (make sure you don't have any diskettes in it when you do) or 410 Program Recorder.
- 3) Turn on your Epson printer.
- 4) Turn on your Atari computer using the power switch on the right side.

When you have finished using your computer system, turn them off in the reverse order.

- 1) Turn off your Atari computer.
- 2) Turn off your monitor.
- 3) Turn off your disk drive.
- 4) Turn off your Epson printer.

This is your Atari computer. Together with your Epson printer it can make a powerful workstation that will enrich your life and make many of your day-to-day activities easier and more productive. The next chapter will describe how to hook them together and where to set them up for maximum efficiency.

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)

---

## Chapter 3

---

# Setting Up Your Epson Printer and Atari Computer

Now that you've been formally introduced to your Epson printer and Atari computer, it's time to introduce them to each other. They'll be working together.

### FINDING A LOCATION

Where to set up your computer system may not sound like too much of a problem, but it is one that too many people spend too little time considering. This often results in non-users having hard feelings about the computer always being in the way or, it's placed so "out of the way" that the computer is forgotten or not fully used because of the inconvenience of its location. This is a decision that needs to be made and should not be taken lightly.

The first factor you should consider is how you plan to use your computer system. Will it be for running your business or your kitchen? Will you be writing term papers or shopping lists? Will you be balancing your checkbook or juggling your accounting homework? The application you now have in mind will probably change as you read this book and become better acquainted with the capabilities of your computer, but it's helpful to have a goal in mind as you begin.

Once you have your application in mind, start looking around your house for an appropriate spot for your system. If you'll be running your business with your Atari computer and Epson printer then you may want to put it your study or office. If you'll be using it for managing your kitchen, you'll need it near the cooking end of your house. No matter what your kids may tell you, if your computer will be directed towards schooling they'll get the most from it if it's located away from stereos and cable TV.

You're beginning to realize that other factors are wriggling their way into the formula. Here are some things you should consider:

- 1) **The Monitor**-Using the family television for a monitor dictates exactly where you'll be setting up your office. It will also dictate when you'll be able to use it. The rest of the family won't think too kindly about your plinking the keyboard while their favorite TV shows are playing. These sorts of problems may prompt you into buying a computer monitor or a second television much sooner than you had planned.
- 2) **Electrical Availability**-These creatures live on electricity so make sure there's an outlet nearby. You may need two 110-volt outlets because you'll have at least four electrical cords that need to be plugged in. This problem can be surmounted by using a power bar. An electrical power bar is designed to accommodate four to six electrical units at a time. Some bars even come with a switch that will allow you to turn on all of the outlets at once.
- 3) **Electrical Circuits**-Even if you have enough outlets, you need to consider the amount of load that you will be placing on the electrical circuit. Your system will be drawing less than 3 amps from the circuit so there is little chance of it overloading a circuit by itself.

|                |   |           |             |
|----------------|---|-----------|-------------|
| Atari Computer | - | .4        | amps        |
| Video Monitor  | - | .85       | amps        |
| Disk Drive     | - | .5        | amps        |
| Epson Printer  | - | <u>.6</u> | <u>amps</u> |
| Total          |   | 2.35      | amps        |

If you have other electrical instruments or appliances on the same circuit, adding your computer system may be enough to overload it.

If overloading isn't a problem, these other appliances may cause your computer some other problems. Some appliances such as refrigerators or air conditioners cycle on and off throughout the day. When they turn on, they draw extra current from the electrical line. This momentary hoarding of electricity can cause your computer system to suffer from a short loss of power. This loss of power might be enough to erase the data in the temporary memory of your Atari computer. The safest step would be to have your computer running on its own separate circuit. This can be costly but may be worth the expense if you come to rely upon your computer. If you have any questions about the electrical aspect of your computer system, consult an electrician.

4) **Environmental Conditions**-The area around your computer system should be free of dust and smoke.

Particles can build up on the microprocessors inside the computer to cause it to overheat. You should also look out for cat hairs, peanut butter, lemonade and the like. These things can clog the mechanical parts or cause the whole system to short circuit.

5) **Noise Disturbance**-Consider the proximity of the kids' playroom, the family stereo, or outside noises. These can become annoying when you are trying to accomplish some serious work. Conversely, if you plan to work late at night, set up your work station away from bedrooms where you might disturb others.

6) **Telephone Proximity**-A telephone may not seem necessary now except as a convenience, but, as I will discuss in Chapter 13, telecomputing is an exciting world that you will want to explore.

## CONNECTING YOUR EPSON PRINTER TO YOUR ATARI COMPUTER

Now for the connection. Your Atari Computer is designed to send information to printers through its serial peripheral port. This isn't a problem if you're using an Atari printer designed to accept information from the computer in serial format. The Epson printers I have been discussing in this book, however, are all parallel printers. They must receive information from the computer in a parallel format. This means you must use something to convert your Atari's serial output into a parallel input for your Epson printers.

The conversion from serial to parallel is accomplished through what is called a parallel printer interface. This is a connector which attaches to the peripheral port of your Atari computer. It acts as a clearinghouse for the information being sent from that serial port. It provides a parallel output port for your printer as well as serial output ports for your disk drives. You might call this the control center for your Atari peripherals.

Atari manufactures a parallel printer interface called the Atari 850. This tends to be the standard in the Atari world because it is guaranteed to be 100% compatible with your Atari computer.

Other manufactures produce parallel printer interfaces as well. Here is a list of other interfaces you might consider, which are available at Atari dealers and advertised in magazines addressed to Atari users.

### Parallel Printer Interfaces

A-16 (with 16K buffer) by Digital Devices

ApeFace XLP by Digital Devices

ApeFace 12 XLP

Atari 850 by Atari, Inc.

Icepic Printer Interface by Iceco

Microprint Interface by Microbits

MPP 1150 by Microbits

Turbo Print

U-Print A by Digital Devices

## USING THE PARALLEL PRINTER INTERFACE

The Atari 850 Parallel Printer Interface is a grey box with ports on three sides. Your Atari attaches to the 850 interface through the peripheral port on the back of the computer. This is the same port used to interface with the disk drive. Consequently, your disk drives must communicate with your Atari through the 850 interface.

Your Epson printer also receives information from your computer through the 850 interface. Data is sent from your Atari computer to the 850 in serial form. The 850 converts the information to a parallel format and then passes it on to your printer through the cable connected to the port in the back of its box.

Let's test the connection. Begin by turning on your system using the procedure explained in Chapter 2. Your screen should display "READY". Type in this program EXACTLY as it is here. Remember to press the RETURN key at the end of each line.

```
LPRINT "HELLO, I AM YOUR EPSON PRINTER"
```

Type RUN and press the RETURN key. If your printer introduced itself to you-CONGRATULATIONS!! You're ready for action. If your printer stayed silent, follow these guidelines to find the problem:

- 1) If the power light isn't lit-turn on the printer.
- 2) Make sure the 850 Interface is plugged in and turned on.
- 3) Check to see that the cord is plugged firmly into your Atari computer and 850 Interface.
- 4) Check to see that the cord is plugged firmly into your 850 Interface and Epson printer.
- 5) Is there paper threaded through the printer?
- 6) Type LIST and press RETURN. Check that you typed the program into your computer exactly as it appears on this page.
- 7) Type RUN and press the RETURN key again. If your printer still refuses to introduce itself, review the steps one more time and then contact your dealer.

Now that they're talking, let's see what you can do with this powerful pair.

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)

---

## Chapter 4

---

# Making Your Epson Printer Jump Through Hoops

Now that you have your Epson printer and Atari computer connected and talking, it's time to get fancy. Your Epson printer is a smart little machine and with its help you can make:

It's all in the wrist.

### PRINT STYLES

A print style is the style in which a printer types text. Your Epson printer for the Atari computer offers several different print fonts. They may include:

- Draft (or Standard) Dot-Matrix
- Elite Dot-Matrix
- Emphasized Dot-Matrix
- Double-Strike Dot-Matrix
- Expanded Dot-Matrix
- Italics Dot-Matrix

Reverse Dot-Matrix  
Compressed Dot-Matrix  
Near-Letter Quality

These styles, along with a variety of combinations, provide you with a palette-full of printing options to make your writing more interesting. In this chapter, I will discuss how to use your Atari computer and Epson printer to produce these characters. In the following chapters we will investigate how to use them to bring life to your writing.

## HOW TO ACCESS THE PRINT FONTS

In the past, the only way to tell a printer which print style you wanted to use was to send it numeric printer codes. The ease with which this could be done usually depended upon the type of software you were using and your level of computer sophistication.

The latest generation of dot-matrix printers by Epson (which include the JX, LX, FX and Homewriter-10 printers) sports a feature called "SelectType." SelectType allows you to set some of the print fonts by pressing the buttons on the front of your printer. You must still choose some of the fonts through print codes, but SelectType makes talking to your printer as easy as pressing a button and counting to four.

## SELECTYPE

SelectType enhances the printer options typically offered on an Atari computer. Depending upon the printer you're using with your Atari computer, you can set from three to ten different type styles through the SelectType feature using the three buttons on the control panel.

These type styles can include: Near-Letter Quality, Compressed, Expanded, Double-Strike, Emphasized, Elite, Italic, Underlined, SuperScript, SubScript, and even the ability to skip over perforations when printing program listings on continuous paper.

Let's imagine that you have a striking letter that you want to print using the double-strike mode. Using SelectType, you can just tell your printer that you want to use the double-strike print style and let your Epson printer do the rest of the work.

The sequence for setting a type style:

- 1) Turn off the printer and turn it back on to clear the memory. This prevents mixing-up the signals to your printer.
- 2) Turn on the SelectType function by pressing the FORM FEED and ON LINE buttons simultaneously. This should cause your printer to beep. If it doesn't, return to step 1 and try again.
- 3) Select your desired type style by pressing the ON LINE button the correct number of times. Press ON LINE three times to select Double-Strike. (Figure 4.1 indicates SelectType options on some of the Epson printers. The Mode column indicates the number of times the On-Line button must be pressed to select the desired option.)

---

| MODE | PRINTER       |               |               |
|------|---------------|---------------|---------------|
|      | LX-80         | JX-80, FX-85  | HomeWriter-10 |
| 0    | Reset         | Reset         | Reset         |
| 1    | NLQ           | Compressed    | NLQ           |
| 2    | Emphasized    | Expanded      | Emphasized    |
| 3    | Double-Strike | Elite         | Double-Strike |
| 4    | Compressed    | Emphasized    |               |
| 5    | Elite         | Italic        |               |
| 6    |               | Double-Strike |               |
| 7    |               | Underline     |               |
| 8    |               | SuperScript   |               |

---

**Figure 4.1 Comparative chart of SelecType settings.**

- 4) Once you have pressed ON LINE the appropriate number of times, press the FORM FEED rectangle once to set your selection into the printer's memory.
- 5) Turn the SelecType function off by pressing the LINE FEED rectangle once. This will turn the ON LINE light off.
- 6) Press the ON LINE button once more to prepare it for printing. The ON LINE light will reignite and your Epson printer will be ready to receive your letter from your Atari computer.

If you don't have a letter that you want to print but you still want to see what your Epson printer can do with SelecType, here's a BASIC program that will demonstrate what your Epson printer can do.

```

10 REM SAVE "D1:SELECTYPE DEMO"
20 REM * * DEMONSTRATES THE SELECTYPE PRINT STYLES + + 30 DIM A$(1) Z$(40)
40 PRINT CHR$(125)
80 PRINT :PRINT "      PRESS RETURN TO BEGIN PRINTING"
100 PRINT "      THE SELECTYPE DEMO":PRINT :PRINT
110 PRINT "      THIS PROGRAM WILL DEMONSTRATE THE"
120 PRINT "      SELECTYPE FEATURE OF YOUR EPSON"
130 PRINT "      PRINTER. IF YOUR PRINTER DOES NOT"
140 PRINT "      SUPPORT THE PRINT MODE BEING "
150 PRINT "      DEMONSTRATED, PRESS THE RETURN KEY"
160 PRINT "      TO ADVANCE TO THE NEXT SELECTION."
170 GOSUB 800
200 Z$="THIS IS COMPRESSED PRINT"
210 PRINT "SET THE PRINTER FOR COMPRESSED PRINT"
220 GOSUB 800
230 GOSUB 750
250 Z$="THIS IS EXPANDED PRINT"
260 PRINT "SET THE PRINTER FOR EXPANDED PRINT"
270 GOSUB 800
280 GOSUB 750
300 Z$="THIS IS ELITE PRINT"
310 PRINT "      SET THE PRINTER FOR ELITE PRINT"
320 GOSUB 800
330 GOSUB 750
350 Z$="THIS IS EMPHASIZED PRINT"
360 PRINT "SET THE PRINTER FOR EMPHASIZED PRINT"
370 GOSUB 800
380 GOSUB 750
400 Z$="THIS IS ITALICIZED PRINT"
410 PRINT "SET THE PRINTER FOR ITALICIZED PRINT"
420 GOSUB 800
430 GOSUB 750
450 Z$="THIS IS DOUBLE-STRIKE PRINT"
460 PRINT "      SET PRINTER FOR DOUBLE-STRIKE PRINT"
470 GOSUB 800
480 GOSUB 750
500 Z$="THIS IS UNDERLINED PRINT"
510 PRINT "      SET PRINTER FOR UNDERLINED PRINT"
520 GOSUB 800
530 GOSUB 750
550 Z$="THIS IS SUPERSCRIPED PRINT"
560 PRINT "SET PRINTER FOR SUPERSCRIPED PRINT"
570 GOSUB 800
580 GOSUB 750
600 Z$="THIS IS SUBSCRIPTED PRINT"
610 PRINT "      SET PRINTER FOR SUBSCRIPTED PRINT"
620 GOSUB 800

```

```

630 GOSUB 750
650 PRINT "WOULD YOU LIKE TO DO THIS AGAIN (Y/N)";
660 INPUT A$
670 IF A$="Y" THEN GOTO 40
680 PRINT " IT'S BEEN NICE PRINTING WITH YOU"
740 END
750 PRINT "      RESET YOUR EPSON PRINTER"
760 PRINT
770 RETURN
800 PRINT :PRINT "      PRESS RETURN TO BEGIN PRINTING";
810 INPUT A$
820 OPEN #1,8,0,"P:"
830 FOR R=1 TO 5
840 PRINT #1,Z$
850 NEXT R
860 PRINT #1,:PRINT #1,
870 CLOSE #1
880 PRINT :PRINT " * * * * * " :PRINT
890 RETURN

```

**Figure 4.2 BASIC Program for SELECTYPE Demo**

---

This program is designed to display the various SelecType print styles available on your printer. When you run the program it will prompt you to "Set the printer" to a specific type style. Follow the steps just outlined to set your printer and then press the RETURN key. Your Epson printer will come to life and print five lines in the selected print font. If your printer doesn't offer the style of print described by the SELECTYPE demo, just press RETURN to continue to the next style.

A couple of problems may occur. If you run the program and your printer doesn't print, check to see that it is on and the ON LINE button is lit. On the other hand, if your printer prints all of the lines of print in the same font, it means that you aren't resetting your printer to clear the memory before you give it a new setting.

## USING NUMERIC PRINTER CONTROL CODES

There may be times when you want to control the type style directly from a program instead of manually pressing buttons on your printer. This can be done by using your Atari computer to send numeric printer control codes to your Epson printer. This ability gives you more flexibility in your creations than when you are trying to incorporate SelecType fonts, but you may find it to be a bit messy.

You can inform your printer that you want to print in expanded letters through a BASIC command like this one:

```
LPRINT CHR$(27); CHR$(14);"THIS IS EXPANDED PRINT"
```

This command uses LPRINT (Line PRINT) to send the quotation over the "lines" to the printer instead of sending it to the screen. The CHR\$(27) tells the printer to prepare itself for a printer control code to follow. The CHR\$(14) is the printer control code which tells the printer to switch into the Expanded Printing mode. In expanded mode, the letters are twice the size of standard print. This means that instead of the typical ten characters per horizontal inch, your printer can only fit five characters within a horizontal inch. You'll see the difference when you type this line into your Atari and press RETURN.

This same command line may be used to print a line of small letters in what is called the Compressed Mode. The compressed mode is almost half the size of the standard mode. It fits 17 characters to the horizontal inch. The only changes in the program line are in the printer code and the message.

```
LPRINT CHR$(27); CHR$(15);"this is compressed print"
```

Now that you're in these special printing modes, you may be wondering how to return to the standard printing. The expanded printing will only remain active for one line so you probably won't have to manually turn it off. If you want to, however, use CHR\$(20).

```
LPRINT; CHR$(27); CHR$(14);"This is expanded print"; CHR$(20); "This isn't"
```

You can return from the compressed mode using CHR\$(18).

```
LPRINT CHR$(27); CHR$(18); "This is standard print"
```

If you're wondering what these magical numbers mean, it's a good question. The numbers following the CHR\$ are part of a larger set of codes called the American Standard Code for Information Interchange (ASCII).

The ASCII codes represent the language used by your Atari computer and Epson printer to communicate. Computers don't "think" using letters, they can only represent characters with numbers. When your Atari computer wants to send the letter "Z" to your Epson printer it sends the number 90. The "%" sign is represented by the number 37 and interestingly enough, the numeral "6" is given the value of 54 in the ASCII code.

These ASCII codes are also used to send commands to your printer. As you've seen, expanded, compressed and standard print modes are represented by the numbers 14, 20 and 15, respectively. Other commands are sent by ASCII as well. Your Atari computer can also tell your Epson printer to advance one line with a code of CHR\$(10) and insert a carriage return with CHR\$(13). So you can see how important these codes are to the working of your machines.

The ASCII character set is divided into two parts; those ASCII characters ranging from zero to 127 and those ranging from 128 to 255. If you want to see the first half of the characters offered in your printer you can look in the appendix of this book, in the manual that came with your printer, or run the following program.

```
10 OPEN #1,8,0,"P:"
20 FOR T = 0 TO 127
30 PRINT#1; T; CHR$(T);
40 NEXT T
50 CLOSE #1
```

You may have noticed the printer advanced to the next page in the middle of running this program. That's because the ASCII code value of 12 elicits a Form Feed from the printer. Actually, a variety of unusual actions can happen when printing the ASCII codes zero through 20. These are the nonprinting printer control codes which your Atari Computer uses to control your Epson printer. From ASCII 21 to 127, however, you will see a variety of characters printed.

You'll find very little difference in the characters printed in the first 128 ASCII values on any of the Epson printers. This set of characters is a standard and should be found on every printer. The differences occur in the second set of values (128-255). As printer technology increases and needs change, the characters in this upper half of the ASCII set are used to fulfill the needs. You can run the following program on almost any two of the Epson printers and you'll find the characters differ.

```
10 OPEN #1,8,0,"P:"
20 FOR T = 128 TO 255
30 PRINT#1; T; CHR$(T);
40 NEXT T
50 CLOSE #1
```

You can also send printer codes to your Epson printer through an applications program like a word processor. I will explain how to do this in the next chapter. If you've never used a word processor, you're in for a big treat. The best way to describe it is an electronic means for typing a letter without ever having to say your sorry (or swear at the typewriter).

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)



---

## Chapter 5

---

# Word Processing Applications for the Household

Perhaps the most versatile application of your Atari computer and Epson printer computer system is word processing. This is the application which can most greatly change your lifestyle because you'll find that almost everywhere you have been using a pen or pencil to accomplish a task, you can use a word processor with results that look neater and more organized.

In this chapter, I'll discuss how you can use your computer system creatively to write letters or help your children write their own stories. You can use it productively to create a shopping list or a list of things to do. You can even use it to publish your own newsletter. The list of uses for word processing is as endless as the list of things you can do with a pencil and paper.

### WHAT IS WORD PROCESSING?

Perhaps I should start with a brief explanation of word processing. In simplistic terms, word processing is a form of an electronic typewriter. You can sit down to your Atari computer, press some of the keys on the keyboard and the corresponding characters will appear on the screen. Through this process you can create letters, lists, reports and even books.

Notice, however, I said that the characters appear on the screen and not on a piece of paper. The most important difference between using a typewriter and a word processor is that when you type a word it is not written on a piece of paper but rather placed within the memory of the computer. The advantage is that words on a word processor can be changed, added, deleted and even moved without having to worry about erasing, scratching-out or painting your paper with correction fluid. Where a typewriter is an instrument for producing a finished product, a word processor is a tool for developing that product and molding it into its finished form. You might say that writing with a word processor means "never having to say your sorry."

Is your Atari computer a word processor? No, it is not. It is a microcomputer. But it can be instructed in how to work like a word processor through a word processing program like Atariwriter, PaperClip, Bank Street Writer or any of a number of word processors developed for the Atari computer. When these programs feed their instructions into your Atari computer, it can act as a word processor.

It isn't the intention of this book to teach you how to use a word processor. It is, however, the intention to teach you to use a word processor in such a way as to utilize your printer to its utmost capability.

Your Atari computer and Epson printer computer system is much more versatile than the conventional typewriter. It joins the ease of word processing with a large variety of print styles. For fast print, you may use the Draft Dot-Matrix style. Formal correspondence can be given a professional look with Near-Letter Quality. Expanded letters make titles. Compressed letters can provide the fine print of contracts. You can even use Reversed print when you want to make a line stand out. It's like having five typewriters in one.

Invoking these type features is almost as easy as pressing a button. Some of these types are available through the SelecType feature of your Epson printer while others can be controlled directly through your word

processing program.

The SelecType fonts have already been discussed in the last chapter, so I won't spend time re-explaining how to use them. They are controlled directly from your Epson printer and run independently from the software running on your Atari computer.

Some of the printing types can be controlled directly from your word processing program through special coding. There are many word processors on the market for the Atari computer, but for purposes of demonstration, I will be referring to the two most popular word processors for the Atari computer, Atariwriter by Atari and PaperClip by Batteries Included.

## CONTROLLING YOUR EPSON PRINTER THROUGH A WORD PROCESSOR

Controlling your Epson printer through a word processing program is accomplished by proceeding a line of text, such as a title, with specific codes which tell the printer that the following letters are to be typed in that specific form. It is also necessary to end this line of text with a specific code to tell the printer to return to the standard mode of print.

For example, refer to the printer control characters discussed in Chapter 4. Imagine that you are creating a paper entitled "Controlling Your Epson Printer" and want to begin it with a title printed in expanded print. This may be created with a line that looks like this:

```
CHR$(14) Controlling Your Epson Printer CHR$(15)
```

The CHR\$(14) at the beginning of the line sets your printer into the expanded mode. The printer then prints the title in expanded letters. Finally, the CHR\$(15) returns your printer to the standard mode for printing the rest of the paper.

This is how your title will appear:

**Controlling Your Epson Printer**

The actual way in which you signify these printer codes will vary from word processor to word processor. Atariwriter's system for sending control codes to your Epson printer varies from that used by PaperClip.

These are some examples of how these word processors would create the same effect:

### Atariwriter:

```
SELECT E Controlling Your Epson Printer SELECT E
```

The SELECT E represents pressing the SELECT key and the E key simultaneously. This switches your Epson printer into the expanded mode (called elongated mode in Atariwriter). The printer is then switched back into the standard mode of ten characters per inch by pressing SELECT E at the end of the line.

Using this method of sending control codes, Atariwriter will allow you to set four styles of printing.

```
(CTRL)G 1 Standard print (10 cpi)
(CTRL)G 2 Compressed print (17 cpi)
(CTRL)G 3 Proportional spacing
SELECT E Expanded mode
```

If you are using an Epson printer, you may find the SELECT E to be inoperational. If this is the case, use (CTRL)G 3 instead of SELECT E to induce the Expanded mode.

You may have difficulty making Atariwriter communicate with your Epson printer. This is because it needs some additional instructions to know what to send to produce the various styles of type. There are programs like the Print Driver Construction Set-for Atariwriter from the Atari Program Exchange which allow you to configure Atariwriter to your Epson printer.

## PaperClip:

(CTRL)F/O Controlling Your Epson Printer (CTRL)F/O

The (CTRL)F indicates that you want to set the Print Pitch. To set the pitch at five characters per inch (Expanded mode), you must select the (O)ptional pitch which is defined as 5 cpi. At the end of the line, you press (CTRL)F to enter the Print Pitch selection mode again. Now you want to return to the standard 10 cpi printing mode. Press 0 (zero) to indicate you want 10 cpi.

PaperClip allows much more variety in printer output than Atariwriter. Using the already identified control codes for the MX80 and FX-80, you can print in Bold Face, Italic, Underline, Superscript, Subscript, as well as the already explained print pitches.

---

(CTRL) B      Bold Face

(CTRL) I      Italic

(CTRL) U      Underline

(CTRL) S      Super/Subscripts

## Printed on the Epson Printer

---

## Controlling Your Epson Printer (Expanded)

Producing professional-looking documents with your Epson printer can be easy. All that it requires is a working knowledge of the necessary control codes for your printer, an understanding of how to use those control codes within your word processor, and a little bit of practice.

Your Epson printer is quite a versatile computer. It has SelecType features that allow it to print in a wide variety of type styles. It can also be controlled from your Atari computer to print in EXPANDED and compressed print.

This is how this document would appear when typed into the Atariwriter word processor:

This is how it would appear when typed into the PaperClip word processor:

## **INTEGRATING SELECTYPE FEATURES WITH A WORD PROCESSOR**

Integrating the SelecType feature with your word processor can be a bit more complicated. It is best explained on two levels.

The first level of using SelecType with your word processor entails simply setting your desired print style and then printing a document. It is the same process as explained in Chapter 4. Prepare your document, set SelecType for the desired type face, and start printing.

The second level of using SelecType with your word processor is a bit trickier. It involves mixing fonts on the same page. This can produce pages that are interesting to see as well as easier to read. It takes a bit more work, but the results are worth it.

## **MIXING TYPE STYLES WITH SELECTYPE**

Mixing type styles on a page using SelecType involves a three-step process. You must first stop the printer at the point where you wish to change the print mode, then you must reset the SelecType controller to the desired type style, and finally you must restart the printer until the next change is needed at which point the process is repeated. This may sound cumbersome at first, but once you master a few tricks it should be as easy as falling off of a platen.

Let's suppose you have a document which you want to print in NLQ type style, but in the center of the page there is a paragraph you would like in compressed mode. Begin by setting your printer to NLQ style printer and then start your printing.

Your document will begin printing in the NLQ mode. But you want to change the type style halfway down the page. This means you must stop the printer before it reaches that point so that you may change the setting. Watch carefully, and when the print head reaches the correct spot, press the On-Line button. This will cause your printer to stop. Once stopped, your printer is ready for more instructions. This way is effective but not always accurate.

A more efficient manner for stopping your printer at precisely the correct spot is to include a command within your document. This command will tell your computer to stop sending information to your Epson printer when it reaches that point and wait for further instructions. Some word processors even allow you to insert a message which will appear on the screen reminding you of what must be done when the printing pauses.

Thank goodness for little favors...

As with all printer control commands, telling your printer to pause is accomplished differently with different word processors. Atariwriter doesn't provide this capability, but PaperClip uses the command:

(CTRL)Z W

Place (CTRL)Z W in your document where you want to change print settings. Your printer will stop and wait for you to make the necessary changes before you start it off again by pressing the START key.

Once you've stopped the printer, you must reset the settings. This process would be quite impractical and in some cases impossible if resetting the printer could only be accomplished by turning your printer off and then on again. Most word processors discontinue sending information to a printer after it realizes that the printer has been turned off.

Have no fear!! There is another way.

The SelecType feature is equipped with a reset capability. While the other SelecType options are set by pressing the On-Line button a specified number of times, the reset function is activated by not pressing the On-Line button at all. This means that you turn SelecType on in the usual manner but instead of selecting a print function by pressing the On-Line button, press the Form Feed, and then the Line Feed buttons to erase any SelecType setting that is presently in the printer. Pressing the On-Line button then brings your printer back On-Line.

To reset the SelecType feature on your Epson printer:

- 1) Press the On-Line and Form Feed buttons simultaneously. This will cause your printer to beep.
- 2) DON'T select a print function by pressing the On-Line button.
- 3) Set the function by pressing the Form Feed button once.
- 4) Press the Line Feed button once.
- 5) Press the On-Line button one last time to put your Epson printer back on line so it may communicate with your computer.

Once you have reset your Epson printer, you can then set it to the SelecType printstyle you desire for your document. In our imaginary case, you would then set the SelecType function to the compressed mode. Your document would then print in compressed mode until it reached the next Pause command where you could return it to NLQ printing.

## WORD PROCESSING APPLICATIONS AROUND THE HOUSE

### Letters

The most obvious use for a word processor around the house is writing those formal letters that you have to type to insurance companies, creditors, colleges and even to Jeffrey's teacher excusing him from missing school. You need a professional-looking letter, flawlessly typed, without typing and re-typing and re-re-typing.

The nature of word processing makes letter writing a breeze. Composition and correction is easier and your Epson printer will give it a truly finished look. Yet, there is even another facet where you can use your Atari computer word processor to make correspondence easier.

The format of a formal letter includes a heading (return address), inside address (mailing address), salutation, body of the letter, and closing. The heading, salutation, and closing are basically the same on every letter. Imagine the time you could save if you could use a form for writing these letters where you just have to enter the mailing address, addressee's name and the body of the letter.

It's possible to create such a form for letter writing using your word processor. Figure 5.4 shows such a form.

This is a form that you can use to create your formal letters. Notice that in the upper-right corner is the heading which will be the same in every letter you write. Directly below the heading is the date. When you write the actual letter, you can type right over the word DATE. There are three Xs on the left margin. Since the inside address is different with every letter, these Xs indicate its location. The salutation follows with space for the first name of the addressee. The closing and signature name are included at the close of the letter since they remain the same.

