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# **IBM® Personal Computer Directory**

BRIAN W. KELLY AND DENNIS J. GRIMES

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A WILEY PRESS BOOK  
**John Wiley & Sons, Inc.**

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New York • Chichester • Brisbane • Toronto • Singapore

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Printed in the United States of America

85 86 10 9 8 7 6 5 4 3 2 1

#### **Library of Congress Cataloging in Publication Data**

Kelly, Brian W.

IBM personal computer directory.

"A Wiley Press book."

Includes index.

1. IBM Personal Computer—

Directories. 2. Computer programs—

Directories. I. Grimes, Dennis J.

II. Title. III. Title: I.B.M. personal computer directory.

QA76.8.I2594K46 1984 001.64

84-17394

ISBN 0-471-87821-9

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**Kelly/Grimes**

**IBM® Personal Computer Directory**

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Apple® Computer Directory

DEC® Microcomputer Directory

Directory of Word Processing Systems

IBM® PC Compatible Computer Directory

IBM® Personal Computer Directory

## Dedication

*This first edition of our Kelly/Grimes IBM® Personal Computer Directory is dedicated to our wives—Barbara Grimes, Patricia Kelly; our children—Mary, Patricia, Elizabeth, and Denise Grimes, Brian Patrick and Michael Patrick Kelly; and our parents—Viola and Dennis Grimes, Sr., Gertrude and Aloysius Ankenbrand, and Angel Irene M. Kelly and Edward J. Kelly, Arline and Stanley Piotroski. Their unfailing encouragement and support enabled us to see this project through to its successful completion.*

## Acknowledgments

We have come to believe here at the Kelly/Grimes Corporation that the only thing we can do alone is fail. And, therefore, we do nothing alone. First of all we've got an excellent in-house staff of writers, editors, and text entry personnel. Even Frank, our maintenance man (in our two rented rooms) keeps things so shipshape that we can't help but do a good job. Then there are the folks at Kay Marketing, our data servicer, who have helped us in more ways than just data processing—and without whom this work would never have materialized. We're going to mention all the names—both inside Kelly/Grimes Corporation and outside—of the people who selflessly contributed to bringing this work into the hands of the general public.

Although pride forces us to accept some credit for its success (after all, we picked the people), the real heroes in this venture are the more than 30 individuals who gave our "machine" the horsepower to win the race.

Al Teufel and Paul O'Hop offered us the business expertise we needed to start our project moving. Ann Flannery, our business and communications manager, gave us the consistency, stability, and spiritual strength we needed when all was not okay—while with her other hand she ran the *business* part of our business. Mary Daniels, Mary Ankenbrand, Irene Flannery, Mary "B" Benjamin, Judy Gulick, Vicki Welza, Marie Hogan, Ida Marino, Patti Michaels, Barbara Prushinski, and Nance Koreko worked long and hard to enter all of our product specification data into our data base.

Of course, there would have been no data to enter if it weren't for the melodious voice of our Rose Seroka, who continually convinced companies that it was worth their while to complete our questionnaires. We'd be lying if we said that all of the data came in clean and ready to enter. That's where the best technical editor in the world, Kathy Englehart, placed her efforts. She checked specification data for accuracy; added salient points that were missing; checked grammar; and wrote original material when necessary.

Mary Jo Mezanko is another one of our super-heroines. She typed every one of our editorial pieces into the data base. Everything

Mary Jo typed then went to Myrna Schaefer or Ann Grimes for copyediting. We first dreaded having to send material to Myrna, knowing that it would be returned with all sorts of notations from commas missing, to dangling participles and misplaced modifiers. (We were hung up on misplaced modifiers for quite a while, so it seems.) Myrna and Ann are English teachers by trade, and, hopefully, we were good pupils, because they got to see a lot of us. (Ann doesn't know it, but one day Myrna edited a piece that Ann had already completed. Even English teachers can't agree on grammar; it was red on blue on black. Mary Jo had fun making the changes to that one!)

