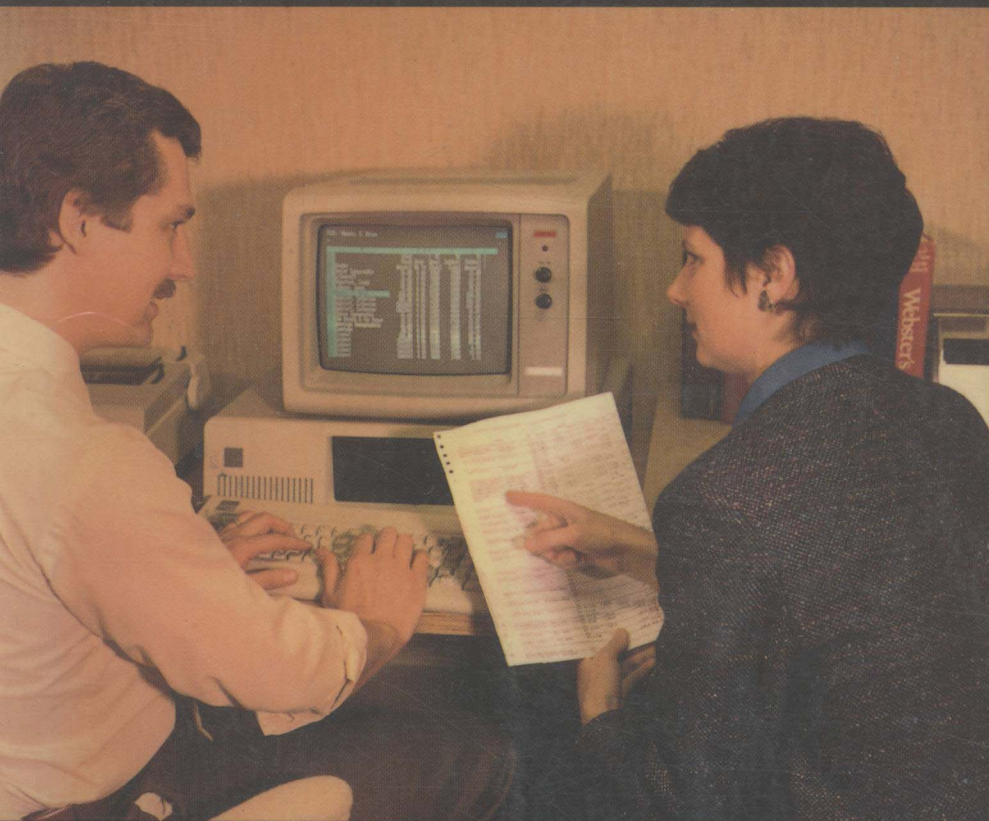


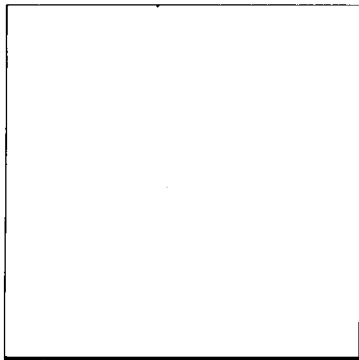
# BUSINESS APPLICATIONS USING THE IBM PC



Carolyn  
Meinhardt

Ralph  
Verno

Using: Word Star®, Lotus 1-2-3®, dBASE II, III, III+®,  
and Data Transfer Between Applications



# **BUSINESS APPLICATIONS USING THE IBM PC**

**CAROLYN MEINHARDT**

**RALPH VERNO**

**Using: WordStar®  
Lotus 1-2-3®  
dBASE II, III, III+ and  
Data Transfer Between Applications**



**Mitchell Publishing, Inc.  
Santa Cruz, California**

Dedication to Quality Publishing: All employees of Mitchell Publishing, Inc.  
Sponsoring Editor: Erika Berg  
Director of Product Development: Raleigh Wilson  
Production Management: Burgess and Associates  
Interior Design: Detta Penna  
Cover Design: Larry Lazopoulos  
Composition: George Lithograph Company  
Printing/Binding: The Viking Press

IBM is a trademark of International Business Machines Corporation.  
WordStar® is a registered trademark of MicroPro International Corporation.  
1-2-3® is a trademark of Lotus Development Corporation.  
dBASE, dBASE II, dBASE III, and dBASE III+ are trademarks of  
Ashton-Tate Incorporated.