Use your word processor to create this form (modifying it to reflect your name and address). Then save it on

a data disk or tape under the name FORMAL LETTER. You now have a form for writing formal letters.

To use your form, load FORMAL LETTER into your word processor. Enter the date, inside address, and first name of the addressee. Then write your letter. When you have completed your letter, save it on your data disk or tape under another name like INSURANCE LETTER. This will save your new letter as well as retain your form in the file entitled FORMAL LETTER.

---

1m10:rm70

256 Sunset Avenue  
Formal City, California 91100  
\*DATE

\*RECIPIENT  
\*ADDRESS1  
\*ADDRESS2

Dear \*RECIPIENT

Sincerely,

John P. Borkus

#### Figure 5.4 Letter Form

---

You may wish to use this same procedure to create different letter forms for different purposes or for people you contact often. Either way, you will find that using letter forms with your Atari/ Epson computer system will make your correspondence easier and more productive.

### Personal Letters

Although business letters are expected to be typed, I've found many people actually take offense to receiving a personal letter in typewritten form. I guess there is something a little more personal when you know that the sender has spent the time to take pen-in-hand to write a letter. Then there are those of us who are simply more comfortable writing with a keyboard. With some help from your Epson printer and Atari computer, there may still be hope.

The main complaint about typewritten letters is the lack of personal care. Using what you've learned about the many type fonts available with your computer system, you can give quite a personal touch to your letters. Here is an example of a letter with "That Extra Something."

By the way, word processing is also a great tool for catching up on those dozens of letters you owe your friends. Write a basic letter talking about what's been going on in your life lately, and then save it to diskette. Then change the heading and rewrite the first paragraph to give it the personalized touch. When it's complete, save it to disk or print it out and start on your next letter. It's an efficient way to make a repetitious task manageable.

## Creative Word Processing

Word processing is also a good tool for creative writing. It frees you from worrying about making a mistake and allows you to express yourself. You can do a little poetry, write a story, even keep a diary. What better way to illustrate life's up and downs? Shout about your good times with Expanded print and diminish your failures with compressed type.

Word processing is an ideal system for helping your son or daughter express themselves as well. More will be covered about using your Epson printer system to create school reports later in this book, but sitting your child in front of an Atari computer keyboard may yield pleasant surprises.

Have you ever noticed that your children seem to have a continual stream of talk. They have thoughts on everything and express them freely-with or without prompting. But when you place a piece of paper in front of them and ask them to write about something, they immediately complain "I don't know what to write!!"

The reluctance to write is often founded more directly upon a fear of writing words on paper than a lack of ideas. Ask a child to tell you a story and you'll find an imagination full of ideas. Children find the spoken word an easy tool for self-expression. They have spent a lifetime building their skills in speaking and if they make a mistake, they can easily correct themselves and continue.

The written word, on the other hand, is not as easy to manipulate. When a word is written down, it's no longer an abstract unit of meaning. It is a physical "thing" that must be dealt with in the physical world. It cannot be easily changed or modified. It must be erased or crossed out. Erasures and cross-outs make a messy paper. Kids don't like messy papers so they feel impelled to rewrite them. Rewriting is a long, laborious task. No one likes laborious tasks so it's just easier not to write in the first place.

Using a word processor to write stories can eliminate much of the fear. Words of light on the computer screen are easier to manipulate. They can be changed, moved or deleted without leaving a mess. Rewriting is no longer a problem. Instead of a laborious task, it is now a continuous process of molding the text until it is composed to the liking of the author.

The word processor can even be used with youngsters aged four through seven. These kids have lots to say but they don't have the writing skills and, in some cases, the fine motor coordination to write stories with a pencil and paper. This is where you, the parent, can help nurture their creativity.

An excellent way to build excitement and enthusiasm in storytelling/writing for youngsters is to have them tell you stories. Make it into a game. They tell you a story and you listen intently. It will be slow at first, but after a few sessions you will be surprised at the active imaginations your kids possess.

When your child is comfortable with telling you stories, start entering them into the word processor as he speaks. This will allow him to concentrate on the story while you worry about transcribing it into written form.

You won't find your child lacking in storylines.

Once you've immortalized your child's story in your word processor, you can print it out and share it with the young author.

Use the expanded mode when you print out the story. This will make it easier to read for your child. Because expanded type is twice as wide as standard type, you will only be able to print a maximum of 40 characters on a typical 8 1/2 x 11 inch sheet of paper.

Now use this printout to help your child make a book. Cut out the sentences and glue one on each page of a picture book. Have your child draw a picture to go on each of the pages.

Here are a few hints for making this process successful:

- 1) Set your margins for 40 characters.
- 2) Press RETURN at the end of each line. This will ensure that your lines aren't restructured by word wrap.
- 3) Print out the story double-spaced.
- 4) Limit the text to about one sentence per page.
- 5) Read through the book with your child several times before he starts illustrating the sentences.

After your child has completed his pictures, read it through with him again. This will become HIS (or HER) book. It may replace the bedtime story books. You may find him reading it to himself when he is alone.

You will probably find that your child is memorizing the story instead of reading it word-for-word. This is OK. A large part of reading is memorization.

If your child is interested in learning the words in his story as individual words, it would be helpful to make a list of the words used in the story. Use this list to make "flashcards" of these words. An easy way of doing this would be to use the Label Maker program listed in Chapter 6. Print labels in expanded print and affix one to each of a pack of 3" x 5" index cards.

Take these words and place them into a shoe box for your child. This will be HIS (or HER) collection of words from HIS (or HER) story. You won't need to force him to learn the words. This sense of possession will make reading a matter of pride rather than drudgery.

## **Making Lists on Your Epson Printer**

Your word processor and Epson printer make a dynamic duo when it comes to organizing your life. The best way to ensure that you accomplish all the tasks that you set out to do is to work from lists. You need a list of "things to do," "things to buy," "places to go," and "people to see/pick up." The task of making these lists is a simple one, but organizing your day from these lists can mean copying and recopying your lists until they're legible and in a form that you can use.

Creating those lists on your computer system can alleviate both of the problems you confront when you create a list the "Gettysburg way" by scribbling them on the back of envelopes. First of all, they are legible. Every list is typewritten so you won't find yourself buying nine loaves of bread instead of four because you couldn't read your writing. Secondly, they're easy to reorganize. Instead of crossing out and recopying, you may create each list only once by making all of your changes before you print it. If further changes are required, it's a matter of making the changes and then producing another typewritten copy instead of having to handcopy the complete list again.

## **Things to Do**

Creating a list of things to do can be done in ten minutes, but it can save you a couple of hours a day in misdirected activity. Use your computer system to create your list and you'll save even more time.

The best way to start a list of things to do is by sitting down to the keyboard and typing anything that comes to mind. Many people waste time trying to think of tasks in specific order and forget other tasks in the process. By using the method of free association, you allow your mind to flow and have a greater chance of remembering things on the first pass through.

List each of the tasks as they come to mind. Nevermind the order. Place each on a separate line. When you have completed your list, begin to prioritize the list in your mind. This list of priorities should help you decide the order in which things must be completed.

Now use your word processor to move the tasks into order. This is the order in which you will be completing them during the day. When you have finished, review it again and adjust anything that is still out of

order.

Some of your tasks are more important than others. Include before each of these the printer control code to print them in expanded print. This will make them stand out and will help assure that they will be completed.

Now print out the list on your Epson printer, stick it in your pocket and prepare yourself for a productive day.

The possibilities with word processing are almost limitless. I have only touched upon a few possible uses in this chapter but you will develop your own as you become more familiar with it.

The next chapter will discuss using your computer system around the kitchen. It's quite a time saver for making labels, shopping lists, recipe cards and the like.

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)

---

## Chapter 6

---

# Computing in the Kitchen

The thought of having a computer in the kitchen brings forth visions of an Atari computer spotted with spaghetti sauce, a monitor nestled on the canister shelf and an Epson printer clacking away atop the microwave oven. This is not a sight seen in many households and is not necessarily in your future if you want your computer system to help you make your kitchen duties a little more tolerable.

Your Atari computer and Epson printer don't even have to be in your kitchen to help you in your culinary pursuits. You can use them to organize and print a shopping list. They will create labels for canning and freezing. Your recipe box will never be the same after you use your computer to create and file your favorite recipes.

### SHOPPING LIST

In the last chapter, I discussed using a word processor to make lists. A real timesaver in the kitchen is to create your shopping list on a computer. It produces lists that are neat, orderly, and easy to use.

Most people make a shopping list by looking at what they have in their cupboards and then trying to remember what they don't have. This is backwards. It would make more sense to have a list of items that are usually in the cupboard and then make a note of what's missing.

Conquer this incongruity in human nature through your Atari Computer and Epson printer. Spend an hour and make a list of the various items you usually have in your cupboards. As you did with your list of "things to do," don't worry about order when you first write them down.

After you have created your list, group the items by moving them around on your screen. This will help you remember forgotten items and make shopping easier when you get to the store.

Use this list to identify what's missing from your cupboards when it's time to go shopping. After you have decided what you need to buy, load your list from your data disk or tape into your Atari computer. Use your word processor to delete all of the items except those you need to buy. This will cut down the length of your list and make it easier to understand.

The final step in organizing this list, though you may not want to go this far, is to organize it by shopping aisle in your favorite grocery store. This may sound a little fanatic and a bit overwhelming, but it isn't really.

You've probably had the experience of going through a store, using a shopping list, only to find that you have to go back through the store to pickup things you've forgotten because you didn't see them on the list when you were in that aisle. This is because your list wasn't organized by the way in which you were buying. The way to beat this is to organize your list the way the store organizes its food.

At first glance, this seems like a futile attempt because stores seem to be always changing the way they stock items. Surprisingly, though, the end displays are changed regularly, but the stocking of products on the aisle shelves is rarely changed.

You may also scoff at the idea because you think you don't always go to the same store to shop. Think for a minute and you may realize that, except for special bargains, you usually go to one specific store to buy your groceries. Most people are creatures of habit who find a store they like and go there to buy groceries everytime. All you need to do next time you go to your store is write down the categories for each aisle and use them to

reorganize your shopping list.

A little time spent organizing a job like shopping can make life much sweeter. Organizing it on your word processor could almost make it fun.

## **LABELS**

Open any pantry or refrigerator door and you'll probably see one of two things; lots of blank containers filled with foods of varying descriptions and ages, or a potpourri of labels affixed to an assortment of food containers. The first case poses all sorts of possibilities when one is hungry and has the courage to venture into this uncharted wilderness. The second situation at least prepares the adventurous gourmet for upcoming treats, but things would look much neater if the labeling procedure was consistent throughout.

Your Atari computer and Epson printer can come to the rescue. The following program, The Label Maker, will print labels in expanded, standard or compressed print. This means that you can shout general contents, or completely describe the contents along with other important information about the date stored and final date for use.

## **THE LABEL MAKER**

The Label Maker is designed to print on labels that are 1" x 3½" in size. These labels are available in single column (one-up), pinsprocketed sheets that feed neatly through your Epson printer. I would strongly suggest, however, if you plan to print many labels on your Epson printer you should invest in the optional tractor feed unit. This device will feed your labels through the carriage smoothly and evenly. Without it, you may have problems with the labels twisting and jamming.

When feeding labels through your Epson printer, you would be well-advised to take a hint from secretaries who type file labels on their typewriters: Remove the first three or four labels from the sheet before trying to feed the labels through your printer. This may sound like a waste of labels, but it will save you both time and money in the long run.

Removing these labels provides a clean leader that may be fed through your carriage without the labels getting caught and jamming in the machine. If a label comes off while it is feeding through your Epson printer, it may clog the passageway and prevent any paper or labels from passing through the machine. Such a problem will either cause you to waste time trying to free the caught label or even require you to take your printer to a service center to have the machine disassembled to remove the stray label.

Begin loading your labels by pressing the RELEASE lever forward. Thread the label sheet along the left side of the carriage, under the platen and up the front of the printer so that they will rest between the print head and the roller. Then fit the pinfeed holes onto the sprockets of the tractor feed unit. If you don't have a tractor feed unit, pull the RELEASE lever back so that the labels will be pushed through using the friction feed.

## **LABEL MAKER**

Once you have successfully fed your labels through your Epson printer, you can run the Label Maker program. You will first be asked what size typeface you want to use for your labels. Answer this with the letters E, S, or C.

Then you must decide how many lines of text you want to print on each label. The size of label for which this program is designed will only hold six vertical lines so that is the maximum allowed. Later, I will explain how you might alter the program to provide for larger labels.

A new screen will now appear telling you to "Type in your lines of text:". This is where you create your label. Type in what you want printed on the label and press RETURN when you reach the end.

After typing a line of text, you may see an error message appear across the screen indicating that your line was too long. When you chose the size of typeface for your labels, it imposed a limitation upon the length of a line. This limitation is based upon the number of letters that will actually fit upon a label.

Expanded-15 characters long  
Standard-30 characters long  
Compressed-60 characters long

If your line is longer than the allotted length, the error message will appear. You'll get another chance to type

the line after all the lines have been entered.

When you have completed typing all of your lines of text, the Label Maker will ask you if "Are all the lines correct (y/n)?". Here's your chance to make good if you make any mistakes. A negative answer will produce an additional question about the number of the incorrect line. Identify the incorrect line and the numbered prompt for that line will appear. Re-enter that line correctly.

Once the text has been correctly entered, a new screen will appear asking for the quantity of labels you wish to print. There is no limit to the number you can print. After choosing the amount, another prompt to "PREPARE YOUR PRINTER" will appear. If you chose compressed as your type size, the screen will also prompt you to set your Epson printer into the compressed mode.

When all is well, press RETURN to bring your printer to life.

After the last label has been printed, the program will ask if "You want to print more of these labels (y/n)?". This feature allows you to print another batch without having to input all of the text again.

Usually, you'll want to test the position of text on a label before printing a large quantity of them. Begin by asking to print only one label. If it prints in an acceptable format, answer "Y" to the "more labels" question and then proceed to print the larger quantity of them. If the format is unacceptable, however, answer "N" to this question, make the necessary changes to the positioning in the printer, and print another single label. Continue this until you are satisfied with the outcome. Once you're satisfied, start the presses rolling.

Once you've finally completed printing this set of labels, answer "N" to the question and it will ask if "You want to print another set of labels (y/n)?". This allows you to jump back to the beginning of the program without having to reboot the system again.

---

```
10 REM SAVE"D1:LABELS"
20 REM * * PRINTS SINGLE OR MULTIPLE LABELS
30 DIM F$(1),S$(60),S1$(60),S2$(60),S3$(60),S4$(60),S5$(60),S6$(60),Z$(1)
100 PRINT CHR$(125)
110 POSITION 12,1:PRINT "THE LABEL MAKER"
120 PRINT :PRINT " THIS PROGRAM WILL PRINT SINGLE OR"
130 PRINT " MULTIPLE LABELS IN 7/8X3-INCH FORMAT."
140 PRINT " THESE LABELS MAY BE PRINTER ON YOUR"
150 PRINT " EPSON PRINTER IN EXPANDED, STANDARD,"
160 PRINT " OR COMPRESSED SIZE."
170 PRINT :PRINT " WHICH DO YOU WANT (E,S OR C)";:INPUT F$
180 IF F$="E" THEN C=14:LL=15:GOTO 220
190 IF F$="S" THEN C=18:LL=30:GOTO 220
200 IF F$="C" THEN C=15:LL=60:GOTO 220
210 GOTO 100
220 S1$="":S2$="":S3$=" ":S4$="":S5$=" ":S6$=" ":S$=""
225 PRINT :PRINT " HOW MANY LINES DO YOU WANT ON"
230 PRINT " YOUR LABEL (6 LINES MAXIMUM)";:INPUT L
240 IF L<0 OR L>6 THEN 220
245 PRINT CHR$(125)
250 PRINT :PRINT " TYPE IN YOUR LINES OF TEXT:"
260 PRINT :PRINT " #1 ";:INPUT S1$:IF LEN(S1$)>LL THEN GOSUB 550
265 S=1:IF S=L THEN GOTO 320
270 PRINT :PRINT " R2 ";:INPUT S2$:IF LEN(S2$)>LL THEN GOSUB 550
275 S=2:IF S=L THEN GOTO 320
280 PRINT :PRINT " N3 ";:INPUT S3$:IF LEN(S3$)>LL THEN GOSUB 550
285 S=3:IF S=L THEN GOTO 320
290 PRINT :PRINT " 84 ";:INPUT S4$:IF LEN(S4$)>LL THEN GOSUB 550
295 S=4:IF S=L THEN GOTO 320
300 PRINT :PRINT " #5 ";:INPUT S5$:IF LEN(S5$)>LL THEN GOSUB 550
305 S=5:IF S=L THEN GOTO 320
310 PRINT :PRINT " #6 ";:INPUT S6$:IF LEN(S6$)>LL THEN GOSUB 550
315 S=6:IF S=L THEN GOTO 320
320 PRINT :PRINT " ARE ALL THE LINES CORRECT (Y/N)";:INPUT Z$
325 IF Z$="Y" THEN GOTO 350
330 PRINT :PRINT "WHAT NUMBERED LINE NEEDS CORRECTING";:INPUT N
335 IF N<1 OR N>6 THEN 330
340 PRINT :PRINT " #";N;:PRINT " ";:INPUT S$
342 IF N=1 THEN S1$=S$
343 IF N=2 THEN S2$=S$
344 IF N=3 THEN S3$=S$
345 IF N=4 THEN S4$=S$
346 IF N=5 THEN S5$=S$
```

---

```

347 IF N=6 THEN S6$=S$
349 GOTO 320
350 PRINT CHR$(125):PRINT :PRINT " HOW MANY LABELS DO YOU WANT";:INPUT P
360 POSITION 10,4:PRINT "PREPARE YOUR PRINTER"
380 PRINT :PRINT " PRESS RETURN TO START PRINTING";
390 INPUT Z$
410 FOR R=1 TO P
420 LPRINT CHR$(C);S1$
430 LPRINT CHR$(C);S2$
440 LPRINT CHR$(C);S3$
450 LPRINT CHR$(C);S4$
460 LPRINT CHR$(C);S5$
470 LPRINT CHR$(C);S6$
480 NEXT R
500 PRINT :PRINT :PRINT " DO YOU WANT TO PRINT MORE"
505 PRINT " OF THESE LABELS (Y/N)";:INPUT Z$
508 LPRINT CHR$(18)
510 IF Z$="Y" THEN PRINT CHR$(125):GOTO 350
520 PRINT :PRINT :PRINT " DO YOU WANT TO PRINT ANOTHER"
525 PRINT " SET OF LABELS (Y/N)";:INPUT Z$
530 IF Z$="Y" THEN 100
540 PRINT :PRINT :PRINT " IT'S BEEN FUN PRINTING WITH YOU!!"
545 END
550 PRINT :PRINT " TOO LONG. ";LL,, :PRINT " CHARACTERS MAXIMUM."
560 RETURN

```

**Figure 6.1 The Label Maker**

## HOW TO MODIFY THE LABEL MAKER

As I mentioned earlier, this program is written for printing on labels that are 1" x 3½" in size. You may have a reason to print on a label that is larger. If you have such a need, it isn't difficult to alter the Label Maker to fit your needs.

The two dimensions you will want to change are the number of lines allowed on a label and the length of each line. The number of lines allowed on a label requires some complex changes. Line 240 regulates the number of lines printed on each label. It says:

```
240 IF L < 0 OR L > 6 THEN 220
```

You can increase the number of lines on a label by increasing the value of 6.

Once you have increased the number of lines, however, you must also increase the variables used to accommodate the text to be printed on the new lines.

These are the changes necessary to increase the number of lines printed on the label from 6 to 7:

```

222 S7$=""

317 PRINT :PRINT " #7 ";:INPUT S7$:IF LEN(S7$)>LL THEN GOSUB 550
318 S=7:IF S=L THEN GOTO 320

348 IF N=7 THEN S7E=S$

475 LPRINT CHR$(C);S7$

```

These lines exemplify the types of modifications necessary to alter the number of lines on a label. If you wish to increase that quantity beyond 7, make your changes accordingly.

Changing the number of characters on a line is approached a bit differently. It depends upon the size of print style used to create each label. An expanded letter is twice the size of a standard letter and a standard letter is twice the size of a compressed letter. Thus, it is not possible to fit as many expanded letters on a label as it is compressed letters.

| TYPE SIZE  | # OF CHARACTERS<br>PER INCH |
|------------|-----------------------------|
| Expanded   | 5                           |
| Standard   | 10                          |
| Compressed | 20                          |

Use this chart to compute how many characters can fit on the size label you intend to use. You may do this by multiplying the length of the label by the number of characters per inch for each type size. Remember to leave some space on the label for margins.

Line numbers 180, 190, and 200 set the limits for the number of characters allowed on a line for each size of print.

```
180 If F$ = "E" THEN C = 14: LL = 15: GOTO 220
190 If F$ = "S" THEN C = 15: LL = 30: GOTO 220
200 If F$ = "C" THEN C = 15: LL = 60: GOTO 220
```

Alter the value for LL in each line to modify the program to accommodate wider or narrower labels.

## PRINTING RECIPES

Another way to use your Epson printer for organizing your kitchen is with your recipes. Some homemakers type their recipes, others write them, some just cut them out of the newspaper and stuff them into a drawer. Your computer system can help you organize your directions for culinary enchantment.

Here's a program that will print your recipe cards. Recipe Maker gives you the choice of printing them on 3 x 5-inch or 5 x 8-inch index cards. I must confess that the 5 x 8 option is actually written to accommodate a 5½ x 8 sheet so that you can use a half sheet of regular typing paper if you so desire.

You're also given the choice of printing in either standard or compressed mode. Naturally, the compressed mode will fit more letters on a card than the standard mode. If you have a lot to say in your recipes you might want to use the compressed mode on the 5 x 8 cards.

The program is rather self-explanatory. It begins by asking for the name of the recipe. This name will be printed across the top of the card in expanded lettering.

It will then ask for the source of this recipe. This is so you may give credit (or blame) where it is properly due. Enter the name of the donor and it will be printed directly below the recipe's name as "From the Kitchen of:".

Having completed the formalities, you may begin to enter the list of ingredients. Include both the measurement and name of the actual ingredient, i.e., ½ tsp. dried parsley. These ingredients will be listed before the instructions in two columns. This means that there is a limit to the length allowed for each ingredient. If you happen to input an ingredient that is too long, it will display a message indicating so and give you another chance.

Signal that you have completed entering your list of ingredients by pressing only RETURN when asked for the next ingredient. This will tell the program that you are ready to begin with your instructions.

Now enter each of your steps in order. The numeric prompt will appear and you need only follow it with the appropriate instruction. Each instruction may be up to 150 lines in length.

Press the RETURN key again at the prompt, when you have completed entering your instructions. This will cause the program to ask if you wish to change any of your instructions. If you answer "Y" it will then ask for the number of the step to be modified. Enter that number and you'll be given another chance.

Upon completing the input for that recipe, you'll be asked how many copies you wish to print. Since you'll probably be printing them on index cards, it will pause between cards to allow you to prepare the printer. Line up each card with the top of the printhead and on the left margin. You may want to try a couple of cards to see how you like their positioning.

This program does not save the recipes to diskette. It is only meant to provide you with a quick and easy way to fill your recipe file box. If you know anything about programming it would not be too difficult to modify your program to give it the capability to save the recipes in a file on diskette or cassette tape.

```

10 REM SAVE "D1:RECIPES"
20 REM * * PRINTS RECIPE CARDS
30 DIM I1$(75),I2$(75),I3$(75),I4$(75),I5$(75),I6$(75), I7$(75),I8$(75),I9$(75),I10$(75)
40 DIM N1$(150),N2$(150),N3$(150),N4$(150),N5$(150),N6$(150),N7$(150),
N8$(150),N9$(150),N10$(150)
50 DIM F$(50),I$(75),L$(50),N$(150),R$(50),T$(1),Z$(1)
100 PRINT CHR$(125)
110 POSITION 10,2:PRINT "THE RECIPE PRINTER"
120 PRINT :PRINT "THIS PROGRAM WILL PRINT YOUR FAVORITE"
130 PRINT " RECIPES ON 3X5 OR 5X8-INCH CARDS."
140 PRINT :PRINT "YOU ALSO HAVE THE CHOICE TO PRINT IN"
150 PRINT " STANDARD OR COMPRESSED PRINT."
160 PRINT :PRINT "JUST RELAX AND FOLLOW THE INSTRUCTIONS"
170 PRINT "YOUR ATARI COMPUTER AND EPSON PRINTER"
180 PRINT " WILL HELP YOU COOK UP A STORM!'"
190 GOSUB 1000
200 POSITION 4,2:PRINT "WOULD YOU LIKE TO USE:"
210 POSITION 8,4:PRINT "1) 3 X 5-INCH CARDS"
220 POSITION 8,6:PRINT "2) 5 X 8-INCH CARDS"
230 POSITION 16,9:INPUT C
240 IF C<1 OR C>2 THEN 230
250 POSITION 4,12:PRINT "WOULD YOU LIKE TO PRINT IN:"
260 POSITION 8,14:PRINT "C) COMPRESSED TYPE SIZE"
270 POSITION 8,16:PRINT "S) STANDARD TYPE SIZE"
280 POSITION 16,19:INPUT T$
290 IF T$="C" OR T$="S" THEN 300
295 GOTO 280
300 IF C=1 AND T$="C" THEN L=46:LL=2*L:WW=15
310 IF C=1 AND T$="S" THEN L=46:LL=L:WW=15
320 IF C=2 AND T$="C" THEN L=76:LL=2*L:WW=25
330 IF C=2 AND T$="S" THEN L=76:LL=L:WW=25
340 PRINT CHR$(125)
350 R$="": F$=""
360 POSITION 1,2:PRINT "RECIPE NAME: ";:INPUT R$
370 IF LEN(R$)>L/2 THEN TL=INT(L/2):GOSUB 1200:GOTO 360
380 POSITION 1,4:PRINT "FROM THE KITCHEN OF: ";:INPUT F$
390 IF LEN(F$)>L-21 THEN TL=L-21:GOSUB 1200:GOTO 380
400 PRINT :PRINT " ARE THESE CORRECT (Y/N) ";:INPUT Z$
410 IF Z$="Y" THEN 460
420 GOTO 340
460 POSITION 13,9:PRINT "INGREDIENTS"
470 PRINT :PRINT "ENTER YOUR INGREDIENTS:"
480 PRINT "(TOTAL OF 10 ITEMS ALLOWED)"
500 PRINT :PRINT "#1 ";:INPUT I1$:IF I1$="" THEN 600
505 IF LEN(I1$)>((LL-2)/2) THEN TL=((LL-2)/2):GOSUB 1200
510 PRINT :PRINT "#2 ";:INPUT I2$:IF I2$="" THEN 600
515 IF LEN(I2$)>((LL-2)/2) THEN TL=((LL-2)/2):GOSUB 1200
520 PRINT :PRINT "#3 ";:INPUT I3$:IF I3$="" THEN 600
525 IF LEN(I3$)>((LL-2)/2) THEN TL=((LL-2)/2):GOSUB 1200
530 PRINT :PRINT "#4 ";:INPUT I4$:IF I4$="" THEN 600
535 IF LEN(I4$)>((LL-2)/2) THEN TL=((LL-2)/2):GOSUB 1200
540 PRINT :PRINT "#5 ";:INPUT I5$:IF I5$="" THEN 600
545 IF LEN(I5$)>((LL-2)/2) THEN TL=((LL-2)/2):GOSUB 1200
550 PRINT :PRINT "#6 ";:INPUT I6$:IF I6$="" THEN 600
555 IF LEN(I6$)>((LL-2)/2) THEN TL=((LL-2)/2):GOSUB 1200
560 PRINT :PRINT "#7 ";:INPUT I7$:IF I7$="" THEN 600
565 IF LEN(I7$)>((LL-2)/2) THEN TL=((LL-2)/2):GOSUB 1200
570 PRINT :PRINT "#8 ";:INPUT I8$:IF I8$="" THEN 600
575 IF LEN(I8$)>((LL-2)/2) THEN TL=((LL-2)/2):GOSUB 1200
580 PRINT :PRINT "#9 ";:INPUT I9$:IF I9$="" THEN 600
585 IF LEN(I9$)>((LL-2)/2) THEN TL=((LL-2)/2):GOSUB 1200
590 PRINT :PRINT "#10 ";:INPUT I10$:IF I10$="" THEN 600
595 IF LEN(I10$)>((LL-2)/2) THEN TL=((LL-2)/2):GOSUB 1200
600 PRINT :PRINT "ARE THESE CORRECT (Y/N) ";:INPUT Z$
610 IF Z$="Y" THEN 660
620 PRINT :PRINT "WHICH NUMBER NEEDS CORRECTING ";:INPUT Q
630 PRINT :PRINT " #",Q::INPUT I$
631 IF Q=1 THEN I1$=I$
632 IF Q=2 THEN I2$=I$