Viola Grimes, Dennis Grimes, Sr., Ed Kelly, Sr., Ed Kelly, Jr., Carol Kelly, Tom Grimes, Joe Kelly, Dianne Kelly, Jim Flannery, Bill Daniels, Gerry Rodski, Smokey and Arline Piotroski, Al and Gert Ankenbrand, Mary Flannery, Jennifer Benjamin, Margaret Benjamin and Sal Buono—all were there when we needed them. Their tasks ranged from watching the kids, reviewing material, helping with the mailings, supplying cable for terminals, to making the post office run—all vitally important when you're forced to live with just one set of arms and legs each.

Steve Kotch, Bob Sickler, and Nancy Lavan provided valuable artistic and promotional services. The Lynn Organization, an advertising firm in Wilkes-Barre, helped us understand the complexities of advertising and sales techniques. Ken Bailey from Kay Wholesale, Charlie Snyder, and Matt Fields all contributed their expertise to keep our advertising efforts both frugal and fruitful. (We're contemplating allowing a limited number of full-page color ads in our next edition. Please drop us a line to let us know what you think!)

Our special thanks to Howard Greenberg, President of Kay Marketing Services in Wilkes-Barre, for allowing us to use his computer system to store our product data base. Howard gave us two terminals, connected to his system, to use on our own premises. Also, since our office is directly across from the Kay Building, we received a lot of help from people at all levels of the Kay organization.

Al Komorek, Data Processing Director at Kay, provided us with the talent we needed to solve many of the technical problems we encountered in this implementation. Al also gave the nod whenever we asked him for additional processing time, without which we'd now be preparing a business autopsy report instead of a note of thanks. You're a true friend, Al, even though we were severe "pains" at times. Thank you.

One of those talents which Al provided was Brian Nichols, a bright twenty-six-year-old programmer at Kay. Brian often got the call that "the tube is stuck" and always fixed the problem. Al Wielgosz and Patti Davis made sure that our jobs were run and that our reports were always out on time—even if it meant that they had to work a little longer, or on a Saturday. Jim Sheehan, the general manager at Kay, made sure that all Kelly/Grimes requests were resolved quickly.

In a phenomenally short period of time, Trudy Clemson wrote, tested, and debugged our online and batch programs and made sure everything worked. There aren't too many people in the business as good, as hard-working, and as dedicated as Trudy Clemson. When necessary, she worked until all hours of the morning making sure that entry programs were operational for our data entry staff, and that text tapes were available for John Wiley & Sons on the day they were due. As you can tell, we think Trudy is super, and she's only twenty-five years old.

Our special thanks again to Trudy, Howard, and all the Kay personnel, for without their help and the help of others, both mentioned and unmentioned, we would still be wondering if producing five books in a very limited amount of time was a realistic goal. We did it! Thank you all!



*Kelly/Grimes Staff*



*Staff of Kay Wholesale (Computer Services)*



# To the Reader

Without having to spend hundreds of dollars to subscribe to technical literature offered by computer research firms, or having to purchase a host of magazines to learn about IBM personal computers, or having to feel shortchanged or intimidated by under-informed salespeople, today's personal computer shopper can find all the answers right here in the *Kelly/Grimes IBM® Personal Computer Directory*.

This book has been designed to be a first source computer product and service reference for both the neophyte and the experienced computer user. Brief articles at the beginning of this volume help readers understand the rapidly expanding world of personal computers, software, and their related products.

The heart of this directory is the Product Reference Guide, which provides detailed product specifications of IBM personal computer hardware, software, systems, and accessories. It is presented in a consistent format for product comparison and includes manufacturers' comments to highlight unusual or unique features. There is also a series of indexes to help the reader use this publication as a complete reference tool.

Veteran computer and word processing users, as well as professional data processing personnel, can use this book to learn more about personal computers. They can also turn to the Guide to help them choose the best furniture, paper products, magnetic media, software, peripherals, components—even their own IBM personal computer.

Business people can use the directory

to help them select a small system for use in their firm or at home. The software section of the Product Reference Guide can aid them in finding the best application fit for their business needs. Information on word processing, billing, accounts receivable, general ledger, and spreadsheets are among the many offerings in this section. Readers can then select and configure the system they need by comparing the hardware specifications for those systems that run the particular software they're interested in.