©1987

Mitchell Publishing, Inc., a division of Random House, New York City  
Innovations in Computer Education  
915 River Street  
Santa Cruz, California 95060  
(800) 435-2665; in California, (408) 425-3851  
All Rights Reserved

LIBRARY OF CONGRESS CATALOG NUMBER  
86-062008

ISBN 0-394-39058-X

Printed in the United States of America

10 9 8 7 6 5 4 3 2



# PREFACE

Computing has moved from the world of the mysterious and the technically oriented to the realm of the end user.

Your challenge, as today's end user, is not to understand the technical inner workings of microcomputers or even the intricacies of programming. It is to efficiently and effectively integrate these powerful yet easy-to-use tools into the everyday operational and problem-solving activities of the business world.

Helping you meet this challenge is the primary reason for this book.

## **Who should use this book, and why?**

*Business Applications Using the IBM PC* is designed for use with an IBM PC or compatible. It was written to help students in a microcomputer applications course meet these primary objectives:

- to learn how to operate a microcomputer, use operating system software, and maximize computing resources by becoming a knowledgeable end user
- to become an effective user of the most popular full-power commercial software for word processing (WordStar), electronic spreadsheet (Lotus 1-2-3), and database (dBASE II/III/III PLUS) applications
- to apply with confidence these productivity tools to solve simple to more advanced real-world problems within business settings
- to multiply the power and usefulness of WordStar, Lotus 1-2-3, and dBASE II/III/III PLUS software by integrating these packages into one comprehensive business tool
- to gain an easy-to-use yet comprehensive reference guide that will be useful well into your business career

## **Organization and scope**

This book consists of five self-contained modules. Each module uses examples from The Answering Company, a telephone answering service, to demonstrate the application software in a realistic business situation.

This case study will help you become a more effective user of application software for two reasons. First, by presenting the capabilities of each package within the context of a business, you not only learn how to use these packages, but when and why to use them to successfully perform business applications

and solve common business problems. Secondly, this common thread shows you how the applications of word processing, spreadsheets, and database are related in the real world.

**Module 1** stresses the practical uses of microcomputers. You are introduced to microcomputer hardware and common computing terminology. You learn how to care for the hardware. Step-by-step, hands-on tutorials teach you how to “boot” the computer, install software, and create backup copies of data. This first module discusses the role of the DOS operating system and your responsibilities as a user. Some of the legal issues regarding the copying of software are presented as well.

**Module 2** covers the most practical and immediately useful application of microcomputers: word processing. Using WordStar, you learn how to write a business letter, develop business stationery, create an advertising flier, produce a multi-page business report, and even produce invoices which can be used individually or with MailMerge data files.

**Module 3** illustrates how to set up, store, manipulate, and retrieve data quickly in a variety of formats. Using dBASE III, one of the most powerful data management programs available, you learn how to plan for and design a database. Soon you will be creating a customer information database (that later you will expand to include billing information), calculating customer charges, and generating sales reports and logs of daily transactions.

**Module 4** teaches you how to run the most widely used electronic spreadsheet, Lotus 1-2-3, as a financial tool. In this module, you create a monthly sales report (that later you will expand with graphs), develop an integrated spreadsheet that combines the Chart of Accounts, General Ledger, Income Statement, and Balance Sheet for The Answering Company. The monthly journal entries for several months will be added, each month applying more advanced spreadsheet techniques.

**Module 5** draws on the files created in the earlier modules or obtained from your instructor's data disk. This “capstone” module illustrates how software packages can be integrated to maximize processing power. Procedures are developed to add information into the WordStar business report, to generate database sales information which can be manipulated with a spreadsheet, to add data from other sources to the database, and to sort word processing files.

## How to use this manual

First of all, it's easy. Once you have an IBM PC (or compatible microcomputer) with two disk drives and a minimum of 256K of RAM, this manual provides you with step-by-step, hands-on tutorials to quickly and easily master three of the most powerful commercial software packages available today.

Below are some of the features of this manual that were designed to help you learn.