```

```

633 IF Q=3 THEN I3$=I$
634 IF Q=4 THEN I4$=I$
635 IF Q=5 THEN I5$=I$
636 IF Q=6 THEN I6$=I$
637 IF Q=7 THEN I7$=I$
638 IF Q=8 THEN I8$=I$
639 IF Q=9 THEN I9$=I$
640 IF Q=10 THEN I10$=I$
650 GOTO 600
660 PRINT CHR$(125)
670 POSITION 12,2:PRINT "INSTRUCTIONS"
680 PRINT :PRINT "ENTER STEPS FOR PREPARING YOUR RECIPE"
690 PRINT "(TOTAL OF 10 STEPS ALLOWED)"
700 PRINT :PRINT "#1: ";:INPUT N1$:IF N1$="" THEN 810
705 IF LEN(N1$)>LL THEN TL=LL:GOSUB 1350
710 PRINT :PRINT "#2: ";:INPUT N2$:IF N2$="" THEN 810
715 IF LEN(N2$)>LL THEN TL=LL:GOSUB 1350
720 PRINT :PRINT "#3: ";:INPUT N3$:IF N3$="" THEN 810
725 IF LEN(N3$)>LL THEN TL=LL:GOSUB 1350
730 PRINT :PRINT "#4: ";:INPUT N4$:IF N4$="" THEN 810
735 IF LEN(N4$)>LL THEN TL=LL:GOSUB 1350
740 PRINT :PRINT "#5: ";:INPUT N5$:IF N5$="" THEN 810
745 IF LEN(N5$)>LL THEN TL=LL:GOSUB 1350
750 PRINT :PRINT "#6: ";:INPUT N6$:IF N6$="-" THEN 810
755 IF LEN(N6$)>LL THEN TL=LL:GOSUB 1350
760 PRINT :PRINT "#7$ ";:INPUT N7$:IF N7$="" THEN 810
765 IF LEN(N7$)>LL THEN TL=LL:GOSUB 1350
770 PRINT :PRINT "#8$ ";:INPUT N8$:IF N8$="" THEN 810
775 IF LEN(N8$)>LL THEN TL=LL:GOSUB 1350
780 PRINT :PRINT "#9$ ";:INPUT N9$:IF N9$="" THEN 810
785 IF LEN(N9$)>LL THEN TL=LL:GOSUB 1350
790 PRINT :PRINT "#10$ ";:INPUT N10$:IF N10$="" THEN 810
795 IF LEN(N10$)>LL THEN TL=LL:GOSUB 1350
810 PRINT :PRINT "ARE THESE CORRECT (Y/N) ";:INPUT Z$
815 IF Z$="Y" THEN 860
820 PRINT :PRINT "WHICH NUMBER NEEDS CORRECTING ";:INPUT Q
830 PRINT :PRINT " #";Q:INPUT N$
831 IF Q=1 THEN N1$=N$
832 IF Q=2 THEN N2$=N$
833 IF Q=3 THEN N3$=N$
834 IF Q=4 THEN N4$=N$
835 IF Q=5 THEN N5$=N$
836 IF Q=6 THEN N6$=N$
837 IF Q=7 THEN N7$=N$
838 IF Q=8 THEN N8$=N$
839 IF Q=9 THEN N9$=N$
840 IF Q=10 THEN N10$=N$
850 GOTO 810
860 PRINT CHR$(125)
870 POSITION 7,4:PRINT "PREPARE YOUR EPSON PRINTER"
880 POSITION 13,6:PRINT "FOR PRINTING"
885 PRINT :PRINT "PRESS RETURN TO START PRINTING";:INPUT Z$
890 LPRINT CHR$(14);R$
900 LPRINT "FROM THE KITCHEN OF: ";F$:LPRINT
905 IF T$="C" THEN LPRINT CHR$(15)
905 LPRINT I1$;CHR$(32);CHR$(32);I6$
910 LPRINT I2$;CHR$(32);CHR$(32);I7$
915 LPRINT I3$;CHR$(32);CHR$(32);I8$
920 LPRINT I4$;CHR$(32);CHR$(32);I9$
925 LPRINT I5$;CHR$(32);CHR$(32);I10$
930 LPRINT "#1: ";N1$
935 LPRINT "#2: ";N2$
940 LPRINT "#3: ";N3$
945 LPRINT "#4: ";N4$
950 LPRINT "#5: ";N5$
955 LPRINT "#6: ";N6$
960 LPRINT "#7: ";N7$
965 LPRINT "#8: ";N8$
970 LPRINT "#9: ";N9$
975 LPRINT "#10: ";N10$
980 PRINT :PRINT "DO YOU WANT TO PRINT THIS AGAIN (Y/N)";:INPUT Z$

```

```

985 IF Z$="Y" THEN 860
990 PRINT :PRINT "WANT TO PRINT ANOTHER RECIPE (Y/N)";:INPUT Z$
995 IF Z$="Y" THEN PRINT CHR$(125):GOTO 200
998 PRINT :PRINT :PRINT "    KEEP COOKIN'. . . HOT STUFF!!!"
999 END
1000 POSITION 8,21:PRINT "PRESS RETURN TO CONTINUE";
1010 INPUT Z$
1020 PRINT CHR$(125)
1030 RETURN
1200 PRINT :PRINT "    TOO LONG. ";TL;:PRINT " CHARACTERS MAXIMUM."
1210 RETURN

```

**Figure 6.2 Listing of The Recipe Maker**

---

## RECIPES ON A DATABASE

If you have an "all-electric" kitchen, you may want to build an "electronic recipe box" through the use of a database. A database recipe box will increase the speed with which you can find recipes for a certain type of food or which take a certain amount of time to prepare. With some databases, you can even have your computer help you calculate how to triple a recipe for those large crowds.

Any database can be used for the application I will be describing. "The Atari Home Manager" by Atari Inc., HomePak by Batteries Included, or Syn-File by Synapse Software will all accommodate your recipe database quite nicely.

## GETTING IN FORM

The first thing you'll need for your electronic recipe box is a form. Figure 6.3 shows a form for recipes which I have used successfully. The form doesn't take much explanation except for a few points.

- 1) Use the Main Ingredient field to indicate what type of food is used in this recipe-chicken, pasta, salad, etc.
- 2) Indicate the preparation time in minutes. This means that a recipe taking 1 1/4 hours to prepare should be considered a 75minute recipe.
- 3) Include only one ingredient on each of the numbered lines under Ingredients.
- 4) Enter only one step on each of the numbered Instruction lines.

---

Recipe title:

Main ingredient:

Preparation time (minutes):

Number of people served:

Ingredients

#1:        #7:

#2:        #8:

#3:        #9:

#4:        #10:

---

#5:      #11:

#6:      #12:

Instructions

Step 1:

Step 2:

Step 3:

Step 4:

Step 5:

Step 6:

Step 7:

Step 8:

### **Figure 6.3 Sample Recipe Form for Data Base**

---

Once you have entered a number of recipes into your database, you'll begin to understand how it can make your life in the kitchen easier. How many times have you wanted to cook a new chicken dish but used an old standby because you didn't want to spend the time paging through your recipe books to find a new one? With your recipes on a database, you can let your computer do the looking.

Ask the database to find all of the recipes which have chicken as the main ingredient. It will find all of them in a few seconds and display them for your examination. If you have only a limited amount of time for cooking, ask it to find all of the recipes for chicken which have a preparation time of 30 minutes or less.

Once you've found the recipe you want, you can either print it out on your Epson printer or, if you have a monitor in the kitchen, you can just read it off of the screen.

Using a computer in your kitchen can make life easier and more efficient. Imagine constructing your weekly menu on your word processor, then printing your shopping list out (in order of store aisle) on your Epson printer. When you get home, you can access the recipe for the night using your electronic recipe box. After dinner you can label the leftovers using the Label Maker program from this chapter. What an electronic life.

The same sort of convenience can be found when doing your home finances. The next chapter will explain how you can computerize your checkbook.

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)



---

## Chapter 7

---

# Home Finances on the Epson Printer

One of the most frequently used justifications for buying a home computer system is to manage family finances. Big businesses use computers for managing payroll and cash flow, why not use it for keeping track of the weekly paycheck and its various channels of distribution?

Why not, indeed. Your Atari computer and Epson printer can be programmed to handle your home accounts like a regular CPA firm. They can separate your debits from your credits and your income from your out-go. The potential for your computer team is almost endless.

Sounds like the answer to all financial woes, doesn't it? It's only fair to warn you that a computer system won't necessarily straighten-up your unbalanced checkbook. If you're unorganized with your finances now, the computer won't fix it. It might even make things worse. Think of how much it cost in the first place.

What your computer can do, however, is make you concentrate on your organization techniques. If you're like many people, you would like to straighten up your financial situation but you just can't seem to get a handle on it. A financial computer program can give you the structure you need to start on the way to financial recovery.

When the financial program comes from the store, it doesn't already contain your financial specifics. You have to enter them. This means that you must find all of those pay stubs, receipts, and bank statements. You must organize them and enter them into the proper categories. Your computer system can work as your financial organizer by simply asking the necessary questions and leaving the rest up to you.

This chapter includes some BASIC programs that will print checks and figure mortgage payments. You will also be introduced to using a spreadsheet with a couple of applications that will tally your checkbook and run your monthly budget. There are full accounting packages available to run on the Atari computer but they are much more complicated than can be covered in these few pages.

### THE CHECKWRITER

Many people like to type their monthly checks because of the professional appearance it gives them. The CheckWriter produces checks with that "finished" appearance but also provides the advantage of word processing when it comes to correcting mistakes.

Upon booting-up the program, you will be asked for the date of the check. Enter the month, date, and year on separate lines next to the prompts. This will be the only time you'll be asked for the date since all of the checks you write at one sitting will have the same date.

Enter the check recipient, check amount (no dollar signs) and the check classification. The check classification will be printed in the lower-left corner of your check and makes tracking your flow of out-going money easier.

Now it's time to print your check. If your Epson printer is equipped with friction feed capability, you won't have to use checks designed for computers. You can print single checks or three-check sheets directly out of your desktop checkbook. If your printer doesn't have a platen or you'll be printing lots of checks, you might want to investigate continuous form-feed checks that are sprocketed to help them feed through your printer smoothly.

Align the top of the check with your print head. There's nothing magic about the print head position, but it gives a constant frame of reference to ensure that each check starts from the same position.

Press RETURN and your Epson printer will start clattering. The date, recipient, and check amount are printed on the first couple of lines. The next line is where the cash amount must be written out in words. You'll recall that you didn't type this in. The program names each of the digits in the amount to produce a written number. Finally, the check classification is printed in the lower-left corner.

Sorry, you have to sign your own checks.

Your check is then ejected from the printer or advanced to the top of the next check, depending upon the format of checks you're using. This makes it easier to move from one check to the next.

---

```
10 REM SAVE "D1:CHECKWRT"
30 DIM A$(1),D$(2),CA$(9),CC$(14),CR$(25)
40 DIM M$(10),Y$(4),CD$(1),CN$(6)
100 PRINT CHR$(125)
110 POSITION 11,1:PRINT "YOUR CHECKWRITER"
130 POSITION 1,4:PRINT "PLEASE ANSWER THESE QUESTIONS:"
140 PRINT "      (USE NO COMMAS)"
150 POSITION 1,7:PRINT "MONTH (I.E., JULY): ";:INPUT M$
160 PRINT "DATE (I.E., 14): ";:INPUT D$
170 PRINT "YEAR (I.E., 1985): ";:INPUT Y3
180 PRINT :PRINT "CHECK RECIPIENT: ";:INPUT CR$
190 PRINT :PRINT "CHECK AMOUNT (I.E., 127.14): ";:INPUT CA$
200 PRINT :PRINT "CHECK CLASSIFICATION: ";:INPUT CC$
210 PRINT :PRINT "      PLEASE PREPARE YOUR PRINTER"
220 PRINT "      ALIGN TOP OF CHECK WITH PRINTHEAD"
230 PRINT :PRINT "      PRESS RETURN TO CONTINUE";
240 INPUT A$
250 OPEN #1,8,0,"P:"
260 FOR Q=1 TO 3:PRINT #1;:NEXT Q
270 DD=LEN(M$)+LEN(D$)+1
280 FOR Q=1 TO 45-DD:PRINT #1;" ",:NEXT Q:PRINT #1;M$;" ";D$;
290 PRINT #1;"      ";Y$(3,4)
300 FOR Q=1 TO 1:LPRINT :NEXT Q
305 M=45-LEN(CR$)
310 PRINT #1,CR$;:FOR Q=1 TO M:PRINT #1;" ";:NEXT Q:PRINT #1;CA$
320 FOR Q=1 TO 1:LPRINT :NEXT Q
330 PRINT #1;"      ";:GOSUB 430
340 FOR Q=1 TO 3:LPRINT :NEXT Q
350 FOR Q=1 TO 5:PRINT #1;" ".:NEXT Q:PRINT #1;CC$
360 CLOSE #1
370 FOR Q=1 TO 2:LPRINT :NEXT Q
390 PRINT :PRINT "WRITE ANOTHER CHECK (Y/N)";:INPUT A$
410 IF A$="Y" THEN 100
420 PRINT CHR$(125):POSITION 4,7:PRINT "IT'S BEEN NICE PRINTING WITH YOU"
427 END
430 FOR D=1 TO LEN(CA$)-3
440 CD$=CA$(D,D)
450 IF CD$="0" THEN CN$="ZERO"
460 IF CD$="1" THEN CN$="ONE"
470 IF CD$="2" THEN CN$="TWO"
480 IF CD$="3" THEN CN$="THREE"
490 IF CD$="4" THEN CN$="FOUR"
500 IF CD$="5" THEN CN$="FIVE"
510 IF CD$="6" THEN CN$="SIX"
520 IF CD$="7" THEN CN$="SEVEN"
530 IF CD$="8" THEN CN$="EIGHT"
540 IF CD$="9" THEN CN$="NINE"
550 PRINT #1;CN$;
560 IF D<LEN(CA$)-3 THEN PRINT #1;"-";
570 NEXT D
580 PRINT #1;" DOLLARS & "
590 PRINT #1;CA$(LEN(CA$)-1,LEN(CA$));"/CENTS"
600 RETURN
```

**Figure 7.1 Program Listing of The CheckWriter**

---

## HOW TO MODIFY THE CHECKWRITER

The styles of checks vary as much as the banks who print them. Because of this, the CheckWriter may not exactly fit the format of your checks. This potential problem made it necessary for me to write the CheckWriter program so as to make modification quick and easy.

The first place you might want to modify is the vertical location of the lines on the check.

```
340 FOR Q = 1 TO 3 : PRINT#1, : NEXT Q
```

Line 340 advances the check three lines between writing the check amount and the check classification. If your checks require more or less lines between printings, simply change the value of 3. This is the same with lines 260, 300, 320, 340 and 370 which also control the advances of the printer.

You can also change the horizontal placement of numbers or words by altering the number of spaces the printhead moves to the right before printing. Lines 280, 310, and 350 use a FOR - NEXT loop to move the head horizontally. Alter the numbers on these lines to customize the program to print on your specific checks.

The CheckWriter can be a very useful program. It is lacking a way to monitor your checks, however. This is easily remedied by the check tally on a spreadsheet which follows.

## USING A SPREADSHEET

One of the greatest boons to business was the advent of the electronic spreadsheet. It is an electronic form of the spreadsheet that has been used by accountants for centuries. Using formulas to automatically calculate the relationships between columns of numbers, the electronic spreadsheet can enable a single person to do a business forecast in a couple days that which used to take a team of accountants months to complete.

There are a number of spreadsheets available for the Atari computer. For the sake of explanation here, I will be using VisiCalc by VisiCorp. This program is the Granddaddy of spreadsheets and has been well adapted for the Atari computer line.

I can't expect to teach you how to use a spreadsheet in these few pages; whole books are devoted to doing that. I will, however, try to cover enough to help you input the applications covered in this chapter and Chapter 12.

When you boot your disk, the spreadsheet will appear on the screen. VisiCalc extends 63 columns across and 254 rows down. There are letters at the top of each of the columns and numbers running down the side to label the rows. Not all of it will fit on the screen at once. Think of your screen as a "window" which displays a small portion of the spreadsheet.

The spreadsheet is composed of a number of squares. Each square is called a "cell." It is named as the intersection of a column and a row. The cell in the upper-left corner is named A1. This indicates that it is in column A and row 1. The cell that is down two rows and over three columns is D3. That's the D column and number 3 row.

You can move between these cells in a couple of ways. Using the cursor control keys you can move the black cursor from cell to cell. Put down the book and try this a couple of times.

You can also move by pressing the > key. The words GOTO will display in the upper-right corner of your screen. Here you type the coordinates of your destination cell. Upon pressing RETURN, your cursor block will immediately jump to the desired cell. Let's jump to cell D3.

Once you reach D3, there are three types of entries that can be made:

- 1) Value,
- 2) Label, and
- 3) Formula.

A Value is a number. It is entered by just typing in the number and hitting RETURN. It has value and can be used for calculations. As you're entering your value, the word "Value" will appear on the Status Line in the upper-left corner.

A Label is a string of words. It cannot be used for calculations. To enter a Label, just start typing. The alphabetical nature of the first letter will cause "Label" to appear in the upper left corner. If your first character is a space or some other non-alphabetical symbol, you must indicate to your computer that it is a Label by preceeding your line with a set of quotation marks or you forgot to press the space bar before entering your Label. Check the status line and correct if necessary.

The last type of entry is the Formula. This is a kissing cousin of the Value. In fact, as you enter a Formula, VisiCalc will actually show it to be a Value on the status line. A simple Formula might read "+B3 + C3." This tells VisiCalc to add the values in cells B3 and C3 and place the sum in the cell where this formula is entered.

The + sign at the beginning of the Formula tells VisiCalc that the string of characters is a Formula.

Although this is only giving you a glimpse of how a spreadsheet works, it should be enough to help you enter the Check Tally application. I will explain more information as more skills are needed along the way.

## THE CHECK TALLY

You'll have to keep track of the checks you write with the Check Writer program. To do this, I am including a spreadsheet application called "The Check Tally." This is both an effective way to keep track of your checks and an easy introduction to the workings of a spreadsheet.

This Check Tally application is also known as a "template." It's called a template because it's laid over your spreadsheet program to make the spreadsheet fit your needs.

I will be using conventional spreadsheet notations to explain what to enter in the cells of your spreadsheet. Each entry will be preceded by a ">", a letter-number combination indicating the cell location, and a colon. The data following the colon is the data which needs to be entered into the cell.

You must move the cursor to a cell before you can enter a Value, Formula, or Label into that cell. You can move the cursor around your spreadsheet by either using the cursor-control keys or the GOTO command. The GOTO command is entered through the use of the > sign. After pressing >, the words "GOTO" appear on the status line at the top of the screen and you can input the coordinates of the cell to which you wish to move.

When you have input the coordinates for the destination cell, press RETURN and your cursor will jump to that cell. In this notation, I will use the colon (:) to indicate pressing the RETURN key.

Once you have reached your desired cell, type the entry listed to the right of the colon. Some of the formulas will extend beyond the eight spaces in the cell. That's O.K. A VisiCalc cell will accept a formula up to 35 characters long.

Once your information is entered into the cell, it can be registered with the computer by either moving the cursor to another cell or pressing RETURN. Moving the cursor is usually a faster way to do it because you're going to move to another cell anyway after you press RETURN. Moving the cursor in the first place saves keystrokes.

If you make a mistake, you can use the DELeTe key to remove incorrect characters. If you wish to clear the whole cell, press / and then B, RETURN. This will blank the cell and prepare it for correct input.

I realize that you will want to modify this template to fit your own needs, but I would suggest you follow it exactly to ensure the proper input of the cells and then make your modifications.

VisiCalc uses a standard format for displaying values and labels. It displays labels in a left justified manner and values in a right justified format. If either of these styles doesn't fit your needs, you can select one of VisiCalc's other formats through which your information can be displayed. Begin by pressing the / key to show the System Menu across the top of the screen. Next press "F" to display the Format Menu. Select one of the letters in the Format Menu. VisiCalc uses \$ for currency format, L for left justified, and R for right justified.

```
>A1:" Leigh's
>B1:" Checks f
>C1:" for May
>A3:" Opening
>B3:Balance:
>C3:/F$
>E3:/F$ @Sum(E8.E39)
>F3:/F$ @ Sum(F8.F39)
>A4:" Current
>B4:Balance:
>C4:/F$ + C3 - @SUM(E&E39) + @SUM(F8.F39)
>A6:" Check #
>B6:" Date
>C6:" Reci
>D6:pient
>E6:Withdraw
>F6:" Deposit
>G6:" Balance
>H6:" Group
>A8:/FL
>E8:/F$
```

>F8:/F\$  
>G8:+C3-E8+F8  
>H8:/F\$  
>A9:/FL + A8 + 1  
>G9:+G8-E9+F9

## DOIN' IT AGAIN

Now it's time to replicate. You will prepare your Check Tally for 32 checks. This allows you one a day and one or two for foolishness. (Just think, February can be an extremely foolish month.) The only problem is that each check number must be entered separately.

T'aint necessarily so. You'll remember that you typed in a formula, + A8 + 1, in cell A9. This says to add one to the number in cell A8. If your first check is numbered 2000 and you enter it in A8, A9 will immediately display 2001 in preparation for the second check.

This same formula can be used all the way down column A to compute sequential check numbers. What's that you say? Typing in the formula is more work than the number? Fortunately your VisiCalc spreadsheet includes a Replicate command to duplicate the formula throughout column A.

The replicate command enables you to designate a source cell or block of cells from which you wish to copy information. You then designate a target cell or block of cells to which you wish the information copied. This procedure is a grand time saver when there is repetitive information to be entered as you will see.

Begin the replication process by moving the cursor to A9. This is the cell from which you want to copy the formula. Now press /. The System Menu will display across the top of the screen. Press R to enter the Replicate mode.

The top of your screen now shows A9 at the beginning of the line. This is the beginning of the Source Range. Press RETURN to accept this value and enter the end of the Source Range as A9 also. Next type A10 as the first cell of the Target Range. Press the Period key (.) and a series of three dots will follow the A10 on your screen. Enter A40 and you should see

A9 ... A9: A10...A40

Press RETURN and the formula in A9 will begin the replication process down column A. If you've been paying careful attention, you may be wondering why you would want the formula A8 + 1 in each of the cells in column A. This would mean that they would all display a number that is one greater than the quantity in A8. You don't want all of the cells to add one to A8, but you do want each of them to add one to the cell above them. You want each cell to exhibit a similar formula which is relative to its position.

After pressing RETURN this last time, the top of the screen changed to display a question, "REPLICATE: N =NO CHANGE, R =RELATIVE". Doesn't appear to be much of a question, but it's asking whether you want the variable A8 (displayed on the next line) to be copied in an absolute (no change) or relative form. An absolute form would mean that A8 would be inserted into each of the cells. Relative form means the variable A8 would be adjusted to indicate cells in the same relative position as A8 is to A9.

Press R for relative.

VisiCalc will now enter those formulas in each of the cells. When it is completed, a series of red ERROR statements will appear down the left side of your worksheet. These ERROR messages indicate that these equations do not have enough information to work. Move to cell A8 and enter 2000. Press RETURN and watch what happens.

Hopefully, you now have a set of sequential check numbers running down the left side of your spreadsheet. If not, review the instructions to see if you forgot anything.

You'll now use the replicate command in columns F, G, and H. Column F needs to have 0 (zero) entered in each of its cells to provide enough information for the equations in Column G. Column G needs the equation for computing the balance copied in all of its cells. Columns E and H will use the replicate command to copy the format into each of the cells.

Column F:           Enter 0 (zero) in F8  
                      /R:F9.F40:

Column G:           >G9:  
                      /R:G10.G40:  
                      Relative (G8)

|           |                    |
|-----------|--------------------|
|           | Relative (E9)      |
|           | Relative (F9)      |
| Column E: | >E8:<br>/R:E9.E40: |
| Column H: | >E8:<br>/R:H9.H40: |

Your Check Tally is now ready to manipulate information. Using the model sheet in Figure 7.3, enter the Opening Balance. Do this by moving to cell C3 and then entering 500. Now continue to use the model sheet to enter the Date, Recipient, and Amount (Withdraw), and Group of each check.

Don't enter the deposits. As you enter your withdrawals, you'll notice your account will start showing a negative balance. Don't worry about it. You'll soon be making some deposits to offset your scarcity of resources.

Let me take a moment here to mention something about saving your work to disk or tape. You've completed a great amount of work and if the power were to accidentally fail right now, it would all be lost. Before continuing, save your spreadsheet. Begin by pressing /. Then S for Storage. Select S again for Save. Type in the title of the file in which you wish to save your spreadsheet. Remember, your title must not exceed eight characters. You might name it CHECKBOK.

Now it's time to make some deposits into your account.

## MAKING DEPOSITS

You'll notice deposits have a column but no rows. Each of the rows is preceded by a check number. Deposits tend to be sporadic. They need to be interjected wherever needed. To answer this need, use the Insert command to create an empty row for a deposit.

Move your cursor to row 10. You will insert your \$1500.00 paycheck on this line. Begin by pressing /. Press I for Insert. You will be asked whether you would like to insert a Row or Column. Select Row with the letter R.

Your Atari will spend about 20 seconds moving all of the entries down one row. A blank row will then appear on Row 10. This row is really blank. It contains no numbers, no letters, and, regrettably, no formulas or formats. This means that you will have to enter the formats and formulas where needed on this line.

Enter this information for your deposit:

|         |          |                 |                    |
|---------|----------|-----------------|--------------------|
| A10     | C10      | E10             | F10                |
| Deposit | Paycheck | f7,F,\$<br>0.00 | f7,F,\$<br>1500.00 |

The formula for the Balance column can either be entered manually as  $\text{F\$ G9} - \text{E 10} + \text{F10}$  or the replication process may be used to copy it as a relational formula from cell G9.

You may have noticed a new balance appear after you entered the formula into G10, but none of the other numbers changed. This is because of a slight problem with the formula in G11. Move the cursor down to G11 and inspect the formula. It reads  $\text{G9} - \text{E11} + \text{F11}$ . Notice that it totally disregards the deposit on line 10. The line was inserted but none of the formulas were adjusted accordingly. Correct this by using the replicate command to copy the formula from G10 into G11 as a relational formula.

Add a deposit of your own creation on your Check Tally. Remember to enter the formats and formulas and readjust the formula in G column below the deposit line.

## POSSIBLE PROBLEMS

Spreadsheets are quick and easy. Unfortunately, these attributes can sometimes lull the user into a false sense of security. As you saw with some formulas in column G, problems with formulas aren't always easy to detect. To catch these problems you must include crosschecks on your spreadsheet.

You'll notice in row 3 there are numbers above the Withdraw and Deposit columns. These are the sums of those columns. These sums are located at the top of the columns instead of bottom for easy access.

Along with the sums at the top of the spreadsheet are places for the Opening Balance and Current Balance. There is no calculation done with the Opening Balance. It is typed in from last month's statement. The Current Balance, however, is a checking system for the accuracy of the spreadsheet. Whereas the check-to-check balance is calculated by the formulas in each row, the Current Balance is calculated by subtracting the sum of the withdrawals from the opening balance and then adding the sum of the deposits. It may not always agree with the running balance in column G. If they don't agree, start looking for a problem in one of your formulas in column G.

## PRINTING YOUR CHECKBOOK TALLY

Printing your Checkbook Tally is really quite easy. Begin by moving the cursor to Cell A1 by typing  $\text{>A1}$ : (Remember : indicates RETURN.) Select /. Then P for Print. You will now be given the choice to print the spreadsheet to a File or your Printer. Select I? Your Status Line now displays "Print: Lower right, "Setup, -, &". Begin by telling VisiCalc you want it to send a carriage return and Line Feed at the end of each line. This is accomplished by typing &. & may not appear on the screen, but it's there just the same. Now type H40 to tell VisiCalc the lower right corner of your spreadsheet. Press RETURN and your printer should come to life.

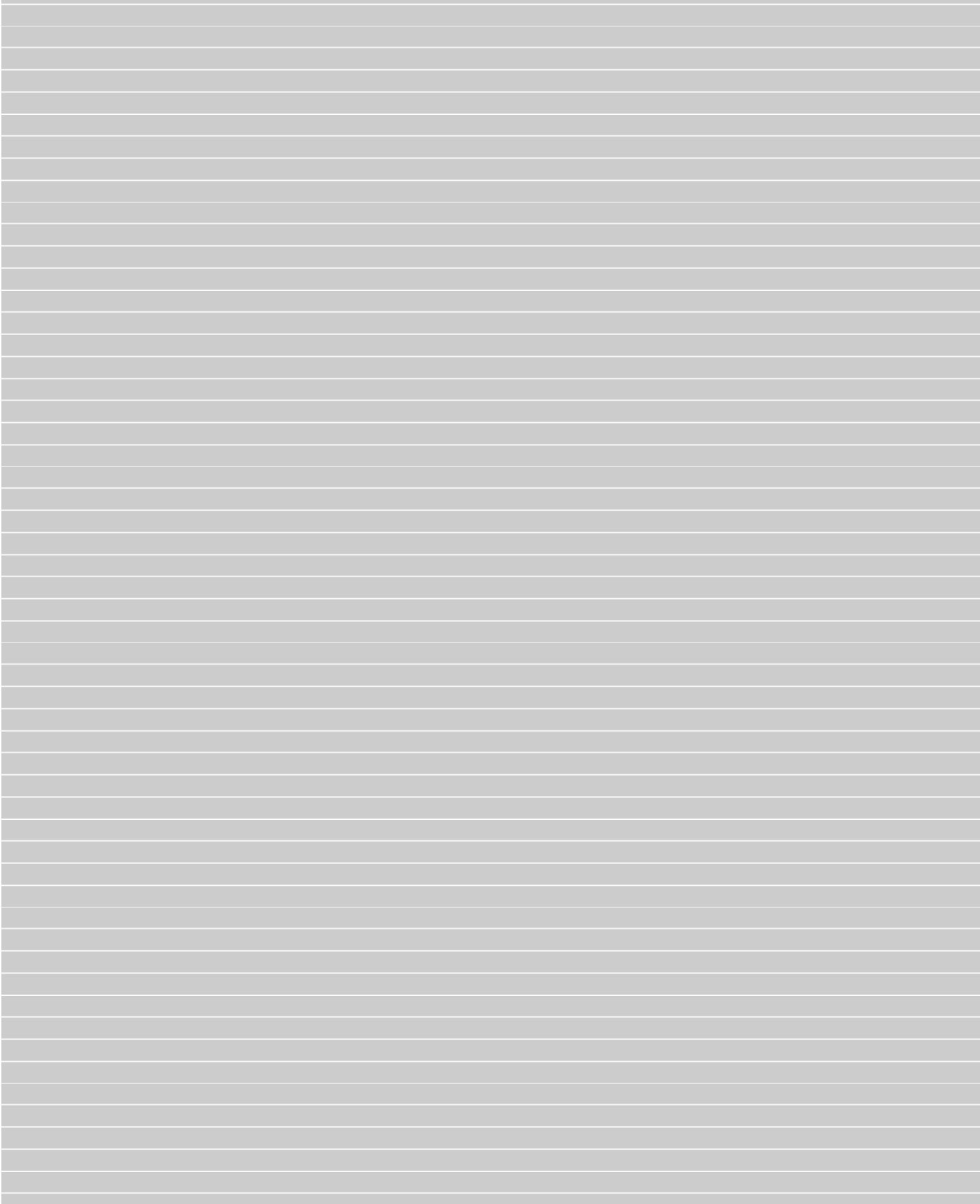
If your Epson printer is equipped with SelecType, you should experiment with the various combinations available for printing your spreadsheet. Printing in Near-Letter Quality will give it a professional appearance. Printing in Compressed Mode should allow you to print up to 130 columns on one page. Experiment and have fun.