Computer hobbyists, ham radio operators, and game and program developers, among others, will be attracted to the Product Reference Guide as their best reference and comparison vehicle. They will be able to compare specifications of one manufacturer with those of another and, in so doing, will discover the great number of products that they might not have known existed.

In addition to being our personal challenge, the *IBM® Personal Computer Directory* and other books in our *Kelly/Grimes Directories* series have been produced in answer to the demand of prospective customers for a comprehensive, "one-stop" guide to the selection and purchase of hardware, software, and peripherals. We're sure you'll enjoy reading it, and we're even more sure you'll find it invaluable when you go to make your first (or next) personal computer purchase.

Dennis J. Grimes  
Brian W. Kelly

## **Kelly-Grimes Editorial Staff**

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*Dennis J. Grimes and Brian W. Kelly*

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# A Look at Microcomputer Software

The term *software* describes a program or group of programs used with a computer; it is the complex series of instructions that tells a computer what to do. This article will discuss microcomputer software as opposed to software used by larger main frames or minicomputers. But for simplicity's sake, computer will be used instead of the longer term microcomputer.

## SOME HARD FACTS ABOUT SOFTWARE

Computer software fits into two broad categories: systems software and applications software. A computer uses both types. Most people use applications software, while their technically adept friends may get involved in systems software. With systems software, you can write your own applications software.

Systems software includes languages such as BASIC, Pascal, Logo, and FORTRAN. When you buy a computer, this type of software is often already in place and ready to go. Other times you have to load it yourself. Systems software also includes what is referred to as the computer's *operating system*, the specific kind of internal "manager" used to coordinate and control the operations of the various hardware and applications software components. There are various operating systems available.

Applications software is what you most often see for sale at your local retail store. You use applications software in your computer to perform such tasks as word processing, generating electronic spreadsheets, checking spelling errors, and destroying alien invaders in certain games. Pac-Man is an applications software program. Applications software is sold by both manufacturers and software companies.

## The Floppy Disk

Most applications software programs use a thin flexible disk as the storage medium for their program instructions. These disks are called floppy disks or, simply, floppies. They are enclosed in stiff cardboard jackets for protection from dust, fingerprints, and other dirt. Thus, when you purchase a software program, you're buying an object that resembles a 45-r.p.m. record (as well as the documentation that explains how to use it).

Floppy disks come in two common sizes—8 inches and 5¼ inches in diameter. The smaller size has considerably less storage space, but it is also less expensive. As technology advances in years to come, smaller sizes will be available and will be able to carry as much as or even more information than the current sizes.



Photo courtesy of Reliance Plastics & Packaging Div.

Floppies are said to be either single- or double-sided and single- or double-density. A double-sided floppy disk holds information on both sides, just as a 45-r.p.m. record has a song on both sides. Double-density disks pack more information into the available space than do

their single-density alternatives. Disk technology is evolving rapidly, and industry-wide standardization is still some years away.

## SOFTWARE APPLICATIONS

Your initial choice of software depends on the specific task you want the program to do—word processing, data-base management, graphics, or games. Once the field has been narrowed to this extent, you're ready to search for the best specific program.

We will now look at three of the more common business software applications.

### Word Processing Applications

If your business requires extensive paperwork, from memos and letters to complex reports, then a word processing program will increase productivity by shortening the time needed to prepare these documents.

Word processing programs vary in price depending on their power, complexity, and range of features they offer. When deciding between simple and more complex programs, consider whether your needs are writing brief letters or multi-page reports that include footnotes, indexes, formulae, and so forth.

Less powerful word processors offer simple editing functions that permit you to add and delete text and, perhaps, use certain special printing effects such as underline or boldface. More powerful programs do all that and much more. They can enable you to move blocks of text, search for specific words in your document, merge different programs, incorporate a spelling checker, and take advantage of many more kinds of print enhancements.

The more powerful word processors cost more and take more time to learn.

But their power and flexibility can meet the most demanding word processing needs.

### Financial Planning Applications

If you are in business, financial planning software can help you to answer many of the "What if . . . ?" questions you might usually entrust to accountants or others.