**Flexibility:** You may use some or all of Modules 2 through 4, and in any order. They are completely independent.

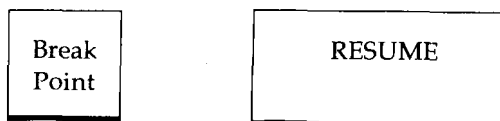
**Conceptual introduction:** Each module begins with an introduction to the strengths and potential uses of the particular type of application software.

**Task sections:** Each module is divided into sections containing the instructions for executing a particular application.

**Numbered steps:** All hands-on instructions are numbered.

**Breakpoints:** Lengthier sections of the text are divided into short, easily managed work sessions. You should be able to comfortably finish a work session during a 50-minute class period. A *Breakpoint* symbol is used to

indicate convenient stopping places, and *Resume* symbols contain needed instructions for picking up where you left off.



**Separate reference material:** When needed, software features and commands are described and boxed off from the rest of the text for future reference.

**Ample illustrations:** 50 to 70 screen displays per module allow you to monitor your progress.

**Simple to challenging:** Each module progresses from simple to more advanced commands and features. If you opt to skip the advanced topics in Modules 2 through 4, you can still use Module 5 to create an integrated business system. Simply copy the files you would have created in Module 2 through 4 from your instructor's data disk.

**Command summaries:** Each section concludes with a summary of the commands learned in that section.

**Practice exercises:** "Practice what you've learned" exercises in each section reinforce the material that has just been covered.

**Projects:** Each module includes four to six projects, ranging in difficulty from simple to challenging. These projects build on what you've learned and develop skills for future use.

**Additional commands:** In addition to Projects, each module contains a list of commands and features not covered in the manual should you choose to explore the software further on your own.

**Glossary and index:** The manual concludes with a list of terms defined in relation to their use in a particular application as well as a comprehensive and easy-to-reference index.

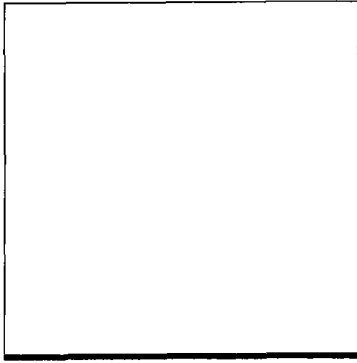
## Acknowledgements

The completion of a book such as this one is accomplished only with the guidance of professionals and the enthusiastic support of friends, peers, and family, for which we are grateful.

Thanks are due to the following teachers who provided helpful comments and suggestions each step of the way: Gary Armstrong, Shippensburg University; Joyce Dick, Northeast Iowa Technical Institute; Ralph Duffy, North Seattle Community College; Brett Ellis, University of Wisconsin at Eau Claire; Tom Haresing, Long Island University; Fred Kohun, Robert Morris College; Judy Scheeren, Westmoreland County Community College; John Schrage, Southern Illinois University at Edwardsville; Al Schroeder, Richland College; Dennis Severance, University of Michigan; Bill Spezeski, North Adams State College; Richard Tersine, University of Oklahoma; Ed Weihruch, Community College of Allegheny County; and Jeanne Wilequet, Houston Community College.

We specifically wish to thank Erika Berg from Mitchell Publishing for introducing us and guiding us throughout the project. Sincere thanks go to Antonio Padial for his excellent editing that proved almost anything can be said well in fewer words. We are also grateful for the ideas and professionalism of Barbara Pickard and Larry Lazopoulos of Burgess and Associates that made the finished product attractive and easy-to-read. We are very appreciative of Carolyn's sister, Christine Meinhardt, who donated many hours to testing the text for accuracy and clarity. Finally, our warmest thanks go to those who contributed daily patient support on the home front—Carolyn's husband, Jerry Foecke, and Ralph's wife, Ida.