You can see how your Atari computer and Epson printer can make your home finances easier to manage. You might even be able to save enough money to buy all of the computer equipment and software you've been dreaming about.

The next section discusses using your computer system for doing better in school. It explains how you can use your Atari computer and Epson printer to produce better assignments and achieve greater mastery over the subject material.

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)



---

## Chapter 8

---

# Getting Better Grades on Your Reports Using Your Epson Printer

You are a person who is interested in excelling. The mere fact that you are reading this book about computers and their applications is proof that you want to be ahead of the rest. You want to keep up with the changing times in order to make them work for you and your advancement.

This chapter is devoted to researching and writing reports. The purpose of a report is to educate. In some cases, like the classroom, a teacher assigns a report to educate the student by prompting him to do in-depth research on a given topic. The teacher then grades the author on his success in researching and conveying the information.

Ask any teacher and he will tell you that academic report writing is assigned to prepare the student for "the real thing." It is directed at teaching a student to procure information and then convey it in a form that is informative and understandable.

Businesses use the report format as a vehicle to educate as well. In business, however, the report is not meant to inform the author. It is meant to inform the reader. It is used to provide the reader with information that may be beneficial to his business situation. It is used to improve the reader's situation.

Either way, the key to producing a successful report lies in sufficient research and effective presentation. A document may be filled with astounding facts but these are meaningless unless they are presented in a manner that is understandable to the reader. Conversely, a report may shine from the glitter and gloss included in its presentation. But without substantial information it is a hollow facade.

The first half of this chapter will discuss ways to use your Atari computer and Epson printer to organize research information. It will present three ways to store the information and then organize it for the report writing. The second half will suggest ways to use your computer system to improve your presentation of your research data. It will show you how to put pizzazz in your presentations.

## RESEARCHING WITH NOTECARDS

The greatest problem in research of any sort is the management of information. As you read through articles and books on the subject, you encounter hundreds of facts about the topic. The big question is what to do with this wealth of information.

Some researchers write down all the facts from a specific article on a single sheet of paper. This is helpful because they know the source of the information. But when it comes time to collate the information, bring it together, and turn it into a finished product, it's quite difficult to take facts from various sources and synthesize them under specific topics.

A more efficient method is to take notes on index cards. This is not to say that all of the facts are crammed onto a small card instead of a sheet of paper. The researcher writes each individual fact on a separate card in this fashion:

---

#### PHILADELPHIA

Philadelphia is known as the "City of Brotherly Love".

Page 320

Resource #1

### Figure 8.1 Notecard

---

This card for a report on Pennsylvania discusses one of its cities, Philadelphia. This is easily recognized by the subheading across the top of the card.

Notice that the information on this card is limited to a single fact. It's necessary for sorting the cards when you're organizing the report. Including more than one fact on a card could cause problems if you decide that the facts should not be included in the same sections of the report. It would be difficult to place the card in two different sections of the cardstack simultaneously.

The bibliographic information is included along the bottom of the card. The page where the fact was found is written in the left corner, and a reference to the resource is written in the right. This reference actually refers to a bibliography card that includes the bibliographic information about the book.

A bibliography card contains the name of the author, the title of the book or article, the publication date and publisher, and the page numbers if it is an article. You will notice on this example card that it is numbered. That is the number included at the bottom of the notecard in Figure 8.1.

---

#### BIBLIOGRAPHY

Clark, Harold. "Philadelphia,"  
World Book Encyclopedia, 1979 ed.,  
p. 320-340.

Resource #1

### Figure 8.2 Bibliography Card

---

When it comes time to organize your newly uncovered facts into a finished product, the notecard method boils the process down to nothing more than sorting and resorting a deck of cards until the structure of the paper is created. The only thing left for you, the writer, is to fill in the skeleton with the meat of conjunctions and adjectives.

Imagine doing a report on Colorado. A notecard for this report might read:

---

#### CAPITAL

The capital of Colorado is Denver.

Page 12

Resource #2

### Figure 8.3 Notecard

---

Imagine that you have a different card for a different source which states:

---

Denver is known as the "Mile-High City" because its elevation is 5,280 feet.

### Figure 8.4 Notecard

---

Each of these cards contains interesting information that can be combined into a single sentence. Instead of having to dig through reams of notes to connect these independent facts, all that the researcher needs to do is group these two cards together to yield a sentence that might read "The capital of Colorado, Denver, is known as the "Mile-High City" because of its 5,280 foot elevation."

To those who have never used the index card method for collecting information, I realize that you may not fully appreciate the savings of time and effort this process will yield. I didn't fully appreciate it either until one time in college when I was preparing a ten-page paper and decided not to use index cards. Instead, I wrote my notes on sheets of notebook paper.

Researching through eight different sources left me with a dozen and a half sheets of paper covered with facts on the play behavior of baboons. When it was time to put my report together, it was an exercise in futility. Organizing was next to impossible. Related facts were strewn throughout the pile of papers. I tried lining them out, color-coding them-nothing worked. Finally, I resorted to cutting the paper into smaller pieces-each containing one fact so that they might be sorted like they were on 3 x 5 cards. On that day I resolved to always use the notecard format for research.

Using the notecard format does not limit one to the medium of pen and paper, however. The computer age has brought upon us several ways in which this way may be made even more efficient. I will describe two ways.

The first way is basically a specialized form of an electronic typewriter. I have included a BASIC program for printing notecards. This is a modification of the Recipe Printer from Chapter 6, but there are enough changes to warrant its reprinting here.

The second way uses a word processor to input your facts. Once entered, you may use the text moving features to organize them into a usable format similar to shuffling a deck of notecards. This provides a structure for the report that is already input into the word processor.

## THE NOTECARD PRINTER

This program is a modification of the Recipe Printer from Chapter 6. It is quite similar in its workings, but it is written specifically for creating notecards for research, including bibliography cards. I actually wrote it by modifying the Recipe Printer program, so if you have already input the Recipe Printer, you will save yourself by simply modifying that program to coincide with the listing in Figure 8.5. This program is designed for those who like to use notecards, but enjoy the advantages of word processing over typing or writing.

Begin by entering the subheading for the card. This will be printed across the card in expanded type.

Now enter your factual information. Remember to limit the scope to a single fact per card. This should limit your input, but if you get talkative-the program will remind you. When you have completed your input of information, press the RETURN key an additional time. This will move you to the next step where you will indicate the page number(s) of your source. After you have entered the page number(s), press RETURN and it will ask you for the number of the bibliography card of your resource.

If you are interested in printing a bibliography card, simply type "B" and press RETURN when you're asked for the heading of the card. This will automatically enter the title of BIBLIOGRAPHY and then ask you to enter the bibliographic information along with the reference number for this card.

When you have completed inputting your information, press RETURN an additional time and you may begin printing. Lineup the top of your index card or paper with the print head on your Epson printer. This should position the information rather well, but you may want to adjust them to suit your tastes. After printing a card, you will be given the option to print that card again or printing another. Answering "N" to both questions will allow you to exit the program.

---

```

10 REM SAVE"D1:NOTECARD"
20 REM * * PRINTS NOTECARDS * *
30 DIM N1$(150),N2$(150),N3$(150),N4$(150),N5$(150)
40 DIM N6$(150),N7$(150),N8$(150),N9$(150),N10$(150)
50 DIM F$(50),I$(75),L$(50),N$(150),R$(50),T$(1),Z$(1)
100 PRINT CHR$(125)
110 POSITION 8,2:PRINT "THE NOTECARD PRINTER"
120 PRINT :PRINT "THIS PROGRAM WILL PRINT YOUR RESEARCH"
130 PRINT " NOTECARDS ON 3X5-INCH CARDS."
140 PRINT :PRINT "YOU ALSO HAVE THE CHOICE TO PRINT IN"
150 PRINT " STANDARD OR COMPRESSED PRINT."
160 PRINT :PRINT "JUST RELAX AND FOLLOW THE INSTRUCTIONS"
170 PRINT "YOUR ATARI COMPUTER AND EPSON PRINTER"
180 PRINT " WILL HELP YOU MANAGE THOSE FACTS'"
190 GOSUB 1000
200 PRINT CHR$(125)
250 POSITION 4,2:PRINT "WOULD YOU LIKE TO PRINT IN:"
260 POSITION 8,4:PRINT "C) COMPRESSED TYPESIZE"
270 POSITION 8,6:PRINT "S) STANDARD TYPESIZE"
280 POSITION 16,9:INPUT T$
290 IF T$="C" OR T$="S" THEN 300
295 GOTO 280
300 IF T$="C" THEN L=46:LL=2*L:WW=15
310 IF T$="S" THEN L=46:LL=L:WW=15
340 PRINT CHR$(125)
345 R$="":F$=""
350 N1$="":N2$=" ":N3$=" ":N4$="":N5$=""
355 N6$="":N7$="":N8$="":N9$="":N10$=""
360 POSITION 1,2:PRINT "SUBHEADING: "
370 PRINT "(TYPE B FOR BIBLIOGRAPHY) ";:INPUT R$
375 IF R$="B" THEN R$="BIBLIOGRAPHY"
380 IF LEN(R$)>23 THEN GOSUB 1200:GOTO 380
390 IF LEN(F$)>L-21 THEN TL=L-21:GOSUB 1200:GOTO 380
400 PRINT :PRINT " ARE THESE CORRECT (Y/N) ";:INPUT Z$
410 IF Z$="Y" THEN 660
420 GOTO 340
660 PRINT CHR$(125)
680 PRINT :PRINT "ENTER THE FACT FOR THIS CARD:"
690 PRINT "(TOTAL OF 10 LINES ALLOWED)"
700 PRINT :PRINT "#1: ";:INPUT N1$:IF N1$="" THEN 810
705 IF LEN(N1$)>LL THEN TL=LL:GOSUB 1200
710 PRINT :PRINT "2: ";:INPUT N2$:IF N2$="" THEN 810
715 IF LEN(N2$)>LL THEN TL=LL:GOSUB 1200
720 PRINT :PRINT "#3: ";:INPUT N3$:IF N3$="" THEN 810
725 IF LEN(N3$)>LL THEN TL=LL:GOSUB 1200
730 PRINT :PRINT "#4: ";:INPUT N4$:IF N4$="" THEN 810
735 IF LEN(N4$)>LL THEN TL=LL:GOSUB 1200
740 PRINT :PRINT "#5: ";:INPUT N5$:IF N5$="" THEN 810
745 IF LEN(N5$)>LL THEN TL=LL:GOSUB 1200
750 PRINT :PRINT "#6: ";:INPUT N6$:IF N6$="" THEN 810
755 IF LEN(N6$)>LL THEN TL=LL:GOSUB 1200
760 PRINT :PRINT "#7: ";:INPUT N7$:IF N7$="" THEN 1310
765 IF LEN(N7$)>LL THEN TL=LL:GOSUB 1200
770 PRINT :PRINT "#8: ";:INPUT N8$:IF N8$="" THEN 1310
775 IF LEN(N8$)>LL THEN TL=LL:GOSUB 1200
780 PRINT :PRINT "#9: ";:INPUT N9$:IF N9$="" THEN 1310
785 IF LEN(N9$)>LL THEN TL=LL:GOSUB 1200
790 PRINT :PRINT "#10: ";:INPUT N10$:IF N10$="" THEN 810
795 IF LEN(N10$)>LL THEN TL=LL:GOSUB 1200
810 PRINT :PRINT "ARE THESE CORRECT (Y/N) ";:INPUT Z$
815 IF Z$="Y" THEN 852
820 PRINT :PRINT "WHICH NUMBER NEEDS CORRECTING ";:INPUT Q
830 PRINT :PRINT "#";Q;:INPUT N$
831 IF Q=1 THEN N1$=N$
832 IF Q=2 THEN N2$=N$
833 IF Q=3 THEN N3$=N$
834 IF Q=4 THEN N4$=N$
835 IF Q=5 THEN N5$=N$
836 IF Q=6 THEN N6$=N$

```

```

837 IF 0=7 THEN N7$=N$
838 IF Q=8 THEN NB$=N$
839 IF Q=9 THEN N9$=N$
840 IF Q=10 THEN N10$=N$
850 GOTO 810
852 IF R$="BIBLIOGRAPHY" THEN 856
854 PRINT :PRINT "PAGE NUMBER: ";:INPUT P
856 PRINT :PRINT "BIBLIOGRAPHIC #:";:INPUT B
860 PRINT CHR$(125)
870 POSITION 7,4:PRINT "PREPARE YOUR EPSON PRINTER"
880 POSITION 13,6:PRINT "FOR PRINTING"
885 PRINT :PRINT "    PRESS RETURN TO START PRINTING";:INPUT Z$
890 LPRINT CHR$(14);"    ";R$:LPRINT
903 IF T$="C" THEN LPRINT CHR$(15)
930 LPRINT N1$
935 LPRINT N2$
940 LPRINT N3$
945 LPRINT N4$
950 LPRINT N5$
955 LPRINT N6$
960 LPRINT N7$
965 LPRINT NB$
970 LPRINT N9$
975 LPRINT N10$
976 IF R$="BIBLIOGRAPHY" THEN LPRINT CHR$(14);"    RESOURCE #";B
977 IF R$="BIBLIOGRAPHY" THEN GOTO 980
978 LPRINT "    PAGE ";P;"    RESOURCE #";B
980 PRINT :PRINT "DO YOU WANT TO PRINT THIS AGAIN (Y/N)";:INPUT Z$
985 IF Z$="Y" THEN 860
990 PRINT :PRINT "WANT TO PRINT ANOTHER CARD (Y/N)";:INPUT Z$
995 IF Z$="Y" THEN PRINT CHR$(125):GOTO 200
998 PRINT :PRINT :PRINT "    H A P P Y    H U N T I N G ! ! !"
999 END
1000 POSITION B,21:PRINT "PRESS RETURN TO CONTINUE";
1010 INPUT Z$
1020 PRINT CHR$(125)
1030 RETURN
1200 PRINT :PRINT "    TOO LONG. ";TL;:PRINT "    CHARACTERS MAXIMUM."
1210 RETURN

```

**Figure 8.5 Listing for NOTECARD PRINTER**

## TRACKING RESEARCH WITH A WORD PROCESSOR

Another method which I've used quite successfully for managing research information is with a word processor. Its procedure may be analogous to writing the facts on sheets of paper titled with the corresponding subheading. A significant difference between the two media is that using a word processor allows one to rearrange ideas through block moves but the only way to rearrange ideas on paper is to erase, crossout, or cut up.

I first discovered this method in the pages of PC Magazine (February 19, 1985) in an article by Dara Pearlman. She explained how she had used a word processor to manage research information. Since then, I have used it quite successfully for various research projects.

Begin by making a list of your possible subheadings. Begin with BIBLIOGRAPHY and then type the rest in alphabetical order. Type these in capital letters. This will differentiate them from similar words in the text. When you have done this, make another copy of this list using the text copy feature in your word processor.

---

```

BIBLIOGRAPHY
AGRICULTURE
CLIMATE
GEOGRAPHY

```

GOVERNMENT

HISTORY

NATURAL RESOURCES

BIBLIOGRAPHY

1) ABBOTT, CARL. Colorado= A History of the Centennial State. Colorado Associated University Press, 1976.

2) "Colorado", World Book Encyclopedia, 1976 ed., Ci-Ca, PP 668-682.

AGRICULTURE

Colorado's chief products are beef cattle, corn, milk, sheep, sugar beets, and Wheat. (680c,2)

Farm products earn about \$2 1/4 billion a year. (680c,2)

CLIMATE

GEOGRAPHY

The Continental Divide runs through the Colorado Rockies. (199,1)

GOVERNMENT

HISTORY

NATURAL RESOURCES

## Figure 8.6 Taking Notes on a Word Processor

---

The first list of subheadings works as an index. This provides an easy reference of the available categories. The second list is used as the actual subheadings. Facts are entered under the related subheadings in the second list.

The reason for the heading index may not be apparent from this short example. As the list of facts grows, however, it's easy to forget the headings available. The index provides a quick reference instead of searching through the length of the document for a heading. If you need to include a fact at the end of the list, it is possible to start a search for that heading instead of scrolling down to that page. This will jump the screen directly to the desired position so that the information may be input.

Notice that each of the entries is followed by two numbers in parentheses. The first number indicates the page number where this fact was found. The second number refers to the bibliographic listing under the BIBLIOGRAPHY section.

Once the research is complete and all of the facts are input into the word processing file, half of the report is already written. An outline can be formed by moving the facts into a logical order. Then it's just a matter of turning your outline into paragraphs.

## Putting Pizzazz in Your Presentations

Now that you have researched your facts, it's time to put them to press. You must take your collection of information and transform it into a report that will both impress and educate the reader. Some authors feel the text will carry its own, but the truth is that it's the icing on the cake that gives it that air of authority.

A great salesman once stated that the key to success in selling is to "Sell the sizzle, not the steak." In either the academic or business world, success in report writing lies in selling the believability of the information. When a teacher grades a report, she evaluates the presentation as well as the content. She is interested in:

- 1) Factually correct and complete content
- 2) Well-developed line of thought
- 3) Good organization
- 4) Correct spelling
- 5) Proper grammar
- 6) Proper format
- 7) Neatness
- 8) Auxillary materials to further explain information

Using your Atari computer and Epson printer can help you either directly or indirectly in all of these areas.

The notecard method just explained can help in your management of factual information. It isn't a guarantee that you'll produce a good paper. Actually putting your research into sentence form is up to you as a writer, but it can help you organize your facts.

Using the cards in the manner explained will make it easier to organize your thoughts. Once you have them in a logical order, begin creating your paper on your word processor by connecting them together in sentences. There is no rough draft that needs to be restructured and recopied. If your thoughts on paper don't seem to be flowing-add, delete or rearrange the sentences so they do.

## CHECKING YOUR SPELLING

Spelling is a problem for many people. It's not that they're dumb or poorly educated. Most people are too busy with ideas to be hampered with the details of spelling. Rereading a manuscript doesn't always catch the errors either. The reading eye scans the paper in leaps and bounds. This causes it to sometimes skip errors again and again.

Once you have completed your work, your computer system can give you an advantage over others who are still using the antiquated typewriter method. Since your text is actually in the memory of your Atari computer, you can use a program to check your spelling. These types of programs are aptly named "Spelling Checkers." Spell Magic by Blue Collar Software is just one of the spelling checkers available for your Atari computer.

A spelling checker actually compares every word in your document with a dictionary of words that are included on the spelling checker disk. Whenever it finds a word that doesn't match any of the words in its dictionary, it assumes that it to be a misspelled word.

Many times the word isn't actually misspelled. It just isn't in the dictionary. It may be a proper noun or a specialized word. This word may be entered into the dictionary to prevent this name or word from being identified everytime the spelling checker is run.

A word of warning needs to be said here, however. A spelling checker is NOT going to correct all of your mistakes. It will find many typographical errors, i.e., typing "mayn" for "many". It may pickup many words that are plainly misspelled. But it does not have the capability of identifying improper usage of a word, i.e., "Their is a tree in there driveway." Both forms of "there" are spelled correctly so the spelling checker will be satisfied.

There are some grammar checkers on the market but, due to the complexity of the English language, they never seem to be as effective as a teacher's red pen. Use your spelling checker along with a keen eye for grammar and your reports should turn out almost letter-perfect.

## TITLE PAGES

It's been said that first impressions are lasting impressions. This is true in report writing as well. A creative cover page, a well-typed report and interesting accompanying materials are the keys to making a good presentation-GREAT!

Every report must have a title page. This is the first impression that introduces the reader to your work. Here you begin telling the reader whether the contents of this report should be dressed in a blue serge suit or denim coveralls. Impressing your reader on this page can even makeup for a less than perfect report.

Title pages follow a strict format in content. They include the title, author, instructor, class, and date. This information is typically typewritten. This style looks professional, but your Epson printer can do better. Use some expanded, reverse, and Near-Letter Quality print to give it a showier appearance (Figure 8.7).

---

**The Role of Play Behavior  
in the  
Baboon Society**

**by**

**Babs Boone**

**Dr. Gibbons  
Anthropology 101  
O Rang University  
November 20, 1985**

**Figure 8.7 Title Page Enhanced by Your Epson Printer**

---

These title pages are nice, but there are graphics packages for your Atari computer that will enable your Epson printer to produce outstanding covers. Print Shop by Broderbund Software is one of these packages. It is a graphics program that allows you to mix pictures with various type fonts to produce banners, signs, letterhead and even greeting cards.

Here is an example of what you can do with your Epson printer, Atari computer and Print Shop:

# THE ROLE OF PLAY BEHAVIOR IN THE BABOON SOCIETY

NOTE: Print Shop will not operate completely with the LX90 or HomeWriter-10 using the Atari PIC. Here are a few hints when it comes time to print your report:

1. Print using the Near-Letter Quality or emphasized mode.
2. Use a dark ribbon. If your ribbon is getting a bit light, print in the NLQ-Emphasized or emphasized-doublestrike mode.
3. Use a line length of 60 spaces. This means an inch and a half for the left margin and an inch for the right. Narrower line widths improve the readability (and make the report appear longer).
4. Number the pages using the "Page 1" format.
5. Instruct the word processor to type the title of the report as a heading at the top of every page. For example, to print the heading "Fish Species of the Caribbean" three lines above the first line of text and aligned with the left margin,

Atariwriter uses the command:

CTRL H Fish Species of the Caribbean,,

Paper Clip uses a similar command:

CTRL Z Fish Species of the Caribbean,,

For a longer paper, the current subheading is more appropriate than the title.

6. Include a bibliography to indicate further references and to emphasize the extensive amount of research you did for the report. If you used your word processor for collecting notes as discussed earlier, your bibliography is already done.

## **AUXILIARY MATERIALS**

These are the charts, graphs, pictures, and drawings that emphasize your points in the report. They are important because they break up pages full of words and give another dimension through which the reader may learn your information. This is what makes a GREAT paper a \* \* SUPERIOR \* \* paper.

While illustrative materials can make the report exciting, they can also destroy the impact if done poorly. Using your Atari computer and Epson printer in creating these materials can, in many cases, produce higher quality work with less effort than doing them by hand.

Charts are simple with a word processor. Instead of drawing boxes and then trying to fit your text inside, you can mold your text first and then make the boxes. When modifications are necessary, just make the changes and reprint. No need to redo the whole chart.

Since your Epson printer is a dot-matrix printer, it is capable of printing refined graphics. It can print point, line, and bar graphs equally well. These are most effective when comparing quantities or statistics. Chapter 12 includes a program for creating bar graphs.

Your Epson printer is also quite an artist. It can produce graphic illustrations in much the same way as a newspaper makes pictures with tiny dots.

More of the graphics capabilities of your Epson printer will be discussed in Chapter 10.

Combining all of these special elements of a superior report will certainly improve the grades you receive on your efforts. The next chapter discusses ways in which your computer system can help you in mastering subject material. It will cover study habits and ways your Epson printer can help make you a better test-taker.

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)

---

## Chapter 9

---

# Improving Test Scores with the Computer

One of the burdens of attending (and teaching) school is testing. The testing situation is one that evokes anxiety, loss of memory, sweaty palms, and many things that education isn't meant to be. In truth, a written test actually tests how well a student can take a written test as much as it tests his mastery of the facts. Few teachers will tell you that written tests are the best way to evaluate a student's knowledge, but many will admit that it is the only way available in most situations.

Succeeding on tests is usually the result of knowing what to study, how to study it, remembering it when it's asked on the test, and then conveying it in a manner that is understandable and acceptable to the teacher. There is a method in preparing for this. It is by no means a short-cut method, but it can make your hours of studying more productive. The method described here will be directed towards the high school and college student, but the same general method can be used in studying for a test in sixth grade as when studying for a college exam in freshman biology.

Included in this chapter is a program listing for the QUIZ MAKER. This program is designed for making practice quizzes using your Commodore 64 and Epson printer.

### LEARNING A SUBJECT

The key to success in test taking is in the preparation. Some people call test preparation "studying" while others call it "cramming." Whatever it's called, there are ways that are more beneficial than others. The key to success is to find those ways and apply them to your own studying skills.

1) **Understand How You Learn**-People learn in different manners. Some learn best when they are told information. Some find that the information has more of an impact if they read it. Many learn facts better if they write them out. Most people learn information better if they can apply it in an actual application.

If you aren't quite sure of your best style for learning, try answering this question: When someone is giving you directions for going to the shoe store, would you rather they tell you how to get there or draw a map? If you'd rather be told, then you are an auditory learner and learn best from listening. If you like to see a map when their explaining, then you are a visual learner and learn best when you read and see things.

Once you realize how you best learn, you can then spend more productive time concentrating on that mode of learning. Don't think that you must limit yourself to that style of learning. Use every mode of input you can. The best way to learn is through multiple forms of input.

2) **Attend the Classes**-This may seem like a basic assumption, but you'd be surprised at the number of students who "hangout" at the beach instead of attending class and then stay awake all night the night before a test trying to learn the information from a book.

Going to class is important for many reasons. As has already been discussed, some people learn best when they are told information. Many times the material covered in class will not be covered in the text. This means that missing class is a loss that can never be made up. This is also a chance to learn about the personality of your

teacher and what he thinks is important. Knowing where your teacher places his priorities is helpful in anticipating what will be on the test.

Attending is not enough. Take notes on the lecture and participate in the discussions. Learning is an active process and means more when you listen, mentally process the information, and then immediately apply it through discussion or activity. This chance for application allows you to try out the ideas you just learned and to find where you might have misconceptions.

3) **Read the Text**-Another seemingly obvious point, but not one that is always followed. Many students don't read the text until the week before the test. This creates a great amount of pressure on the student to absorb all of the information and limits the value of using the text as a learning tool. The best approach is to read chapters in the text before they are discussed in class. When you read a chapter, you form your own impressions of it. When it is discussed in class, you have some frame of reference to use when comparing the presented information with what you read. This style of studying requires a bit more planning but it makes learning the material MUCH easier in the long run. Try to do additional reading if possible.

4) **Retype Your Notes**-Notes are usually taken at break-neck speeds and resemble chicken scratchings more than the English language. They may be somewhat legible, but they don't have the readability or organization necessary for effective studying. Retyping them requires you to review, rethink, and reorganize the information into a format that's easy for you to understand and study. This was something I always thought to be extra work until I tried it. Even if you're not much of a typist, using a word processor makes this a fairly easy task that can increase the effectiveness of your studying time by 80%.

5) **Discuss the Subject with Others**-Applying the information is the best way to ensure learning it. Some subjects, like computer programming, are fairly easy to apply, but other areas, like sociology, need to be discussed with others. This provides an arena where you can test your ideas and learn from others.

6) **Discuss the Subject with Your Teacher**-Most students don't meet with the teacher outside of the classroom. This is a terrible waste because a teacher knows much more about the subject than he is able to cover in the limited amount of class time that is afforded to him. Taking time to meet with your teacher will provide a chance to learn more about the subject and learn more about your teacher. This may not seem important to you, but it will when it comes time for you to prepare for a test. If you know your teacher, you will have a better chance of knowing what sort of questions he might ask and what areas he might emphasize.

## PREPARING FOR A TEST

You can only do well on a test if you can answer the questions that are asked on that test. It sounds naively simple, but consider what you just read. A test is made up of a finite set of questions and knowing the answers to questions that aren't on the test won't help you pass. You may thoroughly understand the symbolism in *Romeo and Juliet* but it will do you no good if you're asked about *Othello* on an English literature exam.

The key to passing tests is being able to anticipate test questions, studying for them, and then answering them correctly on the test. It's as simple as that.

Over the last couple of pages I have stressed the importance of understanding the subject and your teacher. The primary reason for this is to aid you in learning the information so that you may apply it in the real world. The secondary reason is to aid you in anticipating test questions by knowing what information is important and what's interesting filler.

There are two ways to anticipate test questions. The first way is the most direct. Ask the teacher. Many teachers are willing to share with you the areas they consider important. They may even provide you with study sheets. If your teacher isn't so accommodating, check your library. Many times teachers will place past tests on file so that interested students might preview the types of tests he gives. This is not cheating. It is preparing oneself for the test.

The second way is a bit less certain. Some teachers won't spend time giving "hints" about their tests. They feel that you should know everything about everything. This being the case, it's up to you to try to anticipate the contents of the test.