When there are a large number of alternatives available in a business consideration, financial planning software lets you experiment with your options.

For instance, if you were estimating business expenses for the next six months, this software would let you juggle such variables as interest rates, inflation percentages, the price of oil, salary increases, and so forth. If you changed the value or percentage of any one of the variables, the software would adjust the other criteria accordingly.

### Data-Base Management Applications

If there's one trait shared by inhabitants of the civilized world, it's that everyone compiles lists of some sort. And, of course, any list can be broken down into a plethora of sub-lists.

The information a business compiles on its customers may be used to create lists of customers who do and don't owe money, those who live in Ohio, those whose last order was in excess of \$1,000, and so forth. This customer data may be managed in many different ways. You can also use data storage and retrieval programs to create forms and generate reports that will help you make more intelligent business decisions.

Once such information is on disk and out of the file cabinet, it is much simpler to expand and update customer information. Data-base management software programs are often used with software that's capable of sorting information.

If you wanted to test a special product offer with a group selected by geography and purchasing history, a sorting program could access your data files and pull out, for example, all New England customers who did more than \$20,000, but less than \$50,000, worth of business with you last year. You could then arrange that list alphabetically within each New England ZIP code. And, with a file merging program, send out a personalized mailing list to the customers of your choice.

### MAKING THE FINAL SELECTION

Once you know what kind of software program you need, there are a number of things you can do to help ensure you select the specific program that's best for you: get hands-on experience at a software store; read some software documentation to see if it's written in language you can understand; ask dealers

**Once you know what kind of software program you need, there are a number of things you can do to help ensure you select the specific program that's best for you.**

about the reputation of the company licensing the software; inquire about product updates; and see if the program you're investigating has been reviewed in one of the computer magazines.

### Documentation

A software firm's support document is important to all users and should be accessible to everyone. If you're not a programmer yourself, it doesn't do you much good to have a user's manual geared to that audience. Most people are still new to computers; therefore, software documentation must address basic needs in language that is simple and straightforward, and not awash in computer buzzwords.

Some documentation on the market is truly professional. It's well-indexed, well-organized, and includes built-in exercises, usually called *tutorials*, to help users learn. Support documentation is beginning to be written by communications experts, not programmers, and this means the overall quality can be expected to improve. Always try to read through the documentation before buying a program to make sure you can understand it and learn from it.

### On-Screen Assistance

One of the most popular industry buzzwords is "user-friendly," which has become a claim that many software firms make about their programs. Ideally, a software program will let you learn how

to use it without total dependence on the user's manual.

Many programs are referred to as *menu driven*, i.e., they provide on-screen explanations of what keys must be pressed in order to execute a certain command. Learning how to use a computer has everything to do with memorizing the proper keystrokes, and if a glance at the screen shows you the proper com-

mand sequence, it really makes things easier.

Furthermore, most programs allow you to control how much on-screen assistance you desire. Since menus take up space on the video display terminal, less of what you're working on can be seen. Being able to suppress the menu as you become more proficient with the program is definitely a plus.

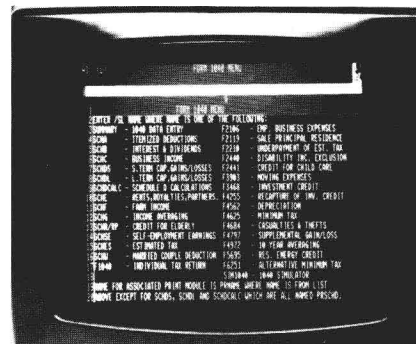


Photo courtesy of Design Trends, Ltd.

Some software firms supply keytop stickers. These are placed right on top of the conventional keyboard keys and tell you what particular software command is also associated with that particular key.

### Other Considerations

Because the microcomputer industry is a rapidly changing one, it's important to consider the reputation of the firm whose software you're considering.

How does one gauge a software firm's respectability? Computer retailers are probably the best source; they deal with



the companies in question, and their experiences will provide a reliable yardstick. Microcomputer industry magazines and newspapers are also excellent sources. Retailers, by the way, can also direct you to software user groups that may be meeting in your area and using a particular company's software that you may wish to purchase.