Carolyn Meinhardt  
Ralph Verno



# TABLE OF CONTENTS

## **MODULE 1** **INTRODUCING** **MICROCOMPUTERS** **IN BUSINESS**

1. Entering the world of microcomputers 1
  - How this book can help you learn about microcomputers 1
  - Hardware and software 2
2. Person, meet your microcomputer 4
  - The computer system from the outside 4
  - The computer system from the inside 6
3. More about the keyboard 8
4. How's your memory? 14
  - Measuring memory 16
5. More about floppy disks 17
6. Getting started 20
7. Getting to know the equipment better 23
  - Similarities and differences between typewriters and microcomputer typing 24
  - DOS programs 25
8. The care and feeding of microcomputer systems 31
  - Using compatible software 31
  - Making back-up copies 31
9. Hardware and software requirements for this book 33
  - Installing software programs 34
10. Projects 35
11. DOS command summary 36

## Contents

2. Setting up a customer database	127
What is a database?	127
The parts of a database	127
How structure affects the capabilities of a database	128
Planning the database contents	129
3. The Answering Company's customer database	132
Creating a database	133
Displaying a database structure	134
4. Entering data into a database	136
Selecting a database to use	136
Adding new records	136
Displaying all records	140
5. Changing the data in a file	142
Changing records one at a time	142
Changing several records quickly	143
Deleting, recalling, and permanently erasing records	145
6. Selecting customer records	148
Using the help menus	148
Moving from record to record	150
Specifying conditions for record selection	151
Converting character strings into dates	152
Displaying specific fields	155
Partial field selections	155
Creating a file of selected records	156
7. Printing the screen display	158
8. Adding customer schedule information to the database	160
Modifying an existing database	160
9. Generating statistics	164
Counting records	164
Summing values in records	165
Performing algebra with fields	165
Using memory variables	166
Writing procedures	168
Pausing to receive data	168
Providing prompting messages	169
Controlling screen displays	170
10. Speeding things up	172
Shortcut sorting with indexing	172

## ADVANCED TOPICS 174

- 11. Recording sales—the telephone message database 174
  - Using ASSIST to create a database 176
  - Defining work areas 176
  - Using memo fields 179
  - Inserting values into fields automatically 179
  - Using the system date and time 180
  - Looping within procedures 181
  - Converting numbers into character strings 181
  - Changing text to all capital letters 182
  - Using procedures to create records 182
  - Writing simple reports with procedures 182
  - Converting dates into character strings 184
  - Linking multiple databases 184
- 12. Printing reports 187
  - Setting margins 188
  - Creating report specifications 188
  - Producing reports with stored specifications 194
  - Changing report specifications 195
- 13. Generating charge information automatically 197
  - Using logical testing in procedures 197
  - Producing reports with totals 200
- 14. Calculating invoice charges 204
  - Testing for end-of-file 206
- 15. Calculating sales information 209
  - Providing multiple choices within procedures 210
- 16. Projects 213
- 17. A comparison of dBASE II and dBASE III 216
  - The increased size of dBASE III 216
  - Command differences 217
  - Other significant differences 219
- 18. Additional dBASE III commands 220
- 19. Implementation changes for dBASE III+ 224
  - A new dBASE III 224
  - Instructions for using dBASE III+ 224
  - Additional dBASE III+ commands 230

**MODULE 4**  
**USING**  
**SPREADSHEETS**  
**WITH**  
**LOTUS 1-2-3**

1. Introducing electronic spreadsheets 235
  - What can you do with an electronic spreadsheet? 236
  - Introducing Lotus 1-2-3 236
  - Installing Lotus 1-2-3 236
  - Business applications 236
  - Starting up Lotus 236
  - Creating a new worksheet 238
  - Exiting from Lotus 239
2. The monthly sales report 240
  - Rows, columns, and cells 240
  - Value and label cells 242
  - Using formulas 242
  - Using functions 244
  - Correcting errors in a worksheet 245
  - Saving a worksheet 247
  - Using the Lotus help menus 247
3. Printing a report 249
  - Retrieving a worksheet 249
  - Printing on paper 250
  - Storing references to ranges of cells 253
4. Improving the appearance of the report 254
  - Dealing with excess characters 255
  - Changing the widths of columns 256
  - Changing the formats of labels 257
  - Inserting and deleting rows and columns 258
  - Copying the contents of cells 260
  - Changing the formats of value cells 261
5. A chart of accounts 265
6. The general ledger 268
  - Relative copying with formulas 270
7. Entering initial data into the general ledger 272
  - Recalculating a worksheet 272
  - Freezing horizontal and vertical screen borders 273
8. The income statement and the balance sheet 278
  - Printing out cell specifications 282
9. Printing the income statement and balance sheet 286