Consider how your teacher is going to create the test. He will set down the material covered in class or in the text and then decide what is important enough to hold you responsible for knowing. You can try to anticipate his questions by going through the same process.

Begin by reviewing your notes. Look for facts that lend themselves to test questions. Reasons for things happening like "Explain the forces that led to the start of World War I" make good questions. Lists make ideal questions because they are either right or wrong; "List the bones in the arm" or interpretations of specific incidents, "What did Patrick Henry mean when he said, "Taxation without Representation is tyranny?"

As you discover each of these delicious possibilities, make up a question that will use this information for its

answer and type them both into your word processor. As you type these in, you're doing two things: 1) you're creating your own test-complete with answer sheet, and 2) you're reviewing the information again by reading it, thinking about it, and then writing it.

After you've created your "practice test," print it out on your Epson printer. This will give you a study sheet. Use this sheet to ask yourself questions and then check your answers for correctness.

Full-sized sheets of paper can be bulky if you're busy and want to study on the run. Try creating "flash cards" using 3 x 5-inch index cards. Write the question on one side and the answer on the other. This is exceptionally good for learning recall facts like capitals of states and authors of books.

You can print them on your printer by narrowing the margins to 40 spaces and the page length to 15 lines. Since you will have to reposition the card at the end of each "page," set the word processor for separate sheet printing instead of continuous paper. If you haven't already, you will also need to turn off the PAPER OUT sensor using the DIP switches in your Epson printer.

If you're using Atariwriter, use these commands to set your word processor for printing on 3 x 5" cards:

(B12) L15 R55 S2 T12 Y36

If you're using PaperClip, these commands will do the trick:

**CTRL M T2**  
**CTRL M B15**  
**CTRL M L15**  
**CTRL M R55**  
**CTRL Z L18**

Insert enough blank vertical lines between the questions and answers in your word processor so that the questions and answers are on different "pages." This way the word processor will print out the question on one side of the card and then wait for you to turn it over before printing the answer.

Here are some hints on studying:

- 1) Don't involve a family member in your studying unless it's to explain something they understand. Asking someone else to give you a test is, many times, a way for your subconscious to ward off studying. You're shifting the success of your studying onto their shoulders. The responsibility for studying lies with you and you alone.
- 2) Review your study sheets immediately before going to bed. This freshens the facts in your mind and your subconscious will mull over them while you are asleep.
- 3) Study whenever possible. You don't just have to do it when you're sitting at your desk. Carry your pack of study cards with you so that you may review them anywhere.
- 4) Don't try cramming just before the test. Enter the testing room with two sharpened pencils, paper (if necessary) and the attitude of "If I don't know it now then I'll never know it."
- 5) When you're studying, try to relate some facts to your own experiences. When you study the American Revolution try relating it to your trip three years ago to Virginia.
- 6) When you're studying lists, try to devise some memory trick that will help you remember everything in the list, i.e., the notes on the staff lines in sheet music can be remembered with the sentence, Every Good Boy Does Fine. These notes are E, G, B, D, and F

## PRACTICE TESTS

Reviewing the answers to questions in your mind is an effective way of studying, but your preparation for the test will not be complete until you have actually written the answers on paper. The mind has a unique way of filling in blanks with "you know..." and "and so forths. . ." where you don't know the answers. This becomes a problem when you sit down to the test and you're forced to fill in those blanks with actual words.

I have included a program called "Quiz Maker" here which will produce practice tests for you to use. You begin by typing in the questions. These questions are then saved in a file for later use. When you want a practice test, you merely enter the number of questions you want to use for the test and it will select the questions at random and print them out.

```

20 REM * * PRINTS PRACTICE QUIZZES * *
30 DIM A$(1),B$(80),C$(15),NME$(12),Q$(80),QT$(2000),R$(1),TTLE$(40),Z$(40)
40 DIM BL$(1),Z(25)
100 PRINT CHR$(125)
110 Z$="QUIZ MAKER":GOSUB 1110
120 POSITION 5,4:PRINT "DO YOU WISH TO:"
130 POSITION 10,6:PRINT "C) CREATE A QUIZ"
140 POSITION 10,8:PRINT "P) PRINT A QUIZ"
150 POSITION 10,10:PRINT "Q) QUIT"
160 POSITION 19,12:INPUT A$
170 IF A$="C " THEN GOSUB 210
180 IF A$="P" THEN GOSUB 760
190 IF A$="Q" THEN PRINT :PRINT "    B E S T    O F    L U C K ! ! !":END
200 GOTO 100
210 REM * * CREATE A QUIZ * *
220 PRINT CHR$(125)
230 Z$="CREATE A QUIZ":GOSUB 1120
240 PRINT :PRINT " THIS PROGRAM ENABLES YOU TO WRITE A"
250 PRINT "SET OF QUESTIONS FOR PRACTICE QUIZZES"
260 PRINT :PRINT " ANOTHER PART OF THIS PROGRAM ALLOWS"
270 PRINT "YOU TO PRINT QUIZZES WHICH CONTAIN A"
280 PRINT "RANDOM SELECTION OF THESE QUESTIONS."
290 PRINT :PRINT " BEFORE YOU BEGIN, YOU WILL BE ASKED"
300 PRINT "TO INPUT A SUBJECT TITLE, THE NUMBER"
310 PRINT "OF QUESTIONS, AND A TITLE FOR THE "
315 PRINT "FILE FOR STORING YOUR QUESTIONS."
320 PRINT :PRINT " INPUT EACH QUESTION ONE AT A TIME."
330 PRINT "WHEN ALL OF THE QUESTIONS HAVE BEEN"
340 PRINT "INPUT, YOU WILL BE ABLE TO PRINT"
350 PRINT "YOUR QUIZ. "
370 GOSUB 1070
380 REM * * INPUT QUIZ INFORMATION * *
390 PRINT CHR$(125)
400 Z$="QUIZ INFORMATION":PRINT :GOSUB 1120
410 PRINT :PRINT :PRINT "WHAT IS THE TOPIC OF YOUR QUIZ ";:INPUT TTLES
420 PRINT :PRINT "HOW MANY QUESTIONS WILL YOU USE?"
430 PRINT "(25 QUESTIONS MAX) ";:INPUT N
440 PRINT :PRINT "WHAT FILE NAME DO YOU WISH TO USE? "
450 POSITION 5,12:INPUT NME$
460 GOSUB 1260
470 IF A=2 THEN 390
480 GOSUB 1300
490 OPEN #2,8,0,NME$
500 PRINT #2;TTLE$
510 PRINT #2,N
520 CLOSE #2
530 REM * * INPUT QUESTIONS * *
535 OPEN #2,9,0,NME$
540 FOR P=1 TO N
550 PRINT CHR$(125)
560 Z$=TTLE$:GOSUB 1120
570 PRINT :PRINT "QUESTION #";P;" OF ";N
580 PRINT :PRINT "QUESTION: ";
590 INPUT Q$
600 IF LEN(Q$)>80 THEN PRINT :PRINT "    TOO LONG - 80-CHARACTERS MAX:":GOSUB 1070
610 IF LEN(Q$)>80 THEN GOTO 470
620 GOSUB 1260
630 IF A=2 THEN 470
650 PRINT #2;Q$
660 NEXT P
670 CLOSE #2
740 RETURN
750 REM * * PRINT QUIZ * *
760 PRINT CHR$(125)
770 Z$="PRINT A QUIZ":GOSUB 1110
780 PRINT :PRINT :PRINT " THIS PROGRAM WILL PRINT A RANDOM"
790 PRINT "SELECTION QUESTIONS FROM A PREVIOUSLY"
800 PRINT "CREATED QUIZ FILE."
810 PRINT :PRINT "WHICH FILE DO YOU WISH ",
820 INPUT NME$
830 GOSUB 1300

```

```

840 OPEN #3,4,0,NME$
850 INPUT #3;TTLE$
855 INPUT #3;N
856 CLOSE #3
870 PRINT :PRINT " HOW MANY QUESTIONS DO YOUR WANT?"
880 PRINT " ";N;"= MAX # OF QUESTIONS. ";:INPUT T
890 IF T>N THEN 870
900 PRINT :Z$="PREPARE YOUR PRINTER":GOSUB 1120:GOSUB 1070
910 OPEN #1,8,0,"P:"
920 PRINT #1;:PRINT #I;CHR$(14);"PRACTICE QUIZ ON ";CHR$(20);TTLES
925 PRINT #1;:PRINT #1;:PRINT #1
928 REM * * RANDOMIZER * *
930 FOR R=1 TO T
940 Z(R)=INT(RND(0)*T)+1
943 IF R=1 THEN 950
945 FOR S=1 TO R-1
947 IF Z(R)=Z(S) THEN 940
948 NEXT S
950 OPEN #3,4,0,NME$
951 INPUT #3:TTLE$
952 INPUT #3;N
955 FOR P=1 TO Z(R)
960 INPUT #3;Q$
965 NEXT P
970 PRINT #1;Q$
975 FOR V=1 TO 6:LPRINT :NEXT V
980 CLOSE #3
985 NEXT R
998 RETURN
999 REM * * GET AN ANSWER * *
1000 PRINT " (Y/N)";
1010 INPUT A$
1020 IF A$="Y" THEN A=1:GOTO 1050
1030 IF A$="N" THEN A=2:GOTO 1050
1040 GOTO 1010
1050 RETURN
1060 REM * * CONTINUE PROMPT * *
1070 PRINT :PRINT " PRESS RETURN TO CONTINUE";
1080 INPUT A$
1090 RETURN
1110 REM * * CENTER A STRING * *
1120 FOR V=1 TO ((39-LEN(Z$))/2):PRINT " ";.NEXT V:PRINT Z$
1130 RETURN
1250 REM * * CORRECT QUESTION * *
1260 PRINT :PRINT :PRINT " IS EVERYTHING CORRECT";:GOSUB 1000
1270 RETURN
1299 REM * * CONCATENATE D1: & NME$
1300 C$="D1:"
1310 C$(4)=NME$
1320 NME$=C$
1330 RETURN

```

**Figure 9.1 Program Listing for the Quiz Maker**

---

## TAKING THE TEST

Now that you've prepared, it's time to take your test. You've done everything you could to anticipate the questions, studied the necessary information ... and now it's time to see if it will pay off.

Interestingly enough, taking a test can be almost anticlimatic. You've spent days-even weeks-studying ... memorizing ... learning everything possible about the subject. Now, within the next ninety minutes it will all come to an end.

Look into the eyes of many test takers and you'll see outright fear. This is the sign of poor preparation and potential failure. The only winning attitude for this sort of situation is confident resignation. Confident resignation is the feeling you have when you realize you've done everything possible to master the material and there is nothing more to do except answer the questions.

The tests are passed out. You receive yours and begin looking it over. The first couple of questions aren't too difficult. There's one that's questionable. "Didn't think that next one would be on the test. What the heck does he mean in question five?"

Feel your blood pressure beginning to rise?

Stop! These first few minutes are where many tests are won or lost. Calm down and review the complete test. Whenever you're certain of a quick answer, write it down. When you come to ones that will take a little more time, quickly write down all of the pertinent points that come to mind. If you discover one that is way out of the ballpark, ignore it for now or write down a couple of thoughts that might be helpful later on.

When you've reviewed the test once, look at the allotted time limit and mentally decide on a schedule for answering the questions. Start with the easy ones. Answer them quickly and get them out of the way. These are where you accumulate your easy points.

Now go back to those longer answers that you knew but realized would take some thinking. Read the question again and then write down as many relevant facts as you can. Don't worry about the order, just use free association.

When you have completed writing down your thoughts, stop for a moment and reread the question. It's easy to go off on a tangent that is totally unrelated to the question. You must re-orient yourself to ensure that you will really answer the question that is being asked.

With the question in mind, begin organizing your ideas into groups. Then arrange these groups into logical order. You don't have to use all of the ideas or all of the groups. Throw them out if they don't fit. The most important about writing this answer is to answer the question in an understandable, logical sequence. Rambling answers appear as if the writer doesn't know what he's talking about. Even if you don't know what you're talking about, don't ramble.

Now it's time to tackle those questions you're not too sure about. Surprisingly, the work you've just done with those other questions may have sparked some ideas. If the questions are multiple choice or short answers, make some educated guesses. Use the process of elimination to answer the multiple choices and use some imagination to answer the others.

When trying to answer an essay question for which you really don't have an answer, use the same process of free association and organization to construct an answer. Maybe your answer will be totally fabricated, but what do you have to lose? If you left it blank you wouldn't get any points anyway. If you try to answer the question you might receive a couple of points for being creative.

It's important to leave enough time at the end of the session for reviewing your answers. Read your answers for spelling, grammar and logic. When you reread your answer you may find that you didn't actually say what you thought you did.

Give your teacher a big smile when you turn in your test and then forget about it. It's over. Worrying and fretting won't change the terrific effort you just expended. Consider it a job well done and move onto the next challenge.

You've worked hard and studied well. Now it's time to let some of your creative juices flow. The next chapter teaches you how to make your Epson into an electronic easel for your creations. Your printer provides many graphic possibilities that are both fun and challenging.

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)

---

## Chapter 10

---

# Programming Applications for Your Epson Printer

You may not be the type of person who enjoys having others do your work for you. Or maybe you feel constrained by the limits an application program like a word processor instills when you feel like communicating with your printer. Or maybe you're just plain creative and want to use your printer as a pallet for expressing yourself. Whatever your motivation, this chapter will explore the ways in which you can use your Atari computer and Epson printer to do more than print letters.

### COMMUNICATING WITH YOUR EPSON PRINTER THROUGH BASIC

Your Atari computer can communicate with your Epson printer in two different ways. The easiest is through a modification of your old friend the PRINT statement, LPRINT. LPRINT means Line PRINT and it tells your computer to send a string of characters to your printer. Make sure your printer is on and try typing this BASIC program line:

```
LPRINT; "I'm your Epson printer. How are you?"
```

Your printer should come to life and begin asking about your health. If it doesn't, make sure it's on and check the connections between it and your Atari computer.

Another way to send text to your printer is by opening it like a file and then printing information to it as you would to a data file. Begin by catching its attention with this line:

```
OPEN #1,8,0,"P:"
```

This line states that you are opening a file and naming it #1. The 8 indicates that you'll be outputting to that file. The 0 position will be ignored in this case, so it is working as a place-holder. The "P:" at the end of the line signifies that the information will be sent to the printer.

Once you have OPENed the file with the previous line, you can send information to your Epson printer to be printed by using a PRINT#1 command. This is similar to the LPRINT statement in this function, but the same PRINT#1 command can be used to send information to a disk drive, monitor, or modem, depending upon how you define the output port in the OPEN statement.

When you have completed your printing, close the file with a CLOSE #1 command at the end of the program. Here's a program to try:

```
10 OPEN #1,8,0,"P:"  
20 PRINT #1; "I'm your Epson printer. How are you?"  
30 CLOSE #1
```

Run this program and see if it works. If it doesn't, check that you've copied the program exactly. If you want to see your program again, type LIST. This will cause a listing of your program to scroll up your screen.

You can also print a listing of your whole program on your printer. Type LIST "P:". This is particularly handy when you're writing programs. It's much easier to find mistakes in long programs when you can leaf through pages of printed listings than trying to pick out the problems as they scroll up the computer screen.

If your Epson printer has the SelecType feature, you can use some of its type styles to make your listings more readable. Use the Double-Strike mode if your printer ribbon is getting a bit light. Compressed mode can improve the readability of your listings by fitting up to 132 characters on a line.

The Near-Letter Quality style improves readability in a couple of ways. First, the finely formed letters are more distinct and easier to read. Second, all of these letters will print in lower-case. This is because NLQ prints in the Upper/Lower-case mode which will be explained later. It looks a little strange to a seasoned programmer, but it is definitely easier to read.

## USING CONTROL CHARACTERS

Your Atari communicates with your Epson printer through the use of numbers. As words have specific meaning to us, various numbers have specific meanings to our computers. The language they speak is ASCII (American Standard Code for Information Interchange).

There is an ASCII chart in the Appendix of this book. This chart translates the decimal codes from zero through 255 into their printed character representation. Some of the codes have no printed representation. They may be used to send messages to the printer or they may have no meaning to the printer whatsoever.

You can use these ASCII codes to control your Epson printer into doing your bidding. These codes are sent to your printer through BASIC using the CHR\$ function. A typical statement would read:

```
PRINT#1; CHR$(76) or LPRINT, CHR$(76)
```

This statement tells your printer to print the letter L. Substituting the number 76 with 60 would print an < symbol. Either way, these numbers take the place of the actual symbol. It may seem strange to represent a letter with a number, but the printer knows exactly what is meant.

Messages are sent in the same manner. PRINT#1, CHR\$(10) tells the printer to advance down the page one line (LINE FEED). In Chapter 4, you used the value of 14 to set the printer into the expanded print mode. There is a whole selection of printer control codes that can be sent in this manner.

Here's a list of the non-printing messages the Atari computer can send to the Epson printer.

---

| CHR\$ | Function                                    |
|-------|---------------------------------------------|
| 8     | Backspace                                   |
| 9     | Horizontal tab move                         |
| 10    | Line feed                                   |
| 11    | Vertical tab                                |
| 12    | Form feed                                   |
| 13    | Carriage return                             |
| 14    | Turn on expanded character pitch            |
| 15    | Turn on compressed character pitch          |
| 16    | Tab setting                                 |
| 17    | Turn on upper/lower case (cursor down) mode |
| 18    | Turn off compressed character pitch         |
| 20    | Turn off expanded character pitch           |
| 26    | Repeat graphics data                        |
| 27    | Escape                                      |

---

**Figure 10.1 Print Control Characters**

---

## SPACING ON THE HORIZONTAL PLANE

There are a number of ways to position printing horizontally. Some of these may already be familiar to you as commands for formatting text on the screen. Don't be fooled into thinking that these commands will act the same

on your printer because in some cases they won't.

There are two punctuation marks used for formatting printed output; the comma and semicolon. On the screen, the comma causes output to be lined up in four columns. These columns are the beginning of print zones. Each print zone is ten spaces wide. They begin in columns 1, 11, 21, and 31. This program will demonstrate how the comma works in formatting screen output.

---

```
10 DATA A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P
20 FOR T = 1 TO 16
30 READ A$
40 PRINT A$,
50 NEXT T
60 PRINT "0123456789012345678901234567890123456789"
```

### Figure 10.2 Screen Formatting with Commas

---

This program shows how it will print numbers in columns:

---

```
10 FOR T = 1 TO 16
20 PRINT T,
30 Next T
40 Print "0123456789012345678901234567890123456789"
```

### Figure 10.3 Screen Formatting with Commas

---

Notice the numbers are lined up in columns 1, 11, 21, and 31. This is because every number is preceded by a space for a positive or negative sign. This space is blank in this case because it is positive.

Now let's try using the comma when printing to your Epson printer using the LPRINT statement:

---

```
5 DIM A$(1)
10 DATA A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P
20 FOR T=1 TO 16
30 READ A$
40 LPRINT ,A$,
50 NEXT T
55 LPRINT , " "
60 LPRINT , "0123456789012345678901234567890123456789012345678901234567890"
```

### Figure 10.4 Printer Formatting with Commas

---

Depending upon your style of Epson printer, your output may have printed in the intended horizontal manner or each of the letters may have been printed on its own separate line. If the latter is the case, it is due to an idiosyncrasy of the way your Atari computer sends information to the printer. To overcome this, use the PRINT#1: command instead of the LPRINT statement to send information to the printer. Your modified program might look like this:

---

```
5 DIM A$(1)
10 DATA A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P
15 OPEN #1,8,9,"P:"
```

```

20 FOR T=1 TO 16
30 READ A$
40 PRINT #1,A$
50 NEXT T
55 PRINT #1, "  "
60 PRINT #1,"0123456789012345678901234567890123456789012345678901234567890"
70 CLOSE #1

```

### Figure 10.5 Modified Formatting with Commas

---

Notice that the letters aren't lined up. Instead, they each have ten spaces between them. After the "H" in the first line, there were only two spaces so your printer used eight additional spaces on the next line and printed the "I" in column 9.

This type of formatting is not very useful for printing multiple lines, but it is quite handy for single lines of output.

Another form of punctuation used for formatting is the semicolon. This is used for printing letters, numbers or words immediately after one another. Try this program to see what I mean:

```

10 OPEN #1,8,0,"P:"
20 PRINT #1;"THIS ";
30 PRINT #1;"IS ";
40 PRINT #1;"ON ";
50 PRINT #1;"ONE ";
60 PRINT #1;"LINE "
70 CLOSE #1

```

### Figure 10.6 Printer Formatting with Semicolons

---

The Comma and Semicolon are helpful in formatting your printed material. There are times, however, when you want to be specific about exact location. TAB and SPC handle this quite nicely.

## GRAPHICS

Before any graphics can be printed on your Epson printer, it must be switched from the default text code to the graphics mode. This mode is used for printing patterns of dots which don't necessarily represent letters. These patterns can be used to create custom characters or combined to produce full-page illustrations.

As I explained previously in Chapter 1, The print head is comprised of a column of nine pins. In the graphic mode you are able to address only the top eight. Each of the pins has a number assigned to it. See the figure below.

Each of these pins may be individually controlled by sending its value to the printer. To signify the number 1 pin you send the value of 1 to your printer. Striking with the number 16 pin requires you to use the number 16. This process is rather straight forward.

It becomes a little trickier when you want to shoot forth more than one pin at a time. This configuration of eight pins will yield 256 combinations. Each of these combinations can be represented by adding together the value of the pins. That value is then sent to the printer to tell it to fire the pins totaling the selected value. The combination of the top and bottom pins would be represented by the value of 129 ((1 + 128) = 129).

Here are a few examples of calculating the print code for particular pin combinations:

With this computational concept in mind, it's time to begin taking control of your Epson printer and design your own graphic images.

## DESIGNING YOUR OWN GRAPHICS

Let's begin with something simple. Earlier you calculated 129 as the code for printing the number 1 and number 128 pins together. Let's use this code to print two parallel lines a hundred dots long.

```
10 OPEN #1,8,0,"P:"
20 PRINT #1;CHR$(27);"K";CHR$(101);CHR$(0);
30 FOR T=1 TO 100
40 PRINT #1,CHR$(128);
50 NEXT T
60 CLOSE #1
```

Figure 10.9 Two Parallel Lines

Run this program and you will be the proud owner of two parallel lines, each a hundred dots long. Before your printer could separately address those pins, you had to switch it from the default text mode to a Graphics Mode. The CHR\$(27);"K" in line 20 selects the Single-Density Graphics Mode (60 dots per horizontal inch). This is only one of four graphics density modes available for use with your Atari computer.

| MODE | Density             | Code          | Description                       | Speed |
|------|---------------------|---------------|-----------------------------------|-------|
| 0    | Single              | CHR\$(27):"K" | 60 dots/inch<br>480 dots/8" line  | 16    |
| 1    | Low-Speed<br>Double | CHR\$(27):"L" | 120 dots/inch<br>960 dots/8" line | 8     |

|   |                      |               |                                    |    |
|---|----------------------|---------------|------------------------------------|----|
| 2 | High-Speed<br>Double | CHR\$(27):"Y" | 120 dots/inch<br>960 dots/8" line  | 16 |
| 3 | Quadruple            | chr\$(27):"Z" | 240 dots/inch<br>1920 dots/8" line | 8  |

**Figure 10.10 Graphic Modes**

The two numbers following the "K," CHR\$(101); CHR\$(0), determine the number of columns reserved for graphics. In this case, 101 columns are reserved. The first number can be anything up to and including 255. Numbers greater than 255 can be depicted by including the multiple of 256 in the second number spot and then use the first number spot to display the balance. If you wanted to reserve a full line (480 columns) in Single Density, it would look like this:

```
PRINT#1; CHR$(27); "K"; CHR$(224); CHR$(1);
```

Lines 30 through 50 make up a print loop in which the top and bottom pins are fired simultaneously 100 times. The semicolon after CHR\$(129) serves to turn the print loop into one continuous string and to perpetuate the effects of the graphics mode command from line 20.

Line 60 empties the printer buffer and closes the printer as a file.

## PRINTING AS A PICTURE

Designing your own graphic character is a matter of planning, plotting and programming. At first it may sound a bit complicated but take heart. After you've completed a couple of pictures, the whole process will seem amazingly simple.

Begin by selecting the figure you wish to design. I suggest for your first few that you use curveless figures composed mainly of vertical and horizontal lines. These shapes are easier to create in the grid-bound world of your Epson printer than circles and curves.

For demonstration reasons, I have chosen to create a picture of a floppy disk. I begin by plotting the picture on pieces of graph paper or the grid shown in Figure 10.9. The dimensions of your grid are virtually limitless, but since this is the first picture, I have limited my floppy diskette to a 7 x 7 square.

Once you have plotted your picture, it's time to pull out your calculator to turn these dots into numbers so that you may feed them to the Epson printer. Notice the numbers running down the side of the graph. They correspond to the values of the seven pins on the print head. Since you want the pins to strike everywhere you have drawn a dot, you must add the values of the pins in each of those columns.

Now take these values and plug them into a program that is similar to the one used to print the double lines using pins 1 and 64. This program uses a READ-DATA statement to input the values into the PRINT#1, command in line 20. This method is quite handy in programs like these where great amounts of data have to be input.

---

```
2 REM FLOPPYDISK
5 REM SAVE "D1:FLOPPYDISK"
10 OPEN #1,8,0,"P:"
20 PRINT #1;CHR$(27);"K";CHR$(8);CHR$(0);
30 READ A
35 IF A=0 THEN 60
40 PRINT #1;CHR$(A);
50 GOTO 30
60 PRINT #1;
70 CLOSE #1:END
80 DATA 254,130,146,174,146,162,254,0
```

### Figure 10.13 Listing of Floppy Disk

---

Notice the DATA line ends with a 0 (zero). This indicates the end of the data. Without it, you will receive an "OUT OF DATA" error message. Also notice the semicolons at the ends of lines 20 and 50. These are easy to forget but necessary to the program.

## MAKING IT BIGGER

Don't be dismayed by the small size of your floppy disk. Remember that you're only creating figures the size of a letter on the typewritten page. It is possible to make your floppy disk larger, however, by drawing it to scale on a larger grid. Let's make it four times as large.

Figure 10.6 shows the floppy disk drawn in a 4:1 scale. This means that for every pin on the first drawing, you will use four pins on this drawing. It is twice as long and twice as tall. Because it's twice as tall, it will be printed on two horizontal lines. The sums of the pins must be calculated for the top half and then for the bottom half.

Take these values and insert them into the program used to create your first floppy disk picture. This program is similar to your original floppy disk program except it uses more data. The data in lines 80

and 90 print the top half of the floppy and lines 100 and 110 direct the printing of the bottom half.

---

```
2 REM BIGFLOPPY
5 REM SAVE "D1:BIGFLOPPY"
10 OPEN #1,8,0,"P:"
20 PRINT #1;CHR$(27);"K";CHR$(15);CHR$(0);
30 READ A
35 IF A=0 THEN 60
37 IF A=1 THEN PRINT #1,:GOTO 30
40 PRINT #1;CHR$(A);
50 GOTO 30
60 PRINT #1;
70 CLOSE #1:END
80 DATA 127,64,64,64,64,65,66
90 DATA 66,65,64,64,76,76,127,1
100 DATA 254,2,2,2,2,1.30,126
110 DATA 126,130,2,2,2,2,254,0
```

### Figure 10.17 Listing of BigFloppy

---

Notice the 1 at the end of the DATA line 90. This indicates the end of a line of printing. When line 37 recognizes the 1, it inserts a carriage return with a PRINT#1, statement. This advances the paper one line and positions the print head for printing the bottom half of the floppy. You may use this method to print graphics on multiple lines.

## Now Run the Program

Creating your own printed graphics can be quite rewarding. Your Epson printer makes it easy to advance beyond using a printer for merely letter writing. It allows you to use it as a pallet for your imagination.

You've seen how versatile your computer system has been around the house and in school. The next section will cover how it can help in running your business. It will discuss word processing around the office as well as around the world.

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)

---

## Chapter 11

---

# Business Writing with the Epson Printer

Communication is the name of the game in running any successful business. This communication must be fast, accurate, and effective. Your Atari computer and Epson printer can become integral parts in your business's communication system.

This chapter deals with ways to use your computer system in improving your written information exchange. Chapter 13 investigates how you might use telecomputing as another aspect of your business network.

### BOILERPLATING YOUR CORRESPONDENCE

Business often involves repetitious writing. Form letters are sent to clients. Business agreements contain standard phrases and paragraphs that must be typed over and over again. Listen to the secretaries in most any office and you will hear them muttering "There must be an easier way."

There is. It's called "boilerplate word processing." The repeated paragraph is entered only once through the keyboard and stored in a file of its own. Thereafter, when it is to be included in the text of a letter or agreement, it can be electronically loaded from the file into a working document where it can be hand edited to fit the text. This method can be used to create complete documents by loading multiple paragraphs, each from its own file.

Here is an example of a "Request for Bids" created using the boilerplate method. Due to the nature of the bidding process, every request requires varying parts to be included. This Request was constructed on the Atari computer by loading each of the paragraphs from its own file. It was then printed on an Epson printer using Near-Letter Quality print.

Notice the letterhead. It too was created using a word processor and then loaded into its own file. This is useful in writing letters. Begin by loading the letterhead file into your empty word processor and then start typing. When you have completed your letter, change the name of your destination file and save your letter on diskette.

## **BOILERPLATE LETTERS**

Another style of boilerplate word processing is an electronic version of the form letter. The form letter is a style of correspondence used for decades by business for mass mailings. The letter is usually written in a non-personal manner with space at the top where the recipient's name can be typed. Invariably, however, the type style of the name doesn't match that of the letter and the recipient recognizes the letter for exactly what it is, a form letter.