Computer retailers can help you to select the best applications software for your specific needs, and bookstores and libraries will also provide material to assist you. But remember, *you* are in the best position to determine your needs.

Don't neglect your own thoughts and feelings when deciding which program or programs are best for you.

### **CLOSING THOUGHTS**

As you can imagine, this article has barely scratched the surface of what there is to know about microcomputer software, computers, and the industry itself.

Future historians will place those of us living in the 1980s and 1990s in the vanguard of the information revolution. Even as we speak, the computer is making an impact in our schools, our busi-

nesses, and our living rooms. Its presence is intolerable to some, applauded by many, and ignored by others. No matter. Its advance is inexorable, welcomed or not.

You are encouraged to participate in the computer revolution. The resources you can tap to learn about it are available at little or no cost through community colleges, libraries, and bookstores. You may find any awe or aversion you have replaced by curiosity, if not fascination. Software and computers aren't foes to fear; they're tools to use. Make the most of them.

*Susan Piotroski*

# **What Can a Personal Computer Do for You?**

To get the most out of a personal computer, you need to learn just what it can do for you and how to take advantage of its capabilities.

One of the easiest ways to make quick use of a personal computer is by letting someone else program it for you. Fortunately, prepackaged computer software allows you this luxury. This article will introduce many of the most popular types of software packages that have been developed for the personal computer and discuss some of the different uses of the machine.

## **PERSONAL COMPUTERS FOR BUSINESS**

Before the advent of the personal computer, the costs of computerizing basic accounting functions were prohibitively expensive for many small business owners. With the use of software developed specifically for the personal computer, it is now possible to establish an automated system for double-entry bookkeeping, billing, accounts receivable, and much more.

### ***Billing and Accounts Receivable***

With existing software, you can now print invoices and produce ready-to-mail statements for customers in a variety of forms. For example, you could show: the balance due only; the balance due, plus a list of itemized charges; or, the balance, an itemization, and the inclusion of some message to be given to some or all customers.

As you receive customers' payments, you can build a computerized file of the transactions and have the computer periodically sort and merge the information with the master file of customer accounts to give you assessments of all customers' balances and receipts. Typically, these software packages can accommodate all of the required paperwork, including detailed sales analysis.

### ***Inventory Control***

There are also software packages available for tracking inventory and associated information, such as dollar value and frequency of usage for each item. As with the basic accounting systems, this

kind of software can process information on stock received and dispensed and provide accurate accounting of inventory at any time. You can also use the software to analyze such questions as the variable costs of carrying, versus ordering, different items of inventory.

### ***Word Processing***

While many of the functions performed by personal computers focus on the manipulations of numerical information, these computers can also process textual data using word processing. In business, for example, word processing can be invaluable in the preparation of correspondence, reports, and almost any other written document. But word processing is hardly the private domain of business. Anybody who can write can sit down at a

*Susan Piotroski received her Ph.D. in quantitative psychology and applied statistics from the University of Pittsburgh. She currently serves as supervisor of a statistical group in the Rate Research and Forecasting Department of the Boston Edison Company. She also does outside statistical consulting.*

word processor and have fun—and get some writing accomplished.

The process is quite simple. Once you type material into the computer, word processing gives you great power and flexibility in manipulating the text: typographical errors and misspellings can be easily identified and corrected; material can be moved, inserted, or deleted; and all occurrences of a specific word or phrase entered in the text can be replaced with a different word or phrase. Suppose, for example, that you have written a lengthy report proposing a project repeatedly referred to as the XYZ project, and at the last minute its name is changed to the ZYX project. The replacement feature in word processing enables you to make the change throughout the report in a matter of seconds, regardless of how many times the name occurs. Finally, after all the editing of the text is complete, with the proper attachments, your computer can print out a hard copy to your specifications.

Another popular use of word processing is to individualize standard form letters. You can change just the name and address part of the document file for each customer and leave the body of the letter unchanged. This will give each of your customers (or whoever the targeted groups are) a personalized, individually typed letter that is more likely to elicit a favorable response than would a photocopied form letter.