- 10. Entering another month's figures 290
  - Extracting and saving part of a worksheet 291
  - Combining worksheets 291
  - Protecting cells from changes 293
  - Using worksheet windows 296

## ADVANCED TOPICS 299

- 11. Monthly accounting using macros 299
  - What is a macro? 299
  - Planning and writing macro commands 299
  - Entering data with prompts 302
  - Using conditional statements 306
  - Stopping a macro with an internal command 306
  - Entering a macro into a worksheet 307
  - Naming a macro 307
  - Running a macro 308
  - Correcting or changing a macro 308
- 12. More Lotus commands 311
  - Moving parts of a worksheet to a new location 311
  - Checking global settings and available memory 312
  - Erasing worksheets 312
  - Using file commands 313
  - Deleting worksheets from permanent memory 313
- 13. Reporting sales trends 314
  - Using absolute cell addresses 316
  - More about functions 317
- 14. Graphs—Creating pictorial information 321
  - The types of graphs 321
  - Using worksheet data 321
  - Viewing graphs 322
  - Using labels and titles on graphs 325
  - Using legends 326
  - Saving graph settings 326
  - Printing graphs 327
- 15. Projects 332
- 16. Additional Lotus 1-2-3 commands 335

**MODULE 5**  
**TRANSFERRING**  
**DATA AND TEXT**  
**AMONG SOFTWARE**  
**PACKAGES**

1. Software and data integration 339
  - Getting started 339
  - The types of files 340
  - Using the module 341
2. Adding to the business report 342
  - Transferring text files between dBASE III and WordStar 342
    - Printing dBASE reports into files 342
    - Inserting text files into WordStar documents 343
    - Using dBASE's word processor 345
3. Automated invoicing 347
  - Transferring data files from dBASE III to WordStar using Mailmerge 347
    - Creating a file of selected records and data 347
    - Preparing a matrix form for use with a file 348
4. Transferring sales trend information 350
  - Transferring data files from dBASE III to Lotus 1-2-3 350
    - Preparing a worksheet to receive data 351
    - Importing data into a worksheet 353
5. Adding still more to the business report 355
  - Transferring text files from Lotus 1-2-3 to WordStar 355
    - Printing a worksheet into a file 355
6. Sorting customer lists stored as nondocument files 357
  - Transferring data from WordStar to Lotus 1-2-3—A one-way trip 357
    - Preparing the nondocument file 358
    - Importing data as values 359
    - Using Lotus as a database 359
    - Sorting data in a worksheet 359
7. Transferring text and data as text from WordStar to Lotus 1-2-3—A round trip 361
  - Importing data as text 361
  - Translating Lotus Worksheets into nondocuments 361
8. Adding potential customers to the customer database 364
  - Transferring data from Lotus 1-2-3 to dBASE III 364
    - Creating a file of worksheet data 364
    - Appending dBASE records from a file 365

9. Transferring data from WordStar to dBASE III	366
Preparing the nondocument file	366
Appending records to the database	367
10. Projects	367

**GLOSSARY 369**

**INDEX 377**

# 1

# INTRODUCING MICROCOMPUTERS IN BUSINESS

## 1. Entering the world of microcomputers

You are about to enter the world of microcomputers. If this is your first venture, you may feel some fear of the unknown as well as some excitement. Your fear will pass quickly, as you discover the friendly world of microcomputers and the terrific software that makes them so useful.

Until very recently, computers cost thousands of dollars, and people needed years of training to learn to operate them. Microtechnology has changed all that by making a complete computer available for a low price. Many small businesses now find microcomputers a cost-effective way to manage information and perform many office functions. What remains is for business personnel to discover the potentials of the microcomputer, and that will happen as they become familiar with the machines and the software that can be used with them.

### **How this book can help you learn about microcomputers**

This book teaches the basics of using an IBM-PC microcomputer (or a compatible) with some of the most powerful general application programs available today. It is intended for business students who are learning about computers and information systems. The book has five modules. The first introduces the microcomputer, and the next three teach the use of three important types of software: a word processor, a spreadsheet, and a database. The fifth module shows how to use the three software programs together to expand their potential. Carefully read and use Module 1 first. You can explore Modules 2, 3, and 4 in any order. Module 5 provides additional information for advanced integration applications.