Word processing has provided a way to make the form letter a bit more personal. Figure 11.2 shows an example of a boilerplate letter. Each of the words preceded by an asterisk, i.e., \*APPLICANT, \*POSITION, is a variable to be substituted with specific information about the recipient. This method allows the sender to enter the pertinent information into the memory of the Atari computer and then print the letter as a whole. There is no filled-in appearance.

## MEMO MAILERS

Some business tasks can be accomplished by sending simple memos through the mail. You can buy continuous feed memo mailers (on NCR paper) which allow you to print the memo and mailing address on the same side of the paper. The duplicate sheets provide you with file copies and folding the sheet in half creates an addressed envelope waiting for a stamp.

Memo mailers make the task of sending non-payment reminders easy. This process can be made even easier by using a boilerplate form to print the reminders. Figure 11.3 shows a sample of such a boilerplate. The top half of the form is the memo and the bottom half is the actual address for mailing.

---

Dear \*SALUTATION:

This is a reminder that your account is now 120 days overdue. We would appreciate your rapid consideration in this matter. If you are unable to pay the full amount, please contact our office so we may construct a payment schedule.

Thank you,

Widget Works  
254 Widget Lane  
Marketington, MI 02134

\*ACCOUNT  
\*ADDRESS 1  
\*ADDRESS 2  
\*ADDRESS 3  
\*ZIP

### Figure 11.3 Memo Mailer Boilerplate

---

Makes life a bit easier, doesn't it? Here's an idea that will make filling in those variables a snap. Your word processor has a Search-and-Replace function. This function will search through your text for a word or phrase

that you specify and then replace it with another word or phrase of your choosing.

You can use this for replacing the variables in a boilerplate letter. This is especially helpful in letters like Figure 11.2 where a variable is used multiple times. Here the variables \*APPLICANT and \*POSITION are used twice. It would be quicker to have your Atari computer look for each occurrence of the variable, \*APPLICANT, and replace it with Sebastian L. Katt than to move the cursor to each variable and type over it.

In Atariwriter, the Search-and-Replace function works like this:

```
SELECT S
SEARCH FOR: *APPLICANT
REPLACE WITH: Sebastian L. Katt
REPLACE GLOBAL Y/N? Y
```

PaperClip does it like this:

```
CTRL + SHIFT - S
Global Substitute <Y/N> Yes
Include files also? <Y/N> No
Substitute? Sebastian L. Katt
for? *Applicant
More? No
```

## MAIL MERGING

When you're sending out a great number of form letters, the fastest way to "fill in the blanks" is to perform what is called a "mail merge." This is a process where your Atari computer automatically replaces the variables in each of the letters. It merges the information from a data file which holds the name, address, and account numbers of each recipient with the form letter and prints personalized letters one at a time.

A mail merge is not necessarily the answer to every application. It must be remembered that all of the information in the data file must be input into the file before it can be merged with the letter. If this mass mailing is a one-time-only situation, it might be just as easy to enter the information directly into the letters. If there is a chance that this list of people could be used more than once, however, it would be time efficient to enter them into a data file and let the machines do the work.

Mail merges differ in how they work. Some require a database program into which the fields of information is input. These are generally more efficient because you can then access any or all of the information in the database record as desired.

Other mail merge systems, as with PaperClip, don't require another program. They allow you to enter the necessary information into a file using the word processor and use that for the data file. Each field of information is then plucked out of the data file in order. This style is a bit more limiting because it does not allow random access of the information. Only fields that will be used in the letter may be included in these data files and they must be arranged in the exact order in which they will be used. This means that unless the second letter will use the fields exactly as the first letter, the data file must be modified before using it.

PaperClip uses two files: a Mail Merge File which is a data file containing information fields, and the Form Letter.

The Fill File is created on an empty screen the same in the type of information that might be included in a Mail Merge File:

```
Sebastian L. Katt
123 Kitty Litter Walk
Kittytown, CT 12345
Mr. Katt
Mouse Designer
Mouse Designer
Thomas I. Lion
34 Jungle Drive
Treetown, CA 99993
Mr. Lion
```

Mouse Designer  
Mouse Designer

Having completed these fields, save them onto diskette under the name of **MAILLIST**.

CTRL + SHIFT - W <D1:MAILLIST>

The Form Letter is also written on an empty screen. It is exactly the same as many of the previously discussed styles of letters, except CTRL - Z <M> is inserted wherever you want to insert a line from the data file.

Here is an example of a Form Letter you might create that can access the names in your MAILLIST data file:

---

CTRL - Z <M>

CTRL - Z <M>

CTRL - Z <M>

CTRL - Z <M> :

Thank you for your application for the position of CTRL - Z

M. Unfortunately, the softening market dictates that we must

alleviate some of our positions and CTRL - Z <M> has received the  
proverbial as.

We will contact you immediately if this position reopens.

Sincerely.

Ida Hvre

Personnel Manager

#### Figure 11.4 Form Letter

---

This is how the first letter would look when printed out:

---

Sebastian L. Kett

123 Kitty Litter Walk

Kittytown. CT 12345

Dear Mr. Kett:

Thank you for your application for the position of Mouse

Designer, Unfortunately, the softening market dictates that we  
must alleviate some of our positions and Mouse Designer has

---

received the proverbial ax.

We will contact you immediately if this position reopens.

Sincerely,

Ida Hvre

Personnel Manager

### Figure 11.5 Form Letter Filled In

---

Atariwriter doesn't offer the capability of merging the information from a data file with a form letter to produce a mass mailing. It does, however, allow you to enter the desired information as the form letters are printed. This means you can still personalize form letters without having to retype each one individually.

Instead of typing CTRL - Z <M> where you want to insert the data, leave a blank and press OPTION INSERT. OPTION INSERT will leave an inversed character to indicate the need for data to be added while printing. When Atariwriter prints the file, it will stop when it encounters the inversed character and prompt you to MAKE ENTRY, PRESS RETURN.

Once you have your letters written, you must address the envelopes. Most offices rely on the faithful old typewriter for addressing envelopes. It's usually too much trouble to set up a word processor to print envelopes., In answer to this problem, I have included a program called the Envelope Addresser written especially for the Epson printer.

## THE ENVELOPE ADDRESSER

Computers are terrific when it comes to writing business letters but they can't always complete the job.

A word processor like Paper Clip will make it fast and easy to write a closing letter to your latest client. Your Epson printer's NLQ type style will give your correspondence a professional appearance. But when it comes time to address the envelope and mail it off, it's usually time to pull out the old typewriter.

The Envelope Addresser is a program that will allow you to use your Epson printer to cure this common dilemma. It's designed to make envelope addressing easy. It will accommodate standard or legal-sized envelopes. You may use the Envelope Addresser to print an address on one envelope or on twenty. However you use it, the Envelope Addresser should make your correspondence easier.

## HOW IT WORKS

The Envelope Addresser begins by asking for the size of envelope you will be addressing-standard or legal. A standard envelope is 3 5/8" x 6 1/2" and a legal-sized envelope is 4 1/8" x 9 1/2".

The next question to answer pertains to the number of lines in your address. The typical address is composed of three lines but this program will accommodate up to six lines of text.

Now it's time to enter the address. The prompt for the first line is "#1 ?". Start typing your first line at the cursor. If the addressee of the letter happens to have a name that exceeds 32 letters, the cursor will drop to the next line on the screen. That's OK, as long as the name fits on the envelope. When you have completed the first line, press RETURN and begin on the next line.

Once you have typed in your address, the program will ask if all of the lines are correct. This is your chance to correct any mispunched keys. A "Y" answer to this question will take you straight to the printing part of the program. If you made a mistake, however, the program will ask you for the line number and give you a second shot at doing it correctly.

The program is now asking how many copies of this envelope you want to print. This feature is included in case you have a client, friend or company you contact frequently and would like to make a cache of printed

envelopes. This way you don't have to type in the address each time. All you need to do is insert new envelopes into your Epson printer.

After selecting a number of envelopes to print, the print prompt will appear. It tells you to line up the top of your envelope with the paper bail on your Epson printer. In case you forgot what the paper bail is, it's the horizontally-mounted metal rod on your printer that holds your paper (or envelope) against the platen.

Before you begin printing, you might want to use the Selectype feature to choose a specific type face for printing your envelopes. After you have done this by following the procedures outlined in Chapter 4, press RETURN and your Epson printer will come to life.

While you're in the middle of printing one of your first envelopes, your Epson printer may suddenly stop printing and start beeping. Fear not! Your electronic scribe has not taken-up singing instead of signing. It is merely indicating that it thinks it's run out of paper. There's a switch behind the platen that flips when there isn't any paper holding it down. An envelope is only about 4 inches high and while it's merrily printing away, your Epson printer is worrying about being all out of paper.

You can fool it into forgetting about such trivial problems by using a DIP switch in the back of your printer. Consult your manual for the DIP that will deactivate the paper end detector.

The Envelope Addresser will wait in between envelopes for you to position the next one. When you have finally typed all of your envelopes, it will ask if "You want to print more of these envelopes (Y/N)?". This can act as a labor-saving device if you suddenly realize that you'd like to print some additional envelopes. You don't have to type the address again. It's also quite handy if you want to print a test envelope before doing a large number. Begin by indicating that you only want to print one envelope. If it turns out to be acceptable, you can then prepare for printing another couple of dozen.

If you don't want to print more of the same, answer "N." You'll then be queried as to whether you want to print another set of envelopes. This is a means for getting back to the beginning of the program in order to print other additional envelopes. Answer "Y" and you're back to square one. Answer "N" and the program will bid you a fond farewell.

---

```
10 REM SAVE"D1:ADDRESSR"
20 REM * * ADDRESSES ENVELOPES * *
25 CLR
30 DIM E$(1),S$(30),S1$(30),S2$(30),S3$(30),S4$(30),S5$(30),S6$(30),Z$(1)
100 PRINT CHR$(125)
110 POSITION 8,1:PRINT "THE ENVELOPE ADDRESSER"
120 PRINT :PRINT " THIS PROGRAM WILL ADDRESS STANDARD-"
130 PRINT " OR LEGAL-SIZED ENVELOPES ON YOUR"
140 PRINT "     EPSON PRINTER."
150 PRINT :PRINT "ARE YOU USING STANDARD OR LEGAL-SIZED"
160 PRINT "ENVELOPES (S,L) " ;:INPUT E$
170 IF E$="S" OR E$="L" THEN GOTO 200
180 GOTO 100
200 PRINT
210 PRINT "#1: " ;:INPUT S1$:IF S1$="" THEN 240
215 PRINT "#2: " ;:INPUT S2$:IF S2$="" THEN 240
220 PRINT "#3: " ;:INPUT S3$:IF S3$="" THEN 240
225 PRINT "#4: " ;:INPUT S4$:IF S4$="" THEN 240
230 PRINT "#5: ' " ;:INPUT S5$:IF S5$="- ' THEN 240
235 PRINT "#6: " ;:INPUT S6$:IF S6$="" THEN 240
240 PRINT :PRINT " ARE THESE LINES CORRECT (Y/N) " ;:INPUT Z$
250 IF Z$="Y" THEN GOTO 300
260 PRINT :PRINT "WHICH NUMBERED LINE NEEDS CORRECTING " ;:INPUT C
270 IF C<1 OR C>6 THEN 260
280 PRINT "# " ;C ;:INPUT S$
282 IF C=1 THEN S1$=S$
283 IF C=2 THEN S2$=S$
284 IF C=3 THEN S3$=S$
285 IF C=4 THEN S4$=S$
286 IF C=5 THEN S5$=S$
287 IF C=6 THEN S6$=S$
290 GOTO 240
300 PRINT CHR$(125):PRINT :PRINT " HOW MANY COPIES OF THIS ENVELOPE"
310 PRINT "     DO YOU WISH TO PRINT " ;:INPUT P
320 OPEN #1,8,0,"P:"
330 FOR R=1 TO P
332 PRINT :PRINT :PRINT "LINE TOP OF ENVELOPE WITH PRINTHEAD"
```

```

333 PRINT :PRINT " PRESS RETURN TO START PRINTING";
334 INPUT Z$
339 FOR M=1 TO 7:LPRINT :NEXT M
340 IF E$="S" THEN P=20
343 IF E$="L" THEN P=40
345 FOR M=1 TO P:PRINT #1;" ";:NEXT M:PRINT #1;S1$
348 FOR M=1 TO P:PRINT #1;" ";:NEXT M:PRINT #1;S2$
350 FOR M=1 TO P:PRINT #1;" ";:NEXT M:PRINT #1;S3$
353 FOR M=1 TO P:PRINT #1;" ";:NEXT M:PRINT #1;S4$
355 FOR M=1 TO P:PRINT #1;" ";:NEXT M:PRINT #1;S5$
360 FOR M=1 TO P:PRINT #1;" ";:NEXT M:PRINT #1;S6$
370 FOR T=1 TO 6:LPRINT :NEXT T
400 NEXT R
410 CLOSE #1
420 PRINT :PRINT :PRINT " DO YOU WANT TO PRINT MORE"
430 PRINT " OF THESE ENVELOPES (Y/N)";
435 INPUT Z$
440 IF Z$="Y" THEN 300
450 PRINT :PRINT " DO YOU WANT TO PRINT ANOTHER"
460 PRINT " SET OF ENVELOPES (Y/N)";
465 INPUT Z$
470 IF Z$="Y" THEN 25
480 PRINT :PRINT :PRINT " YOU SEND ME . . .
490 END

```

**Figure 11.6 Listing of The Envelope Addresser**

## HOW TO MODIFY THE PROGRAM

Certain parts of the program have been written to suit my tastes in addressing envelopes. If, however, your tastes don't exactly coincide with mine and you'd like to place the address differently on the envelope—here are some hints for modifying the Envelope Addresser.

The distance from the top of the envelope to the first line is programmed to be 1 1/6 inches or 7 lines. If you would like to move the address up or down on the envelope, find line 339 which states:

```
339 FOR M=1 TO 7:LPRINT : NEXT M
```

This tells the printer to advance seven lines before printing the first line. If you wish the address to begin higher on the envelope, change the seven to a smaller number. If you wish it to begin lower on the envelope, increase the seven.

You may also want to move the address horizontally. To do this, you must alter lines 340 and 343.

```
340 IF E$ = "S" THEN P = 20
343 IF E$ = "L" THEN P = 40
```

These lines dictate how far to the right the print head will move in lines 345-360 before printing the address lines. To move the address to the right, increase the value of P. To move the address to the left, decrease P's value.

One final modification might be to tell your Epson printer to print the return address as well as the sending address on the envelope. Typing and retyping your return address could become a bit tedious, so let's "hard code" it into the program.

```
335 LPRINT; "Dr. William B. Byte"
336 LPRINT; "128 Code Avenue"
337 LPRINT; "Silicon City CA 90256"
```

This change may also require you to decrease the number seven in line 339 as mentioned a couple of paragraphs ago.

## BUILDING GRAPHS

You may also want to include graphic representations of the figures in a report. As mentioned in Chapter 8, it is these extras that will give your business communications an extra impact. The program below can be used for graphing annual income or annual expenses.

It will first ask for a title which is printed across the top in expanded print. Next it will ask how many years you intend to graph. It will then ask you to input each year along with the quantity to be graphed for that year. Finally, it will ask how much each unit in a bar should equal. This will allow you to alter the proportions in the graph.

---

```
10 REM SAVE "D1:BARCHART"
20 REM * * PRINTS VARIABLE BAR CHART * *
25 CLR
30 DIM G$(2),R$(1),T$(40),YR(20),Z$(1),Q(20)
99 PRINT CHR$(125)
100 PRINT "      ADJUSTABLE BAR CHART"
110 PRINT :PRINT "PLEASE ANSWER THESE QUESTIONS SO I "
120 PRINT "MAY PRINT A BARCHART ON YOUR PRINTER."
130 PRINT :PRINT "WHAT SHALL I TITLE THIS CHART ",
135 POSITION 5,8:INPUT T$
140 PRINT :PRINT "HOW MANY YEARS SHALL I DISPLAY ",
145 POSITION 5,12:INPUT Y
150 FOR R=1 TO Y
160 PRINT
170 PRINT "YEAR: ";:INPUT YR
175 YR(R)=YR
180 PRINT "QUANTITY: ";:INPUT Q
185 Q(R)=Q
190 NEXT R
200 PRINT
210 PRINT "HOW MUCH SHOULD EACH UNIT EQUAL ";:INPUT V
220 OPEN #1,8,0,"P:"
250 PRINT #1;CHR$(14);T$
255 LPRINT
260 FOR R=1 TO Y
270 PRINT #1;YR(R);"    ",
275 I=INT(Q(R)/V)
280 PRINT #1;CHR$(27);"K";CHR$(I+1);CHR$(0);
285 FOR S=1 TO I
290 PRINT #1;CHR$(255);
300 NEXT S
310 PRINT #1;" ";Q(R)
320 NEXT R
330 CLOSE #1
340 PRINT :PRINT :PRINT "WOULD YOU LIKE TO PRINT ANOTHER(Y/N)";
350 INPUT Z$
360 IF Z$="Y" THEN 25
370 END
```

**Figure 11.7 Listing of Barchart Program**

---

of the advice included in this chapter can reduce the amount of time you spend on paperwork and increase the time you can spend making money.

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)

Discover more

[Compensation & Benefits](#)[Printers](#)[Spreadsheet Software](#)[Computer Hardware](#)[spreadsheets](#)[Finance](#)[Software](#)

---

## Chapter 12

---

# Spreadsheets and Your Epson Printer

The use of spreadsheets with your Atari computer and Epson printer computer system was introduced in Chapter 7. If you haven't read that chapter yet, I suggest you read it before continuing with this chapter.

When microcomputers were introduced in the late 70s, they were given a lukewarm reception by the business world. They were viewed as hobbyists' machines which served little purpose in the real world of commerce.

Then came the advent of the electronic spreadsheet.

At last, the microcomputer could perform a useful function for the financial wizards. It could provide the controller with reports in a few minutes that used to take weeks to create. A great number of businessmen bought microcomputers for the sole purpose of running spreadsheet programs.

This chapter will cover the use of spreadsheets for inventory control, analysis of advertising campaigns and figuring wages from weekly timecards. These applications may appear simplistic at first, but they are only meant to work as models which can be expanded to fit your personal needs later.

## INVENTORY CONTROL

This first application will help you track the production, sale, and existing inventory of your products at the ABC Cookie Company. It is a rather straight-forward spreadsheet application. You'll notice some differences in the notation from Chapter 7. The format and replication commands are embedded within the set of commands. The first three replication commands are used to save time by copying the equations in row 7 throughout each of their respective columns in columns F, H, and I.

The last replication is used to copy the @SUMming equation in cell D14 to the rest of the cells in that row from columns D through I. Since the equation is not needed in cell G14, it is removed in the last line of commands.

```
>B1:Inventory
>C1:" Control
>D1:of the AB
>B2:C Cookie
>C2:Company
>A4:" Goods
>C4:Cost per
>D4:" Quant
>E4:" Quant
>F4:" Quant
>G4:" Unit
>H4:" Gross
>I4:" Net
>C5:" Unit
```

>D5:" Made  
>E5:" Sold  
>F5:In-Stock  
>G5:" Price  
>H5:" Income  
>I5:" Income  
>A7:Chocolate  
>B7:" Chip  
>C7:/F\$ .02  
>D7:900  
>E7:850  
>F7:+D7-E7  
>G7:/F\$ .05  
>H7:/F\$ +E7\*G7  
>I7:/F\$ +H7-C7\*D7

REPLICATE

/R: F7.F7: F8.F12: R R  
/R: H7.H7: HB.H12: R R  
/R: I7.I7: I8.112: R R R

>A8:Oatmeal  
>CB:/F\$ .01  
>D8:550  
>E8:375  
>G8:/F\$ .03  
>A9:Oatmeal/R  
>B9:aisin  
>C9:/F\$ .02  
>D9:500  
>E9:425  
>G9:/F\$ .05  
>A10:Peanut Bu  
>B10:tter  
>C10:/F\$ .01  
>D10:600  
>E10:125  
>G10:/F\$ .03  
>A11:Pecan  
>C11:/F\$ .03  
>D11:300  
>E11:275  
>G11:/F\$ .05  
>A12:Macaroon  
>C12:/F\$ .05  
>D12:300  
>E12:300  
>G12:/F\$ .10  
>B14:Total:  
>D14:/F\$ @SUM(D7.D12)

REPLICATE

/R: E14.I14: R R

>G14  
/B:

I14:/F\$

Save it to disk:

---

Inventory Control  
ABC Cookie Company

---

| Goods          | Cost per<br>Unit | Quant<br>Made | Quant<br>Sold | Quant<br>Instock | Unit<br>Price | Gross<br>Income | Net<br>Income |
|----------------|------------------|---------------|---------------|------------------|---------------|-----------------|---------------|
| Chocolate Chip | 0.02             | 900           | 850           | 50               | 0.05          | 42.50           | 24.50         |
| Oatmeal        | 0.01             | 550           | 375           | 175              | 0.03          | 11.25           | 5.75          |
| Oatmeal/Raisin | 0.02             | 500           | 425           | 75               | 0.05          | 21.25           | 11.25         |
| Peanut Butter  | 0.01             | 600           | 125           | 475              | 0.03          | 3.75            | -2.25         |
| Pecan          | 0.03             | 300           | 275           | 25               | 0.05          | 13.75           | 4.75          |
| Macaroon       | 0.05             | 300           | 300           | 0                | 0.10          | 30.00           | 15.00         |
| Total:         |                  | 3150          | 2350          | 800              |               | 122.50          | 59.00         |

**Figure 12.1 Inventory Control**

When you have completed entering these commands, you should have a spreadsheet that looks like the one in Figure 12.1. You may only be able to see four columns of your spreadsheet, but you'll discover the rest if you move your cursor around the screen.

If you aren't the adventurous type, you can print your spreadsheet out on your Epson printer to compare it with the one in Figure 12.1. Set your Epson printer to the NLQ print mode.

>A1 : /P P & H14:

Now watch your spreadsheet appear in printed form.

## COST ANALYSIS OF ADVERTISING COSTS AND RETURN

Another application you may find helpful is a spreadsheet template which will analyze your advertising costs and your return for the advertising dollar. You simply enter the Circulation, Size of the Ad, Insertion Cost, # of Insertions, and # of Responses. It will calculate your total cost, the cost of the ad in relation to the number of subscribers (cost/circulation ratio), and the cost of each response (cost/response ratio).

You'll notice a time-saving trick in this spreadsheet. After the format is entered in C10, it is replicated to cells D10 to F10. This prepares those cells for monetary entries. Although this was only applied to a few cells in this situation, it can save quite a bit of work when used on larger spreadsheets.

```

>B1:" Cost Ana
>C1:lysis of
>B2:XYZ Adver
>C2:tising Ca
>D2:mpaign
>D4:Magazines
>C6:"    Boy's
>D6:"    Kid's
>E6:"    Youth
>F6:"    Forever
>C7:"    Day
>D7:"    World
>E7:"    Week
>F7:"    Young
>A8:Circulati
>B8:on
>C8:6000
>D8:8200
>E8:2500
>F8:15000
>A9:Size of A
>B9:d(in.):
>C9:2
>D9:1
>E9:2

```

```
>F9:3
>A10:Insertion
>B10: Cost:
>C10: /F$

REPLICATE

/R: D10.F70 "

>C10:400
>D10:320
>E10:275
>F10:750
>A11:"# of Inse
>B11:"rtions
>C11:1
>D11:3
>E11:3
>F11:2
>A12" "===== ;
```

```
REPLICATE

/R: B12.F12

>A13:Total Cos
>B13:t
>C13:/F$ +C10*C11
```

```
REPLICATE

/R: D13.F13: R R

>A14:Cost/Circ
>B14: Ratio:
>C14:/F$ +C10/C8
```

```
REPLICATE

/R: D14.F14: R R

>A16:"# of Resp
>B16:onses:
>C16:95
>D16:105
>E16:86
>F16:256
>A17:Cost/Resp
>B17:onse:
>C17:/F$ +C13/C16
```

```
REPLICATE

/R: D17.F17: R R
```

Save it to disk:

---

Cost Analysis of  
XYZ Advertising Campaign

Magazines

---

|                  | Boy's<br>Day | Kid's<br>World | Youth<br>Week | Forever<br>Young |
|------------------|--------------|----------------|---------------|------------------|
| Circulation:     | 6000         | 8200           | 2500          | 15000            |
| Size of Ad(in.)  | 2            | 1              | 2             | 3                |
| Insertion Cost:  | 400.00       | 320.00         | 275.00        | 750.00           |
| # of Insertions: | 1            | 3              | 3             | 2                |
| =====            |              |                |               |                  |
| Total Cost:      | 400.00       | 960.00         | 825.00        | 1500.00          |
| Cost/Cir Ratio:  | 0.07         | 0.04           | 0.11          | 0.05             |
|                  |              |                |               |                  |
| # of Responses:  | 95           | 105            | 86            | 256              |
| Cost/Response:   | 4.21         | 9.14           | 9.59          | 5.86             |

**Figure 12.2 Advertising Cost Analysis**

Print your spreadsheet to see if it matches Figure 12.2:

>A1: / P P & F17:

## TIMECARD

One of the most tedious but necessary tasks in running a business is calculating wages from timecards. This template will total an employee's weekly hours, calculate the amount of overtime (if there is any), and then multiply these hours by the appropriate rates to reach the total wages due that employee for the week.

The number of hours in a full work week is entered in cell B2. All hours worked up to and including this amount, are multiplied by the employee's rate of pay to arrive at a level of compensation. The template then calculates the number of overtime hours worked from Monday through Friday. Since these overtime hours are compensated at a wage of "time and a half," they are multiplied by a factor of 1½ times the employee's rate. The overtime accrued on the weekend is "double time." It is calculated differently at a rate of two times the employee's rate. The sum of all three of these totals is then placed in column Q for the Total Wages due the employee.

You'll notice two new things in this spreadsheet application. First, cell K6 reads IFJ6>B2THENB2ELSEJ6. This is a conditional statement used to define the value of K6. It states that if the value in J6 is greater than that of B2 then make K6 equal to B2. The ELSE completes the statement by stating that if J6 is not greater than B2 then the value of K6 should be made equal to J6.

This conditional statement is a simple way of determining the number of hours the employee has worked as regular time. It states that if the total number of hours worked Monday through Friday is at least equal to the total number of hours expected in cell B2 then the total for K6 will equal the number in B2. This eliminates the need for messy calculations.

The other new spreadsheet tool is the replication procedure used after Q6. It is a process where all of the hours and/or formulas in row 6 are replicated to rows 7 through 15. As you do it, you'll appreciate the amount of time that can be saved using this procedure.

>A1:" Week of  
 >B1:" August  
 >C1:"3 - 9  
 >A2:" Hours:  
 >B2:40  
 >B3:" Date:  
 >C3:3  
 >D3:4  
 >E3:5  
 >F3:6  
 >G3:7  
 >H3:8  
 >I3:9  
 >J3:" Total  
 >K3:" Regular  
 >L3:" Regular

```

>M3:"Overtime
>N3:" O.T.
>O3:"Overtime
>P3:" O.T.
>Q3:" Total
>A4:Employee
>B4:" Rate
>C4:" Mon
>D4:" Tues
>E4:" Wed
>F4:" Thurs
>G4:" Fri
>H4:" Sat
>I4:" Sun
>J4:" Hours
>K4:" Hours
>L4:" Wages
>M4:" (1 1/2X)
>N4:" Wages
O4:" (2 X)
>P4:" Wages
>Q4:' Wages
>A6:Anderson :

/ G R M (Recalculate Manually)

```

```

>B6:/F$ 5.75
>C6:8
>D6:8
>E6:8
>F6:8
>G6:8
>H6:0
>I6:0
>J6:@SUM(C6.I6)
>K6:IFJ6>B2THENB2ELSEJ6
>L6:/F$ +K6*B6
>M6:@SUM(C6.G6)-K6
>N6:/F$ +M6*(1.5*B6)
>O6:+H6+I6
>P6:/F$ +O6*(2*B6)
>Q6:/F$ +L6+N6+P6

```

REPLICATE

```

/R [backspace] C6.I6 : C7 to C15 replicates 8 hours
/R [backspace] J6.Q6 : J7 to J15 <R> R R/R N N R/R R/R R R/R R/R
R/R R/R R R

```

You'll notice when all of the replication is through, your columns will contain identical numbers. That's because you turned off the automatic recalculation function. Use /G R A to turn it back on and watch everything change. Remember to use /G R M to turn it back off to allow you rapid number entry.

```

>A7:Buril
>B7:/F$ 6.95
>D7:9
>F7:9
>H7:9
>I7:8
>AB:Deland
>BB:/F$ 8.56
>C8:7
>G8:6
>A9:Foster
>B9:/F$ 7.25
>H9:4
>A10:Holland
>B10:/F$ 9.76

```

```

>A11:Hug
>B11:/F$ 9.01
>C11:9
>E11:10
>H11:8
>A12:Jones
>B12:/F$ 5.50
>C12:4
>D12:0
>F12:4
>G12:0
>A13:Kahn
>B13:/F$ 8.57
>A14:Klink
>B14:/F$ 11.54
>A15:Zeitz
>B15:/F$ 12.00
>C15:9
>E15:10
>F15:9
>H15:8
>I15:3

```

/G R A (Automatically Recalculates the Equations)

Save it to Disk:

/ S S TIMECARD <R>

This spreadsheet is quite wide (136 space wide) so you will have to print it in two parts. The first half will include columns A through I. This will display the Employee, Rate, and Hours for the week.

Remember to set your printer to NLQ before printing.