### **Spreadsheet Generators**

Current software provides two very useful methods for analyzing financial

data and making business decisions. One of these methods is the use of *spreadsheet generators*. VisiCalc®, SuperCalc®, and MultiPlan™ are three of the most popular software packages of this type. They enable numerical values, textual information, and formulae for manipulating numerical quantities to be entered into the computer and used in various ways to

activities must follow, precede, or occur along with other activities. Once individual activities are organized in this way, you can estimate the most likely time to completion of the entire project and identify which particular activities require an intensified effort (e.g., authorizing overtime) in order to shorten the time to completion.

## ***The usefulness of the personal computer is not confined to small businesses alone.***

analyze business data and help in making complex decisions. Spreadsheet generators are especially useful if a change is necessary in one of the original figures input into the calculations.

You can also use spreadsheet software to present results in an organized format suitable for professional-looking exhibits in reports or slide presentations.

### **PERT/CPM**

Another useful software aid to decision-making is the so-called critical path analysis, or Program Evaluation and Review Technique (PERT). With this technique, the computer can organize a list of the sequence of events and activities that must occur from the beginning to end of any given project. Along with a description of each individual activity in the project is an estimate of the earliest and latest possible completion time for each activity and an indication of which ac-

### **Personal Computers in Large Businesses**

The usefulness of the personal computer is not confined to small businesses alone. Even in larger businesses with medium to large computer facilities, the personal computer is a valuable resource. It can help reduce the “down time” of a larger computer by storing some of the more frequently used data itself.

The personal computer can also act as an intelligent terminal when it is hooked up to a large computer. It can thus be used to transfer information back and forth from the large computer, and even interact with the computing capabilities of the larger machine.

### **PERSONAL COMPUTERS FOR HOME USE**

#### **Finance**

You can use a personal computer to record all household financial transactions in whatever format is most helpful to you. Different kinds of software enable you to display information by expense category, date, or other useful dimensions. You can also track household expenses to see if one area (food or clothing, for example) is commanding a disproportionate amount of the family income. If so, you can then focus on trying to control those costs.

In addition, software is available for setting future budget goals, and printouts can show weekly or monthly progress toward those goals. You can also compute monthly mortgage payments under various down payment/interest rate scenarios, track the performance of personal stock investments, enumerate a list of all household possessions for insurance pur-



Photo courtesy of Lexisoft, Inc.

poses, and, over the course of the year, accumulate a total of all deductible expenses for filing year-end tax returns.

### **Education**

One of the most valuable uses of the personal computer is for home education. Programmed learning packages provide instruction in foreign languages, social sciences, mathematics, statistics, biology, chemistry, and a number of other topics. Many of these software packages are designed to be lively and entertaining, as well as instructional. One of the principal advantages of computer instruction is the interactive nature of the learning. The ability of the computer to respond to answers immediately and to elicit responses makes the entire learning experience much more active and captivating than our traditional "book learning" methods.

### **Entertainment**

As long as we are on the subject of entertaining instruction, it's appropriate to mention a few fun-and-games programs for the personal computer. Among them are the very popular dot-gobbling Pac-Man, a simulated basketball game, and even a program to help improve the odds at blackjack. In fact, there are thousands of such programs available, and it's a sure bet you can find entertainment software for any personal computer.

### **Other Uses in the Home**

Word processing can be extremely useful in the home. For example, it can be used to store and print mailing lists for birthday or various holiday cards, or for important family events and activities. Yet another way to use the personal computer is as an information source. It can help

you gain access to information from updated major newswires and provide data on the very latest stock market figures. Every day, new software appears on the market offering innovative applications for the home that will make your personal computer even more indispensable.