>A1: / P P & 115:

Now print the second half of the spreadsheet:

>J1: / P P & Q15:

---

Week of August 3 - 7

Hours: 40

|          | Date: | 3   | 4    | 5   | 6     | 7   | 8   | 9   |
|----------|-------|-----|------|-----|-------|-----|-----|-----|
| Employee | Rate  | Mon | Tues | Wed | Thurs | Fri | Sat | Sun |
| Anderson | 5.75  | 8   | 8    | 8   | 8     | 8   | 0   | 0   |
| Buril    | 6.95  | 8   | 9    | 8   | 9     | 8   | 9   | 8   |
| DeLand   | 8.56  | 7   | 8    | 8   | 8     | 6   | 0   | 0   |
| Foster   | 7.25  | 8   | 8    | 8   | 8     | 8   | 4   | 0   |
| Holland  | 9.76  | 8   | 8    | 8   | 8     | 8   | 0   | 0   |
| Hug      | 9.01  | 9   | 8    | 10  | 8     | 8   | 8   | 0   |
| Jones    | 5.50  | 4   | 0    | 8   | 4     | 0   | 0   | 0   |
| Kahn     | 8.57  | 8   | 8    | 8   | 8     | 8   | 0   | 0   |
| Klink    | 11.54 | 8   | 8    | 8   | 8     | 8   | 0   | 0   |
| Zeitz    | 12.00 | 9   | 8    | 10  | 9     | 8   | 8   | 3   |

---



---

| Total<br>Hours | Regular<br>Hours | Regular<br>Wages | Overtime<br>(1 1/2X) | O.T.<br>Wages | Overtime<br>(2 X) | O.T.<br>Wages | Total<br>Wages |
|----------------|------------------|------------------|----------------------|---------------|-------------------|---------------|----------------|
| 40             | 40               | 230.00           | 0                    | 0.00          | 0                 | 0.00          | 230.00         |
| 59             | 40               | 278.00           | 2                    | 20.85         | 17                | 236.30        | 535.15         |
| 37             | 37               | 316.72           | 0                    | 0.00          | 0                 | 0.00          | 316.72         |
| 44             | 40               | 290.00           | 0                    | 0.00          | 4                 | 58.00         | 348.00         |
| 40             | 40               | 390.40           | 0                    | 0.00          | 0                 | 0.00          | 390.40         |
| 51             | 40               | 360.40           | 3                    | 40.55         | 8                 | 144.16        | 545.11         |
| 16             | 16               | 88.00            | 0                    | 0.00          | 0                 | 0.00          | 88.00          |
| 40             | 40               | 342.80           | 0                    | 0.00          | 0                 | 0.00          | 342.80         |
| 40             | 40               | 461.60           | 0                    | 0.00          | 0                 | 0.00          | 461.60         |
| 55             | 40               | 480.00           | 4                    | 72.00         | 11                | 264.00        | 816.00         |

**Figure 12.3 Timecard**

These three spreadsheet applications are just a sampling of the types of timesaving processes which can be created. You no doubt already have a few ideas in mind and there are a great number of spreadsheet application books on the market.

Another source for spreadsheet applications is other spreadsheet users. Sometimes it's tough to meet others who have the same computer, software or problems as you. The next chapter discusses an emerging form of communication between computerists called "Telecomputing." It will allow you to ask an Atari owner in Bangor, Maine about a spreadsheet problem while you sit in your office in Seattle, Washington.

Welcome to the Electronic Universe.

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)

---

## Chapter 13

---

# Telecomputing and Your Epson Printer

You've spent 12 chapters learning about using your Atari computer with your Epson printer. You've learned how to use a word processor to prepare shopping lists, reports and business letters. You've seen how a database can help in preparing recipes and doing research. You've even used a spreadsheet to make working with numbers easier. A personal computer system can do many things to make your life easier and more productive.

Your Atari computer is a powerful machine, but it's limited. It only has only 64K of Random-Access Memory. Imagine its capabilities if you could tap into some of the multimillion-dollar computers around the world. Well, you can and many people do. We live in the Information Age where information is one of our most valuable commodities. Telecomputing is a way for every computer owner to have access to and exchange vast amounts of information over the telephone lines.

This is the Electronic Universe. It's composed of thousands of computers, big and small, connected by wires and satellites. Together they form a network of shared resources that spans the globe.

### WHAT IS TELECOMPUTING?

Mention telecomputing to most people and they immediately envision a bespeckled teenager hunched over his computer in the middle of the night breaking into the Pentagon's computers. There's no denying this is a part of the electronic universe, but only a small part.

Members of the network come in all sizes, shapes and ages. Many of them tend to work at night, but only because the rates are cheaper. Some are computer engineers and businessmen, but others are housewives and students. They use the network for business, education, and just plain recreation.

You can join this group of computer enthusiasts for less than a hundred dollars. Imagine using your computer system to pay your monthly bills, read the latest news developments, access up-to-the-minute stock quotes, make plane reservations, purchase a dishwasher, swap programs with another computer owner in Tulsa, Oklahoma, or even ask questions of Atari Inc. about your Atari computer. All of these services are available when you hook your Atari computer system to the electronic network.

### WHAT'S OUT THERE?

It's estimated there are more than 1500 electronic databases operating today carrying information on every conceivable subject. The choice of systems to which you can connect range from the financial database run on a large mainframe computers by a multimillion-dollar company to the electronic bulletin board operated by the school teacher on his Atari computer in the back bedroom. If there's an interest, chances are there's an electronic database somewhere catering to that interest.

Big or little, these systems can be roughly divided into groups. These groups are by no means complete but they are a way to breakdown the field.

- 1) The Electronic Utilities
- 2) Computer Bulletin Board Systems
- 3) Specialized Business and News Databases
- 4) Reference Databases
- 5) Electronic Shopping

There are three databases that presently fit the description of "Electronic Utilities." These are The Source, CompuServe, and Dow Jones News/Retrieval. They fit the title because of the wide selection of information and services that they provide for the public. Each contains comprehensive information on a wide selection of topics as well as providing services like banking, shopping, interactive gameplaying, conferencing and the like.

Electronic utilities are subscription services. They charge a fee for signing on to the system (called "connect time"). Once on the system, there are many opportunities available at no additional cost but some of the services cost an additional fee over and above the connect time charge.

"Free" time (usually an hour) and a free initial subscription to these utilities is often packaged with computer products. This is a good inducement to sign onto the system and just enough time to get you hooked into using their utility.

Computer Bulletin Board Systems (CBBS) are at the other end of the spectrum from the utilities. They are often run on home computers by individuals who label themselves SYSOPs (SYStem OPeratorS). CBBSs are not as polished as the utilities but the best thing about them is they're FREE.

These electronic bulletin boards were originally designed as systems for leaving messages like the boards in front of supermarkets. Many now offer various types of information on isolated areas of interest, i.e., coins, science fiction, adventure gaming, or specific computer hardware. They provide articles, tutorials, rumors, and public domain software pertaining to their topic.

CBBSs are good for cutting your telecomputing teeth when you're first learning about using your computer on the telephone lines. These free boards allow you to familiarize yourself with your equipment before signing onto an electronic utility where you have to pay for the time you spend making mistakes.

If you're interested in finding a bulletin board near you, call the Novation board at (818) 881-6880 using your computer. When you see the prompt type CAT. This board will provide a list of CBBSs all over the continental United States as well as some tutorials on telecomputing.

Specialized Business and News Databases include databases like the New York Times Information Service and NewsNet. The New York Times Information Service provides the complete New York Times newspaper on-line along with abstracts of other publications. NewsNet provides electronic versions of almost 200 industry and professional publications.

Reference Databases provide topic-specific searches of professional or scientific literature. These systems, ORBIT, DIALOG, and BRS will search 175 databases for information pertaining to medicine, law, education and, yes, even computers.

Electronic Shopping is best thought of as on-line catalog shopping. Comp-U-Store is a service that provides discount shopping in the comfort of your own computer room. It can be contacted directly as well as through all three of the information utilities.

The variety of services available through your computer is simply overwhelming and it's safe to say this field is still in its infancy. The question burning in your mind must be "How can I get involved?" That's a good question. Let's see what you need to get started.

## **WHAT DO I NEED FOR TELECOMPUTING?**

Outfitting your Atari computer for telecomputing is amazingly simple. In addition to your computer system, you only need three things - a modem, a communications software package, and a telephone line.

## **COMMUNICATING THROUGH YOUR COMPUTER**

Your computer is communicating all of the time. It sends messages to the monitor, the disk drive, and your Epson printer. This communication is achieved through a flow of electricity. Your computer uses sequences of turning on and turning off electricity to represent letters and characters much in the same fashion as Morse Code uses dots and dashes.

Each of the on or off signals is called a "bit." It takes eight of these signals, or bits, to represent a character that you might see on the screen or print through your printer. Flowing electricity doesn't make noise, but if you

could hear bits as they passed by you would hear a series of clicks and pauses.

Telephone lines are designed to carry sound. Before a computer can send messages over telephone lines, the bits must first be transformed into sound. This is called "Modulation." When a computer receives modulated signals over the wires, it must "Demodulate" the signals back into electrical impulses so that it can understand the message.

Modem stands for "MODulation - DEModulation." It modulates the signals into sound for transmission and demodulates sound transmissions back into an electrical so they may be used by the computer. The modem is your passport to telecomputing.

## WHAT'S IN A MODEM?

Modems can be divided into two categories: "acoustic couplers" and "direct-connect." These categories refer to the manner in which the modem is connected to the telephone lines. An acoustic coupler modem has a set of rubber cups which fit the receiver of a telephone. The modulated sound is exchanged through the telephone receiver in much the same way as we use the receiver to exchange language. The transmission is done through the mouthpiece and the "listening" is done through the earpiece. A direct-connect modem, on the other hand, connects directly to the telephone jack through the use of a modular telephone cord. It bypasses potential problems with the phone equipment and eliminates the possibility of outside sound interference. This direct line into the information stream has made the direct-connect modem very popular.

The acoustic coupler modem used to be less expensive, but that's no longer the case. The acoustic coupler does provide one advantage, however, and that is its mobility. Because of its design, it can be used almost anywhere on any phone.

Modems have differences in speed as well as means of connection. Data transfer over a modem is measured in "baud rate." Although it is not exactly correct, the generally accepted definition of baud is "bit per second."

I have already explained that there are eight bits for every character or byte. The process of transmitting information requires that an additional bit or two (depending upon the system) be added to each set of eight bits to compose a character. This means that a transmitted character is approximately 10 bits long.

Modems for microcomputers generally function at 300 and/or 1200 baud. This can be translated into about 30 to 120 characters per second. Recently 2400 baud modems have been released for micros but not many of the information utilities or services are supporting that speed yet.

What speed is right for you? 300 baud is the most popular. If you plan to keyboard most of your communications over the telephone lines then it will be more than enough. If you plan to use your modem for sending large amounts of information like book chapters or prewritten programs then you should invest in 1200. Database charges for 1200 baud are typically double what they charge for 300 baud but you're transmitting four times as much information.

Communicating through a modem is generally a give-and-take proposition. This means that it originates information some of the time and answers (receives) the rest of the time. Some modems only work in the originate mode, but this is more the exception than the rule. When you are selecting a modem, make sure it has both the originate and answer modes.

Some modems can both originate and answer simultaneously while others can only do one at a time. These forms of communication are called full-duplex and half-duplex communication respectively. You will have the greatest versatility if you choose a modem with full-duplex capabilities.

Other features that you might look for in a modem are indicator lights to inform you about what's happening; a speaker so that you can listen to the action as it dials and connects; self-testing diagnostics; and even the "auto-answer" and "auto-dial" capabilities to make your system easier to use.

There is a wide range of modems on the market expressly for the Atari computer. These include the Atari 1030 and XM 301 by Atari, the HabaModem by Haba Systems, and the MPP1000E Modem by Microbits, to name just a few. They range in price from about \$50 to \$250 depending upon their capabilities.

## COMMUNICATIONS SOFTWARE

The modem is a piece of hardware for telecomputing, but it requires software to make it usable. Communications software has the ability to turn your computer into a terminal. It will ensure that your system is communicating through ASCII and that the information is flowing through the RS-232 serial port. It will also allow you to modify the communications parameters like baud rate, parity sense, word length, number of stop bits and so on. It's not necessary that you understand what these things are beyond the fact that they are variable settings that

will allow your modem to communicate with other systems.

There are three areas that must be considered when selecting a communications package.

- 1) Uploading and Downloading capability
- 2) Ease in setting, changing and using parameters
- 3) Bells and Whistles.

The terms "Uploading" and "Downloading" deal with the transmission of information. Uploading a file onto another system means that you are taking the contents of a file from a disk on your computer and transmitting it over the lines to another computer. Downloading is the opposite process where a file from another computer is sent to your computer where you can use it, read it, print it or store it on one of your disks.

This feature will allow you to prepare a document while you're off-line and then send it into the communications stream directly from its storage file without having to retype it. Such a capability will save you time as well as money when you're connected with a database that charges you by the minute of connect time.

Downloading usually involves your accepting information into a buffer and then saving the contents of that buffer into a file on disk. Think of a buffer as a holding tank where information can be stored momentarily. A buffer which holds about 48,000 characters will accommodate roughly 16 full-pages of text (50 60-space lines to a page).

Setting parameters with your communications software is another important consideration. Parameters refer to the format or protocol with which information is exchanged over the phone lines. They include the baud rate, duplex mode, parity and the like. You should be able to change these settings quickly and easily with the touch of a key. Sometimes when you're roaming around within a database you may end up in an area which requires you to change protocol to download information and it would be most inconvenient to have to disconnect your system and call back later with your new settings.

The bells and whistles include the "extras" that make life a little easier. One of my favorites is autodial. This feature allows you to save a quantity of phone numbers (I've seen as many as 32) and have your software dial a number at the touch of a key. This is especially helpful when using 22-character phone numbers that include special access numbers and codes for using alternative long distance services.

Another preferable feature is found in the HomeTerm software in the HomePak package by Batteries Included. It is a Text Window. This is an out-going buffer which will allow you to enter up to 120 characters before transmitting. This is especially handy if you're conferencing with a number of other users on CompuServe and want to compose your messages unhampered by the scrolling conversation before sending it as a single unit.

Using macros is one way to save your keyboarding fingers. A macro is a set of characters or commands that can be generated by a single keystroke. This is handy for entering your password, ID code, or set of commands used frequently for entering a favorite part of a database. Many communications packages will allow you to define up to 20 keys with macros.

An automatic buffer-dump makes life much easier. This feature will automatically save the contents of your buffer to disk when it gets full. Without this feature, you must break from the program momentarily to manually save the buffer to disk. With the slow speed of the disk drives on the Atari computer this break can take as long as three minutes. At \$12.00 an hour that's 60 cents worth of connect time on a commercial database.

Selecting a good communications package is important. Most modems are sold with a package written especially for them, but that doesn't mean you're limited to using only that package. Look around. There are some public domain packages in the libraries on CompuServe and the Source. Download a couple of these and see how they work. Maybe you'll like them better than what you're presently using.

## TELEPHONE LINES

The last part of the telecomputing trilogy is the lifestream of the system itself, the telephone lines. The quality of these lines determines the quality of the transmission between computers.

Although many companies install dedicated telephone lines for computer transmission, it usually isn't necessary for use with microcomputers. You can just tap into your home line with a direct connect modem without any problem.

If you happen to live in an area where the telephone lines carry a great deal of interference you might find some problems transmitting at the higher baud rates. You shouldn't have any problem with 300 or even at 1200, but trying to transmit at 2400 baud and higher may induce an undesirable level of errors. There's really nothing you can do about this until the telephone company cleans up its act.

## FROM TELEPHONE LINES TO YOUR EPSON PRINTER

We haven't discussed much about your Epson printer's part in this electronic universe. The actual set-up and use of your Epson printer is the same whether its information is coming from a diskette in your drive or from another computer clear across the country.

In telecommunications, your Epson printer can be used in two ways. The first is to print data straight from the buffer. This means that your Atari computer has captured information from another computer in a part of its memory and you can make a printed copy of that information directly from the computer. The second way is to print from a file on diskette. The information in this file was originally captured in the buffer and then downloaded into a file on diskette. Once loaded onto diskette, the information is safe and can be printed at your leisure.

This second method is preferable unless there is a reason for you to have a printed copy of information while you're on-line. The reason for this choice is time. Your Epson printer can print between 80 and 200 characters per second while your disk drive can save information many times faster than that. The key to remember when living in the electronic universe is that time is money. Whether its time-connect charges or just long-distance telephone bills, the longer you spend on-line, the more expensive it will be.

Another advantage to saving the copy to diskette is that you can load the text into a word processor and keep only the parts you want. There are so many file identification lines and "Press <CR> for more" messages that get caught in a session, that it makes more sense to eliminate these before printing.

## WHAT'S A SIG?

A SIG is a Special Interest Group. Databases like CompuServe and The Source have hundreds of SIGs with interests ranging from aviation to travel, Atari computers to Zenith computers, and a wide variety of interests that will tickle anyone's fancy.

Each SIG has at least ten departments. These departments include electronic bulletin boards where you can read bulletins, access programs, leave and receive messages, even conference with other SIG members from all over the world. These options are similar in all of the SIGs, but it's how the SIG uses them that makes the difference between a good SIG and a bad one.

Since you're reading this book, I thought you'd be interested in some SIGs on CompuServe which deal specifically with Epson and Atari. There are two SIGs for Atari and one for Epson.

The two Atari SIGs include SIGATARI and ANTIC. SIGATARI is an interest group sponsored by Atari Inc. It allows you read announcements directly from the manufacturer as well as receive help from their technical people through the Atari Hotline. The ANTIC SIG is run by the publishers of Antic magazine. They provide the Atari Resource that is not tainted by the special interests of the company.

There is also a SIG in the form of an electronic magazine, EpsOnLine. Its sign-on from the main CompuServe Menu is GO EPSON. It is an extremely well-run SIG which possesses many of the same sections as the other SIGs, only it's directed specifically at Epson printers and computers.

All of these sections have data libraries. These libraries have public domain files which contain text and/or programs for the Atari machines which can be downloaded onto your system. Once you have saved these programs on diskette, you may use, modify or destroy them on your computer at will.

Another section common to all of these groups is the Conference Mode. This is where Atari users can meet together to exchange ideas, tips, rumors and just "shoot the bull." You can't fully achieve an understanding of the electronic universe's expanse until you sit in your office in Los Angeles and find that the person you've been swapping stories with for the last half-hour is in Atlanta. This is what futurists mean when they speak of computers making the world smaller.

This Conference Mode is my favorite part of these on-line services. In addition to the comradery that can be built in conversations with others in this section, it's like having a 24-hour helpline for computer problems.

I have been saved a number of times while writing this book. Typically, my greatest technical problems arise at around 11 pm. I'll be at a point where I can't continue until my question has been answered, but there's no one around to ask. My answer comes when I fire-up my modem and sign onto CompuServe. Entering SIGATARI, or EpsOnLine, I usually find a couple of knowledgeable users conferencing or a friendly SYSOP (SYStem OPERator) who can help me in my dilemma.

The SIGs in electronic utilities are probably the areas of most interest to the individual user, but there are many valuable applications for the computerized businessperson.

## DOING BUSINESS THROUGH TELECOMPUTING

The business possibilities for telecomputing are almost endless. As a resource, information utilities like Dow Jones News/Retrieval Service can provide you with the up-to-the-minute news about stocks, bonds and commodities. It puts the information you need at your fingertips.

Telecomputing also opens new vistas in communication for businesses. It provides a low-cost channel for sending information anywhere in the world. Instead of relying upon the postal mail service or a courier service, companies can send information directly over the phone or store it in an information depot on one of the information utilities where it can later be retrieved by the recipient.

As I have already discussed, telecomputing can provide a direct line to companies for customer support. Any time of the night or day a customer can leave a message or question for a customer support person. The next day the company person can retrieve that message and answer it. The help is almost immediate.

The opportunities telecomputing is bringing to business are just now beginning to be explored. Computer banking and computer shopping are realities which are already being offered. Some universities are now offering on-line classes which allow you to earn a degree without ever stepping on campus. Plugging your computer into a telephone line will bring you in touch with centers of information which were previously inaccessible.

You've investigated a wide variety of applications for your Epson printer and Atari computer. It is only the beginning. As you become more involved in the world of computing you will marvel at the possibilities. The biggest limitation to your computer's capabilities is a human's ability to tell it what to do.

Most importantly, as you grow-so will your computer system. You'll upgrade your system to more powerful computers and your Epson printer will be right there with you. As you change computers you're Epson printer will still be able to work as your fast and efficient Fingerprint in the world of printing.

Your Epson printer is an investment that will go far into the future.

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)

---

## Appendix A

---

# ASCII Code

ASCII (American Standard Code for Information Interchange), pronounced Ask-Key, is like Morse Code for the computer. There is no particular reason why number 65 should stand for A, but someone had to decide what stood for what. If you really get into it, you'll find very good reasons for certain relationships (the difference between capital A and lower case a, 65 versus 97, represents just one bit in a binary byte that is a 0 rather than a 1); this is why you may detect some patterns even if you are not a programmer.

Within the ASCII code, the numbers 32-126 produce printed characters, either on a screen or a printer. The numbers 0-31 and 127 are controls that cause some other activity on the part of either the printer or computer.

The original ASCII Code included some controls for early mainframe computers, which are not used for your micro (some of the codes are used for something else, others are just ignored), so the symbols for some of the non-printing characters may not be familiar to you.

The numbers from 128 to 255 are employed differently by different computers and printers. Check your manual, for example, to see if your printer uses 128-255 to repeat 0-127, or to print italics, or to hold an alternate character set, or graphics. Some can be programmed with characters you design.

The chart below shows the decimal value for codes 0-127, and the printed character, when there is one. For the non-printing controls, we've shown the ASCII abbreviation ("symbol" or "mnemonic") and its definition, as well as the keystroke(s) that will produce the code (on most computers, but not all). Again, these may not all be meaningful to you, but the next Appendix will give you a better idea of how to use them with your Epson printer.

The decimal number, used with the BASIC language command CHR\$-as PRINT CHR\$(65)-will produce the character or action in question. (If you happen to be using BASIC and want to know what CHR\$ number goes with a character, this will produce the answer: PRINT CODE "A".

NOTE: This is the standard ASCII character set, used by all Epson printers and most computers. Your Atari's character set is slightly different-see the manual. With the PIC, a HomeWriter-10 or LX90 will produce the computer's character set rather than this one. With another interface, in transparent mode, you'll get these characters-which means that what you see on the screen will be different from what the printer will print for a particular CHR\$ number.

| DECIMAL | SYMBOL | KEYBOARD                  | MEANING            |
|---------|--------|---------------------------|--------------------|
| 0       | NUL    | CTRL @ or<br>CTRL SHIFT P | Null               |
| 1       | SOH    | CTRL A                    | Start of Heading   |
| 2       | STX    | CTRL B                    | Start of Text      |
| 3       | ETX    | CTRL C                    | End of Text, BREAK |

|     |     |              |                              |
|-----|-----|--------------|------------------------------|
| 4   | EOT | CTRL D       | End of Transmission          |
| 5   | ENQ | CTRL E       | Enquiry                      |
| 6   | ACK | CTRL F       | Acknowledge                  |
| 7   | BEL | CTRL G       | Sound bell or buzzer         |
| 8   | BS  | CTRL H       | Backspace                    |
| 9   | HT  | CTRL I       | Horizontal tab               |
| 10  | LF  | CTRL J       | Line feed                    |
| 11  | VT  | CTRL K       | Vertical tab                 |
| 12  | FF  | CTRL L       | Form feed                    |
| 13  | CR  | CTRL M       | Carriage return              |
| 14  | SO  | CTRL N       | Shift Out                    |
| 15  | SI  | CTRL O       | Shift In                     |
| 16  | DLE | CTRL P       | Data Link Escape             |
| 17  | DC1 | CTRL Q       | Device Control 1, Reader On  |
| 18  | DC2 | CTRL R       | Device Control 2, Punch On   |
| 19  | DC3 | CTRL S       | Device Control 3, Reader Off |
| 20  | DC4 | CTRL T       | Device Control 4, Punch Off  |
| 21  | NAK | CTRL U       | Negative Acknowledge         |
| 22  | SYN | CTRL V       | Synchronous Idle             |
| 23  | ETB | CTRL W       | End of Transmission Block    |
| 24  | CAN | CTRL X       | Cancel                       |
| 25  | EM  | CTRL Y       | End of Medium                |
| 26  | SUB | CTRL Z       | Substitute                   |
| 27  | ESC | CTRL SHIFT K | Escape                       |
| 28  | FS  | CTRL SHIFT L | File Separator               |
| 29  | GS  | CTRL SHIFT M | Group Separator              |
| 30  | RS  | CTRL SHIFT N | Record Separator             |
| 31  | SP  | Space bar    | Space, blank                 |
| 127 | DEL | DELETE       | Delete                       |

| CHR\$ | CHAR | CHR\$ | CHAR | CHR\$ | CHAR |
|-------|------|-------|------|-------|------|
| 33    | !    | 65    | A    | 97    | a    |
| 34    | "    | 66    | B    | 98    | b    |
| 35    | #    | 67    | C    | 99    | c    |
| 36    | \$   | 68    | D    | 100   | d    |
| 37    | %    | 69    | E    | 101   | e    |
| 38    | &    | 70    | F    | 102   | f    |
| 39    | '    | 71    | G    | 103   | g    |
| 40    | (    | 72    | H    | 104   | h    |
| 41    | )    | 73    | I    | 105   | i    |

|    |   |    |   |     |   |
|----|---|----|---|-----|---|
| 42 | * | 74 | J | 106 | j |
| 43 | + | 75 | K | 107 | k |
| 44 | , | 76 | L | 108 | l |
| 45 | - | 77 | M | 109 | m |
| 46 | . | 78 | N | 110 | n |
| 47 | / | 79 | O | 111 | o |
| 48 | 0 | 80 | P | 112 | p |
| 49 | 1 | 81 | Q | 113 | q |
| 50 | 2 | 82 | R | 114 | r |
| 51 | 3 | 83 | S | 115 | s |
| 52 | 4 | 84 | T | 116 | t |
| 53 | 5 | 85 | U | 117 | u |
| 54 | 6 | 86 | V | 118 | v |
| 55 | 7 | 87 | W | 119 | w |
| 56 | 8 | 88 | X | 120 | x |
| 57 | 9 | 89 | Y | 121 | y |
| 58 | : | 90 | Z | 122 | z |
| 59 | ; | 91 | [ | 123 | { |
| 60 | < | 92 | \ | 124 |   |
| 61 | = | 93 | ] | 125 | } |
| 62 | > | 94 | ^ | 126 | ~ |
| 63 | ? | 95 | _ | 127 |   |
| 64 | @ | 96 | ` |     |   |

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)

## Appendix B

# Epson Printer Control Codes

Following are control codes for all Epson printers. Some of the functions are not available on all printers, and we've marked them with an asterisk. Refer to your printer's manual to see if it will perform the listed function, or just send the control code and see what happens. (We have not noted with asterisks some functions of which printers are capable, but which may not be available through Epson PICs or other interface devices for certain computers.)

From the BASIC programming language, the function is called with a command like LPRINT CHR\$(27)"P"; in other words, placing the command LPRINT before the command shown below. From some applications, the command below can be entered after a symbol that tells the printer a control code is coming.

A lower case "n", as in CHR\$(n), means a numeric value must be inserted.

| CHARACTER PITCH          | CONTROL CODE                         |
|--------------------------|--------------------------------------|
| Compressed               | On CHR\$(27) CHR\$(15) or CHR\$(15)  |
|                          | Off CHR\$(27) CHR\$(18) or CHR\$(18) |
| Expanded                 | On CHR\$(27) "W1"                    |
|                          | Off CHR\$(27) "WO"                   |
| Expanded (one line only) | On CHR\$(27) CHR\$(14) or CHR\$(14)  |
|                          | Off CHR\$(27) CHR\$(20) or CHR\$(20) |
| *Elite                   | On CHR\$(27)"M"                      |
|                          | Off CHR\$(27)"P"                     |
| *Proportional            | On CHR\$(27)"p1"                     |
|                          | Off CHR\$(27)"p0"                    |

### PRINT ENHANCEMENTS

|              |                     |
|--------------|---------------------|
| Emphasized   | On CHR\$(27)"E"     |
|              | Off CHR\$(27)"F"    |
| Doublestroke | On CHR\$(27)"G"     |
|              | Off CHR\$(27)"H"    |
| *Italics     | On CHR\$(27)"4"     |
|              | Off CHR\$(27)"5"    |
| Underline    | On CHR\$(27)" -1"   |
|              | Off CHR\$(27)" - 0" |
| *Superscript | On CHR\$(27)"S0"    |

|                |     |                       |
|----------------|-----|-----------------------|
|                | Off | CHR\$(27)"T"          |
| *Subscript     | On  | CHR\$(27)"S1"         |
|                | Off | CHR\$(27)"T"          |
| *NLQ           | On  | CHR\$(27)"x1"         |
|                | Off | CHR\$(27)"x0"         |
| *Master Select |     | CHR\$(27)"!" CHR\$(n) |
| International  | On  | CHR\$(27)"R" CHR\$(n) |
| characters     | Off | CHR\$(27)"R" CHR\$(0) |

## HORIZONTAL MOVEMENT

|                                   |     |                                     |
|-----------------------------------|-----|-------------------------------------|
| Set left margin                   |     | CHR\$(27)"1" CHR\$(n)               |
| Set right margin                  |     | CHR\$(27)"Q" CHR\$(n)               |
| Next tab                          |     | CHR\$(9)                            |
| *Set tabs                         |     | CHR\$(27)"D" CHR\$(n) CHR\$(n). . . |
| Carriage return                   |     | CHR\$(13)                           |
| Backspace                         |     | CHR\$(8)                            |
| Unidirectional                    | On  | CHR\$(27)"U1"                       |
|                                   | Off | CHR\$(27)"U0"                       |
| Unidirectional<br>(one line only) |     | CHR\$(27)"<"                        |

## VERTICAL MOVEMENT

|                       |     |                                      |
|-----------------------|-----|--------------------------------------|
| Line feed             |     | CHR\$(10)                            |
| Form Feed             |     | CHR\$(12)                            |
| Skip over perf        | On  | CHR\$(27)"N" CHR\$(n)                |
|                       | Off | CHR\$(27)"O"                         |
| Vertical tab          |     | CHR\$(11)                            |
| *Set vert. tab        |     |                                      |
| Channel 0 (all)       |     | CHR\$(27)"B" CHR\$(n) CHR\$(n). . .  |
| Channel nn            |     | CHR\$(27)"b" CHR\$(nn) CHR\$(n). . . |
| *Select vert. channel |     | CHR\$(27)"/" CHR\$(nn)               |
| Set page length       |     |                                      |
| Lines                 |     | CHR\$(27)"C" CHR\$(n)                |
| Inches                |     | CHR\$(27)"C0" CHR\$(n)               |

## GRAPHICS

|                |         |                                              |
|----------------|---------|----------------------------------------------|
| Single density | 60 dpi  | CHR\$(27)"K" CHR\$(n1) CHR\$(n2)             |
| Double density | 120 dpi | CHR\$(27)"L" CHR\$(n1) CHR\$(n2)             |
| *High speed    | 120 dpi | CHR\$(27)"Y" CHR\$(n1) CHR\$(n2)             |
| *Quadruple     | 240 dpi | CHR\$(27)"Z" CHR\$(n1) CHR\$(n2)             |
| 9-pin single   | 60 dpi  | CHR\$(27)"^" CHR\$(1) CHR\$(n1)<br>CHR\$(n2) |
| 9-pin double   | 120 dpi | CHR\$(27)"^" CHR\$(2) CHR\$(n1)<br>CHR\$(n2) |

$n2 * 256 + n1 = \text{number of columns reserved for graphics}$

Full 8-inch line, 1920 columns = CHR\$(128)CHR\$(7)

## USER DEFINED CHARACTERS

|                 |  |                                            |
|-----------------|--|--------------------------------------------|
| Copy ROM to RAM |  | CHR\$(27)":" CHR\$(0) CHR\$(0)<br>CHR\$(0) |
| Use RAM set     |  | CHR\$(27)%" CHR\$(1) CHR\$(0)              |

|                                           |                                  |
|-------------------------------------------|----------------------------------|
| Define characters                         | CHR\$(27)"&" CHR\$(n1) CHR\$(n2) |
| n1-n2 range of characters to be redefined |                                  |
| Expand redefine                           | On CHR\$(27)"6"                  |
| area                                      | Off CHR\$(27)"7"                 |

#### OTHER CODES

|                                |               |
|--------------------------------|---------------|
| Sound beeper                   | CHR\$(7)      |
| Select printer                 | CHR\$(17)     |
| Deselect printer               | CHR\$(19)     |
| Disable paper-out              | CHR\$(27)"8"  |
| Enable                         | CHR\$(27)"9"  |
| *Immediate print               | CHR\$(27)"i"  |
| *Half-speed mode               | CHR\$(27)"s"  |
| Cancel print buffer            | CHR\$(24)     |
| Cancel last char. in<br>buffer | CHR\$(127)    |
| *Cut-sheet feeder              | CHR\$(27)"EM" |
| *MSB =1                        | CHR\$(27)">"  |
| *MSB = 0                       | CHR\$(27)"="  |
| Cancel MSB Setting             | CHR\$(27)"#"  |

---

[Return to Table of Contents](#) | [Previous Chapter](#) | [Next Chapter](#)

## Appendix C

# Epson Printer Specifications

### MX-80 (Type III), MX-100

|                       |                                     |                    |   |
|-----------------------|-------------------------------------|--------------------|---|
| Print Speed:          | 80 cps                              |                    |   |
| Print Mechanism:      | 9 x 9 dot matrix                    |                    |   |
| Paper Feed:           | MX-80: tractor feed                 |                    |   |
|                       | MX-100, MX-80 F/T: friction/tractor |                    |   |
| Interface, Standard:  | Parallel                            |                    |   |
| Interface, Optional:  | RS-232-C, Current Loop, IEEE-488    |                    |   |
| Carriage Width, Pica: | MX-80: 80 char                      |                    |   |
|                       | MX-100: 136 char                    |                    |   |
| Dimensions:           | MX-80: 5.24"H x 15.7"W x 14.76"D    |                    |   |
|                       | MX-100: 5.23"H x 23.3"W x 15.47"D   |                    |   |
| Weight:               | MX-80: 15.4 lb. / MX-100 22 lb.     |                    |   |
| Pica:                 | X                                   | Master Select:     | 0 |
| Elite:                | 0                                   | SelecType:         | 0 |
| Compressed:           | X                                   | GRAPHICS_          |   |
| Expanded:             | X                                   | Single 60 dpi:     | X |
| Proportional:         | 0                                   | Double 120 dpi:    | X |
| Super/subscript:      | X                                   | High Speed Double: | 0 |
| Near letter quality:  | 0                                   | Quadruple 240 dpi: | 0 |
| Emphasized:           | X                                   | 9-pin single 60:   | 0 |
| Double-Strike:        | X                                   | 9-pin double 120:  | 0 |
| Italics:              | X                                   |                    |   |
| Underline:            | X                                   |                    |   |
| Life expectancy:      | Printer: MTBF 5 million lines       |                    |   |
|                       | Print head: 100 million characters  |                    |   |
|                       | (user replaceable)                  |                    |   |
|                       | Ribbon: 3 million characters        |                    |   |

### **RX-80, RX-100**

|                       |                                     |                    |   |
|-----------------------|-------------------------------------|--------------------|---|
| Print Speed:          | 100 cps                             |                    |   |
| Print Mechanism:      | 9 x 9 dot matrix                    |                    |   |
| Paper Feed:           | RX-80: tractor feed                 |                    |   |
|                       | RX-100, RX-80 F/T: friction/tractor |                    |   |
| Interface, Standard:  | Parallel                            |                    |   |
| Interface, Optional:  | RS-232-C, Current Loop, IEEE-488    |                    |   |
| Carriage Width, Pica: | RX-80: 80 char                      |                    |   |
|                       | RX-100: 136 char                    |                    |   |
| Dimensions:           | RX-80: 4.22"H x 14.84"W x 12.09"D   |                    |   |
|                       | RX-100: 5.2"H x 23.3"W x 15.5"D     |                    |   |
| Weight:               | RX-80: 15.4 lb./RX-100: 19.9 lb.    |                    |   |
| Pica:                 | X                                   | Master Select:     | 0 |
| Elite:                | X                                   | SelecType:         | 0 |
| Compressed:           | X                                   | GRAPHICS-          |   |
| Expanded:             | X                                   | Single 60 dpi:     | X |
| Proportional:         | 0                                   | Double 120 dpi:    | X |
| Super/subscript:      | X                                   | High Speed Double: | X |
| Near letter quality:  | 0                                   | Quadruple 240 dpi: | X |
| Emphasized:           | X                                   | 9-pin single 60:   | 0 |
| Double-Strike:        | X                                   | 9-pin double 120:  | 0 |
| Italics:              | X                                   |                    |   |
| Underline:            | X                                   |                    |   |
| Life expectancy:      | Printer: MTBF 5 million lines       |                    |   |
|                       | Print head: 100 million characters  |                    |   |
|                       | (user replaceable)                  |                    |   |
|                       | Ribbon: 3 million characters        |                    |   |
| Other:                | HX-20 Graphics set                  |                    |   |

### **FX-80, FX-100**

|                       |                                   |                |   |
|-----------------------|-----------------------------------|----------------|---|
| Print Speed:          | 160 cps draft mode                |                |   |
| Print Mechanism:      | 9 x 9 dot matrix                  |                |   |
| Paper Feed:           | Friction/tractor feed             |                |   |
|                       | Optional tractor for narrow stock |                |   |
| Interface, Standard:  | Parallel                          |                |   |
| Interface, Optional:  | RS-232-C, Current Loop, IEEE-488  |                |   |
| Carriage Width, Pica: | FX-80: 80 char                    |                |   |
|                       | FX-100: 136 char                  |                |   |
| Dimensions:           | FX-80: 3.94"H x 16.54"W x 13.66"D |                |   |
|                       | FX-100: 5.91"H x 24.2"W x 13.94"D |                |   |
| Weight:               | FX-80: 16.5 lb./FX-100: 23.1 lb   |                |   |
| Pica:                 | X                                 | Master Select: | X |

|                      |                                                                                                                           |                    |   |
|----------------------|---------------------------------------------------------------------------------------------------------------------------|--------------------|---|
| Elite:               | X                                                                                                                         | SelecType:         | 0 |
| Compressed:          | X                                                                                                                         | GRAPHICS-          |   |
| Expanded:            | X                                                                                                                         | Single 60 dpi:     | X |
| Proportional:        | X                                                                                                                         | Double 120 dpi:    | X |
| Super/subscript:     | X                                                                                                                         | High Speed Double: | X |
| Near letter quality: | 0                                                                                                                         | Quadruple 240 dpi: | X |
| Emphasized:          | X                                                                                                                         | 9-pin single 60:   | X |
| Double-Strike:       | X                                                                                                                         | 9-pin double 120:  | X |
| Italics:             | X                                                                                                                         |                    |   |
| Underline:           | X                                                                                                                         |                    |   |
| Life expectancy:     | Printer: MTBF 5 million lines<br>Print head: 100 million characters<br>(user replaceable)<br>Ribbon: 3 million characters |                    |   |
| Other:               | User defined characters<br>Hex dump mode<br>Forward & reverse feed (FX-80 only)                                           |                    |   |

### **FX-85, FX-185**

|                       |                                                                                                                           |                    |   |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------|--------------------|---|
| Print Speed:          | 160 cps draft mode<br>32 cps near letter quality                                                                          |                    |   |
| Print Mechanism:      | 9 x 9 dot matrix                                                                                                          |                    |   |
| Paper Feed:           | Friction/tractor feed<br>Optional tractor for narrow stock<br>Optional cut sheet feeder                                   |                    |   |
| Interface, Standard:  | Parallel                                                                                                                  |                    |   |
| Interface, Optional:  | RS-232-C, Current Loop, IEEE-488                                                                                          |                    |   |
| Carriage Width, Pica: | FX-85: 80 char<br>FX-185: 136 char                                                                                        |                    |   |
| Dimensions:           | FX-85: 3.94"H x 16.54"W x 13.66"D<br>FX-185: 5.91"H x 24.2"W x 13.94"D                                                    |                    |   |
| Weight:               | FX-85: 16.5 lb. /FX-185: 23.1 lb.                                                                                         |                    |   |
| Pica:                 | X                                                                                                                         | Master Select:     | X |
| Elite:                | X                                                                                                                         | SelecType:         | X |
| Compressed:           | X                                                                                                                         | GRAPHICS-          |   |
| Expanded:             | X                                                                                                                         | Single 60 dpi:     | X |
| Proportional:         | X                                                                                                                         | Double 120 dpi:    | X |
| Super/subscript:      | X                                                                                                                         | High Speed Double: | X |
| Near letter quality:  | X                                                                                                                         | Quadruple 240 dpi: | X |
| Emphasized:           | X                                                                                                                         | 9-pin single 60:   | X |
| Double-Strike:        | X                                                                                                                         | 9-pin double 120:  | X |
| Italics:              | X                                                                                                                         |                    |   |
| Underline             | X                                                                                                                         |                    |   |
| Life expectancy:      | Printer: MTBF 5 million lines<br>Print head: 100 million characters<br>(user replaceable)<br>Ribbon: 3 million characters |                    |   |

|        |                                                                                                                                   |
|--------|-----------------------------------------------------------------------------------------------------------------------------------|
| Other: | User defined characters<br>Hex dump mode<br>Forward & reverse feed (FX-85 only)<br>IBM Character set<br>8K to optional 32K buffer |
|--------|-----------------------------------------------------------------------------------------------------------------------------------|

### SPECTRUM LX-80

|                       |                                                                                                                           |                      |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------|
| Print Speed:          | 100 cps draft mode<br>16 cps near letter quality                                                                          |                      |
| Print Mechanism:      | 9 x 9 dot matrix                                                                                                          |                      |
| Paper Feed:           | Friction<br>Optional tractor for narrow stock<br>Optional cut sheet feeder                                                |                      |
| Interface, Standard:  | Parallel                                                                                                                  |                      |
| Interface, Optional:  | RS-232-C, IEEE-488                                                                                                        |                      |
| Carriage Width, Pica: | 80 char                                                                                                                   |                      |
| Pica:                 | X                                                                                                                         | Master Select: X     |
| Elite:                | X                                                                                                                         | SelecType: X         |
| Compressed:           | X                                                                                                                         | GRAPHICS-            |
| Expanded:             | X                                                                                                                         | Single 60 dpi: X     |
| Proportional:         | 0                                                                                                                         | Double 120 dpi: X    |
| Super/subscript:      | X                                                                                                                         | High Speed Double: X |
| Near letter quality:  | X                                                                                                                         | Quadruple 240 dpi: X |
| Emphasized:           | X                                                                                                                         | 9-pin single 60: X   |
| Double-Strike:        | X                                                                                                                         | 9-pin double 120: X  |
| Italics:              | X                                                                                                                         |                      |
| Underline:            | X                                                                                                                         |                      |
| Life expectancy:      | Printer: MTBF 5 million lines<br>Print head: 100 million characters<br>(user replaceable)<br>Ribbon: 3 million characters |                      |
| Other:                | User defined characters<br>Hex dump mode<br>1K to optional 32K buffer                                                     |                      |

### SPECTRUM LX-90/HOMEWRITER-10

|                      |                                                                                                              |
|----------------------|--------------------------------------------------------------------------------------------------------------|
| Print Speed:         | 100 cps draft mode<br>16 cps near letter quality                                                             |
| Print Mechanism:     | 9 x 9 dot matrix                                                                                             |
| Paper Feed:          | HW-10: Friction<br>LX-90: Friction/tractor<br>Optional tractor for narrow stock<br>Optional cut sheet feeder |
| Interface, Standard: | Needs optional PIC                                                                                           |
| Interface, Optional: | Intelligent Printer Interface<br>Cartridges for Apple II                                                     |

|                       |         |                                                                      |      |
|-----------------------|---------|----------------------------------------------------------------------|------|
|                       |         | family, Atari,<br>Commodore 64, IBM PC,<br>PCjr, Centronics parallel |      |
| Carriage Width, Pica: | 80 char |                                                                      |      |
| Pica:                 | X       | Master Select:                                                       | **** |
| Elite:                | **      | SelecType:                                                           | X    |
| Compressed:           | X       | GRAPHICS-                                                            |      |
| Expanded:             | X       | Single 60 dpi:                                                       | *    |
| Proportional:         | 0       | Double 120 dpi:                                                      | *    |
| Super/subscript:      | **      | High Speed Double:                                                   | *    |
| Near letter quality:  | X       | Quadruple 240 dpi:                                                   | *    |
| Emphasized:           | X       |                                                                      |      |
| Double-Strike:        | X       |                                                                      |      |
| Italics:              | ***     |                                                                      |      |
| Underline:            | **      |                                                                      |      |

Features available depend upon PIC being used.

\*Feature available on all except Atari.

\*\*Feature available on all except Atari and Commodore 64

\*\*\*Feature available only with Apple and Centronics.

\*\*\*\*Feature available only with Centronics.

|                  |                                                                                                                           |
|------------------|---------------------------------------------------------------------------------------------------------------------------|
| Life expectancy: | Printer: MTBF 5 million lines<br>Print head: 100 million characters<br>(user replaceable)<br>Ribbon: 3 million characters |
| Other:           | User defined characters<br>Hex dump mode<br>1K to optional 32K buffer                                                     |

### JX-80 COLOR PRINTER

|                       |                                                                                     |                      |
|-----------------------|-------------------------------------------------------------------------------------|----------------------|
| Print Speed:          | 160 cps draft mode                                                                  |                      |
| Print Mechanism:      | 9 x 9 dot matrix                                                                    |                      |
| Paper Feed:           | Friction/tractor<br>Optional tractor for narrow stock<br>Optional roll paper holder |                      |
| Interface, Standard:  | Parallel                                                                            |                      |
| Interface, Optional:  | RS-232-C, Current Loop, IEEE-488                                                    |                      |
| Carriage Width, Pica: | 80 char                                                                             |                      |
| Pica:                 | X                                                                                   | Master Select: X     |
| Elite:                | X                                                                                   | SelecType: X         |
| Compressed:           | X                                                                                   | GRAPHICS-            |
| Expanded:             | X                                                                                   | Single 60 dpi: X     |
| Proportional:         | X                                                                                   | Double 120 dpi: X    |
| Super/subscript:      | X                                                                                   | High Speed Double: X |
| Near letter quality:  | 0                                                                                   | Quadruple 240 dpi: X |
| Emphasized:           | X                                                                                   | 9-pin single 60: X   |
| Double-Strike:        | X                                                                                   | 9-pin double 120: X  |
| Italics:              | X                                                                                   |                      |
| Underline             | X                                                                                   |                      |

|                  |                                                                                                                                                                                                                            |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Life expectancy: | Printer: MTBF 5 million lines<br>Print head: 100 million characters<br>(user replaceable)<br>Ribbon: 140,000 characters (black)<br>130,000 characters (magenta)<br>130,000 characters (cyan)<br>80,000 characters (yellow) |
| Other:           | User defined characters<br>Hex dump mode<br>2K to optional 32K buffer<br>7 printer colors                                                                                                                                  |

### LQ-1500

|                       |                                                                                                             |
|-----------------------|-------------------------------------------------------------------------------------------------------------|
| Print Speed:          | 200 cps draft mode<br>67 cps letter quality                                                                 |
| Print Mechanism:      | 9 x 17 dot matrix, 24-pin printhead                                                                         |
| Paper Feed:           | Friction<br>Optional tractor for narrow stock<br>Optional cut sheet feeders (1 or 2 bin)                    |
| Interface, Standard:  | Must select one of options                                                                                  |
| Interface, Optional:  | Parallel, RS-232-C, IEEE-488                                                                                |
| Carriage Width, Pica: | 136 char                                                                                                    |
| Pica:                 | X Master Select: X                                                                                          |
| Elite:                | X SelecType: 0                                                                                              |
| Compressed:           | X GRAPHICS-                                                                                                 |
| Expanded:             | X Single 60 dpi: X                                                                                          |
| Proportional:         | X Double 120 dpi: X                                                                                         |
| Super/subscript:      | X High Speed Double: X                                                                                      |
| Letter quality:       | X Quadruple 240 dpi: X                                                                                      |
| Emphasized:           | X 9-pin single 60: X                                                                                        |
| Double-Strike:        | X 9-pin double 120: X                                                                                       |
| Italics:              | X                                                                                                           |
| Underline:            | X                                                                                                           |
| Life expectancy:      | Printer: MTBF 5 million lines<br>Print head: 100 million characters<br>Ribbon: 3 million characters (black) |
| Other:                | User defined characters<br>2K to optional 32K buffer (built into interfaces. No 32K in IEEE-488)            |

### LQ-800, LQ-1000

|                  |                                             |
|------------------|---------------------------------------------|
| Print Speed:     | 180 cps draft mode<br>60 cps letter quality |
| Print Mechanism: | 9 x 17 dot matrix, 24-pin printhead         |

|                       |                                         |                |   |
|-----------------------|-----------------------------------------|----------------|---|
| Paper Feed:           | Friction                                |                |   |
|                       | Optional tractor for narrow stock       |                |   |
|                       | Optional cut sheet feeders (1 or 2 bin) |                |   |
| Interface, Standard:  | Parallel and RS-232-C serial            |                |   |
| Carriage Width, Pica: | LQ-800: 80 char                         |                |   |
|                       | LQ-1000: 136 char                       |                |   |
| Pica:                 | X                                       | Italics:       | X |
| Elite:                | X                                       | Underline:     | X |
| Compressed:           | X                                       | Master Select: | X |
| Expanded:             | X                                       | SelecType:     | 0 |
| Proportional:         | X                                       | GRAPHICS-      |   |
| Super/subscript:      | X                                       | Up to 360 dpi: | X |
| Letter quality:       | X                                       |                |   |
| Emphasized:           | X                                       |                |   |
| Double-Strike:        | X                                       |                |   |
| Other:                | Plug-in font cartridges                 |                |   |
|                       | 7K buffer                               |                |   |

### SQ-2000

|                       |                                         |                    |   |
|-----------------------|-----------------------------------------|--------------------|---|
| Print Speed:          | 176 cps draft mode                      |                    |   |
|                       | 106 cps letter quality                  |                    |   |
| Print Mechanism:      | 9 x 17 dot matrix, 24-nozzle ink jet    |                    |   |
| Paper Feed:           | Friction                                |                    |   |
|                       | Optional tractor for narrow stock       |                    |   |
|                       | Optional cut sheet feeders (1 or 2 bin) |                    |   |
| Interface, Standard:  | Must select optional interface          |                    |   |
| Interface, Optional:  | RS-232-C, IEEE-488, parallel            |                    |   |
| Carriage Width, Pica: | 136 char                                |                    |   |
| Pica:                 | X                                       | Master Select:     | X |
| Elite:                | X                                       | SelecType:         | 0 |
| Compressed:           | X                                       | GRAPHICS-          |   |
| Expanded:             | X                                       | Single 60 dpi:     | X |
| Proportional:         | X                                       | Double 120 dpi:    | X |
| Super/subscript:      | X                                       | High Speed Double: | X |
| Letter quality:       | X                                       | Quadruple 240 dpi: | X |
| Emphasized:           | X                                       | 9-pin single 60:   | X |
| Double-Strtike:       | X                                       | 9-pin double 120:  | X |
| Italics:              | X                                       |                    |   |
| Underline:            | X                                       |                    |   |
| Other:                | User defined characters                 |                    |   |
|                       | Optional 32K to 128K buffer             |                    |   |
|                       | Multi-font typeface board               |                    |   |

### HS-80 Letterjet

|              |                            |
|--------------|----------------------------|
| Print Speed: | 160 cps draft mode         |
|              | 32 cps near letter quality |

|                       |                                                                                                                                                   |                    |   |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---|
| Print Mechanism:      | 9 x 9 dot matrix, 9-nozzle ink jet                                                                                                                |                    |   |
| Paper Feed:           | Friction<br>Optional cut sheet feeder                                                                                                             |                    |   |
| Interface, Standard:  | Parallel                                                                                                                                          |                    |   |
| Carriage Width, Pica: | 80 char                                                                                                                                           |                    |   |
| Pica:                 | X                                                                                                                                                 | Master Select:     | X |
| Elite:                | X                                                                                                                                                 | SelecType:         | 0 |
| Compressed:           | X                                                                                                                                                 | GRAPHICS-          |   |
| Expanded:             | X                                                                                                                                                 | Single 60 dpi:     | X |
| Proportional:         | 0                                                                                                                                                 | Double 120 dpi:    | X |
| Super/subscript:      | X                                                                                                                                                 | High Speed Double: | X |
| Near letter quality:  | X                                                                                                                                                 | Quadruple 240 dpi: | X |
| Emphasized:           | X                                                                                                                                                 | 9-pin single 60:   | X |
| Double-Strike:        | X                                                                                                                                                 | 9-pin double 120:  | X |
| Italics:              | X                                                                                                                                                 |                    |   |
| Underline:            | X                                                                                                                                                 |                    |   |
| Life expectancy:      | Printer: MTBF 5 million lines<br>Ink reservoir: 75 pages before refill<br>Battery: 300 charges<br>Print head: 200 million dots<br>(100,000 pages) |                    |   |
| Other:                | 1K buffer<br>Nicad battery<br>AC adaptor/charger                                                                                                  |                    |   |

#### **P-80, P-80X Thermal Printer**

|                       |                                                                                      |                        |   |
|-----------------------|--------------------------------------------------------------------------------------|------------------------|---|
| Print Speed:          | 45 cps draft mode<br>22.5 cps near letter quality (P-80X only)                       |                        |   |
| Print Mechanism:      | 9 x 9 dot matrix, 9-pin head (PX-80) or 7 x 8 draft, 16 x 24 LQ, 24-pin head (P-80X) |                        |   |
| Paper Feed:           | Friction                                                                             |                        |   |
| Interface, Standard:  | RS-232-C                                                                             |                        |   |
| Carriage Width, Pica: | 80 char                                                                              |                        |   |
| Pica:                 | X                                                                                    | Master Select:         |   |
| Elite                 | 0                                                                                    | (P-80X only)           | X |
| Compressed:           | X                                                                                    | SelecType:             | 0 |
| Expanded:             | X                                                                                    | GRAPHICS-              |   |
| Proportional:         | 0                                                                                    | 24-pin Single 60 dpi:  |   |
| Super/subscript       | X                                                                                    | (P-80X only)           | X |
| Near letter quality:  |                                                                                      | 24-pin Double 120 dpi: |   |
| (P-80X only)          | X                                                                                    | (P-80X only)           | X |
| Emphasized:           | X                                                                                    | High Speed Double:     | 0 |
| Double-Strike:        | X                                                                                    | Triple 180 dpi:        |   |
| Italics:              | X                                                                                    | (P-80X only)           | X |
| Underline:            | X                                                                                    | Quadruple 240 dpi      | 0 |
|                       |                                                                                      | 9-pin single 60:       | X |
|                       |                                                                                      | 9-pin double 120:      | X |

|                  |                                                                                          |
|------------------|------------------------------------------------------------------------------------------|
| Life expectancy: | Printer: MTBF 500,000 lines<br>Print head: 20 million characters<br>Battery: 300 charges |
| Other:           | 250 byte buffer<br>Nicad battery/AC adapter-charger                                      |

### AP-80

|                       |                                                  |                         |   |
|-----------------------|--------------------------------------------------|-------------------------|---|
| Print Speed:          | 75 cps draft mode<br>15 cps near letter quality  |                         |   |
| Print Mechanism:      | 9 x 17 dot matrix, 9-pin printhead               |                         |   |
| Paper Feed:           | Friction<br>Detachable tractor for narrow stock  |                         |   |
| Interface, Standard:  | Apple plug compatible                            |                         |   |
| Carriage Width, Pica: | 80 char                                          |                         |   |
| Pica:                 | X                                                | Master Select:          | X |
| Elite:                | 0                                                | SelecType:              | 0 |
| Compressed:           | X                                                | GRAPHICS-               |   |
| Expanded:             | X                                                | Single-density 60 dpi:  | X |
| Proportional:         | X                                                | Double density 120 dpi: | X |
| Super/subscript:      | X                                                | High speed double       | X |
| Near letter quality:  | X                                                | Quadruple density 240   | X |
| Emphasized:           | X                                                |                         |   |
| Double-Strike:        | X                                                |                         |   |
| Italics:              | X                                                |                         |   |
| Underline:            | X                                                |                         |   |
| Other:                | Auto sheet feed advances paper to print position |                         |   |

### DX-10, DX-20, DX-35 Daisywheel Printers

|                       |                                                                                                                         |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------|
| Print Speed:          | DX-10: 10 cps<br>DX-20: 20 cps<br>DX-35: 35 cps                                                                         |
| Print Mechanism:      | Formed character, daisywheel                                                                                            |
| Paper Feed:           | Friction Optional: tractor, cut sheet feeder                                                                            |
| Interface, Standard:  | DX-10: Parallel<br>DX-20, DX-35: Diablo-compatible<br>universal interface can be set for parallel, RS-232-C or IEEE-488 |
| Carriage Width, Pica: | DX-10: 82 char<br>DX-20: 110 char<br>DX-35: 136 char                                                                    |
| Typefaces:            | All Diablo & compatible printwheels<br>10, 12, 15, & proportional pitch                                                 |
| Life expectancy:      | Printer: MTBF 500,000 lines<br>Print head: 20 million characters<br>Battery: 300 charges                                |
| Other:                | Optional typewriter keyboard (DX-20/35)                                                                                 |

## HI-80 Color Plotter

|                      |                                                                                                       |
|----------------------|-------------------------------------------------------------------------------------------------------|
| Print Speed:         | 9 ips plotter mode<br>15 moves per second maximum<br>6.5 cps printer mode                             |
| Print Mechanism:     | Paper movement, 4 pens                                                                                |
| Pen types:           | Ball point (water-based ink)<br>Fiber tip (water-based ink)<br>Fiber tip (oil-based ink)              |
| Paper Feed:          | Friction                                                                                              |
| Interface, Standard: | Parallel                                                                                              |
| Interface, Optional: | RS-232-C, IEEE-488 GPIB                                                                               |
| Carriage Width:      | 8½                                                                                                    |
| Printer mode:        | All RX-80 print features                                                                              |
| Plotter mode:        |                                                                                                       |
| Colors, standard:    | Red, Green, Blue, Black                                                                               |
| Colors, optional:    | Cyan, Magenta, Yellow, Brown,<br>Orange, Purple                                                       |
| Commands:            | 17 drawing, 42 plotting functions                                                                     |
| Minimum step size:   | .004" (0.1 mm)                                                                                        |
| Repetition accuracy: | .012" (0.3 mm) single pen<br>.020" (0.5 mm) different pens                                            |
| Other:               | Optional HP-GL emulation ROM<br>Optional printer expansion ROM<br>Optional User-defined character RAM |

---

[Return to Table of Contents](#) | [Previous Chapter](#)