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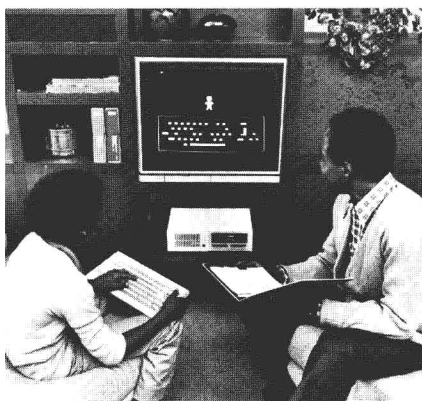


Photo courtesy of IBM Corporation

### **SUMMING IT UP**

As we have learned, the personal computer can be used for a variety of purposes. In businesses and homes alike, it is an effective tool for performing accounting, financial, and word processing functions, for facilitating the decision-making process, for enhancing education, and for just plain fun. The field of developing software for the personal computer is burgeoning. In future years, we can expect to see countless new ways to use the personal computer in improving business and bettering the quality of life in our homes.



Photo courtesy of IBM Corporation

# Training for Personal Computers

Computers are easy to learn and use. The ads say so. It must be true. Just look at the kids; *they're* not intimidated. You can see children playing with Logo (a computer programming language for kids) at the age of six, "computer literate" at twelve, writing and selling computer programs at sixteen, millionaires at twenty-two.

For someone over thirty, it's all a little frightening.

It's also mostly untrue. Nobody has learned how to operate a computer or computer program "like a pro" in sixty minutes. Everyone needs to go through some kind of training process, no matter how informal, to learn how to take advantage of a computer's capabilities.

Some people like a live instructor to guide them through a new piece of software or a new hardware system. Others would rather work it out using self-instructional materials. Still others prefer to figure everything out for themselves.

The future favors the do-it-yourself group. Systems will become easier and easier to learn and use. In the meantime, however, the rest of us can benefit from training, either from someone else or from printed or electronic helps.

## FORMAL TRAINING

The more formal training provided by "live" instruction is not hard to find. You can sign up for training with your local computer group, at most computer stores, or with an independent organization, either profit or nonprofit.

Your best starting point is a computer

group. People in these groups are enthusiastic, their combined expertise is often quite high, and you can probably get your training at a very low cost. (You can usually pay only the price of membership—around \$25.00.) User groups have only a few disadvantages. Because they are peopled with volunteers, classes may be scheduled at inconvenient times and places and teaching skills may not be well-honed. But, by all means, check into them first.

Independents are next. Look for their advertisements in the business section of your local newspaper. A few franchise training outlets are beginning to appear, especially on the West Coast. They are more likely to offer quality training than computer groups; their materials may have been developed by a central organization, and their instructors may be better screened for technical and teaching qualifications. The principal advantage claimed by independent training outlets is their freedom from conflicts of interest. If a computer store teaches you, that

store will tend to steer you toward its own products. Independents have no such vested interests. However, independence of training organizations may be a sign that they don't have quite the technical expertise or, more important, any equipment they can let you use. Also, independent organizations charge about \$35.00 per hour.

By all means, look into your local community college. More and more schools and colleges are now offering adult education classes. Since you are not likely to see these classes advertised, you will probably have to call up to get a catalogue. Educational institutions price their computer classes according to the same scale they use for other types of instruction.

Buying training is like buying most anything else. It's important to know what you want and to do a little comparison shopping. Before you put your money down, ask the following questions:

1. *Who's the instructor?* Does he or she know the subject?
2. *What will I be able to do at the end of the course?* Ask for an outline of the course. Ask what you will be able to do as a result of your learning.
3. *Will I be able to get on a machine?* You learn by doing. If you can't practice on a computer, you may not learn much at all.

## SELF-HELP

If you prefer to learn on your own, rather than through more formalized instruction, there are several options open to

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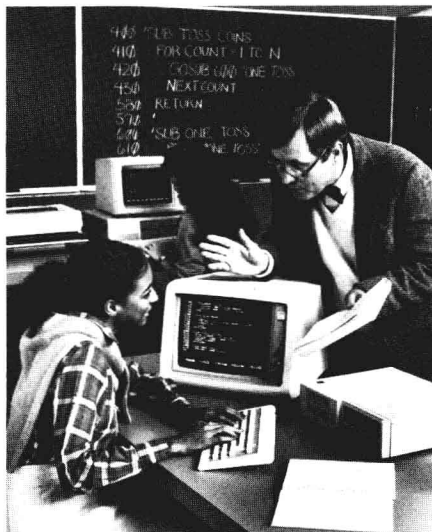


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