Since this book is intended for people who are interested in business, you will apply what you learn to an imaginary firm called The Answering Company. You will use many of the features of each kind of software to create business records or perform office functions for The Answering Company. The additional exercises and projects in each module give more real-life practice in using the computer and software in a small business.

Each module is divided into several sections. Numbered steps indicate the order in which the work in each section should be done. Always follow the numbered steps and always complete one section before continuing with the

next – if you go ahead and “start in the middle” you will probably discover the instructions are assuming that you have already completed an earlier item and you will experience trouble getting caught up.

Features of the software products are introduced in the boxed paragraphs which appear throughout each module. These explanatory paragraphs can be used later for reference. Included in the exercises for each section are instructions for storing summary information about each of the new features introduced in that section. If you complete all of these exercises, by the end of the module you will have a complete quick-reference list.

Illustrations throughout the text clarify the instructions or indicate what you should see on the computer screen at that point. Each module contains a list of additional software features not covered in detail in the module. For more information on those additional features, refer to the user’s manuals that accompany the software packages. Also, a glossary of terms is included at the end of the book.

## Hardware and software

Many beginning computer users are intimidated by computer jargon. In just these first paragraphs, you may have seen a few unfamiliar words. Here are a few introductory definitions.

**Microcomputer:** A *microcomputer* is a complete computer, able to receive information, process that information, and make it available to the user in some form. It has a microprocessor that can handle both text and numbers. A microcomputer differs from larger computers not only because it is smaller (it fits on an ordinary desk) but also because it is cheaper, (it usually costs under \$4,000 complete), can be used all by itself, (it is not dependent on other computers), and has a smaller internal memory. (This term is explained in the section on memory devices.)

Computers are changing and improving at a phenomenal rate. The above “1987” definition helps to differentiate microcomputers from *minicomputers*, which have larger capacities and are able to do more. However, some of today’s microcomputers would have been called minicomputers just three or four years ago. As computers become more powerful, less expensive, and smaller, the perception of what is a “microcomputer” changes as well.

**IBM-PC and compatibles:** This book is intended to be used with the IBM-PC, described in greater detail in the section “Hardware and Software Requirements.” Rival companies have used the IBM-PC as a standard for developing many other microcomputers, often called *IBM compatibles*, or just compatibles for short. These compatibles either simply copy the IBM-PC design or improve some part of it. A resulting problem is that these improvements make the final product different from the IBM-PC in some respect. When programmers write software for use with the IBM-PC, they make sure that the software works perfectly on a standard IBM-PC. A compatible may be better than the IBM-PC in some ways, but the differences may also create problems with certain software.

The instructions in this book were verified by testing the software and the examples on both an IBM-PC and a compatible, the Leading Edge microcomputer. Most microcomputers that claim 100 percent or even 90

percent compatibility have no trouble running software intended for the IBM-PC, but not always. So buyers, beware! Insist on seeing a software package run on the machine you want to use before you spend the money for either.

You've already seen the words *hardware* and *software*. Here are some definitions.

**Hardware:** *Hardware* is any piece of equipment used as part of a computer system. It includes the microcomputer, add-on optional computer parts, printers, memory storage devices, and other physical equipment. Printed and wired circuit boards that may contain permanent instructions are also hardware (instructions of this type are sometimes called *firmware*).

**Software or programs:** Computers are completely useless unless you tell them what to do. The sets of instructions a computer follows are called *programs* or *software*. The instructions are written in a programming language and usually stored permanently on a memory device. When the computer "reads" the software, the instructions are changed into electrical currents that cause the computer to respond in a predetermined way.

You can think of the software as analogous to a phonograph record. The music corresponds to the program. Each is stored on a physical device. The music is translated into grooves on a record, and the program is translated into magnetic charges on a memory storage device, such as a floppy disk. When you buy the record, your intent is to buy the music stored on the record; when you buy software, you are buying a floppy disk that contains the software program. (The term *floppy disk* is explained in the section on memory devices.) The phonograph plays the record much as the microcomputer reads the floppy disk.

In summary, microcomputers are machines that process information. They are designed to do essentially the same kind of tasks as larger computers, called minicomputers or mainframes, but microcomputers have less capacity, are generally smaller, are less complex to use, and cost less. The physical parts, including the firmware, are called hardware, and the stored instructions are called software.

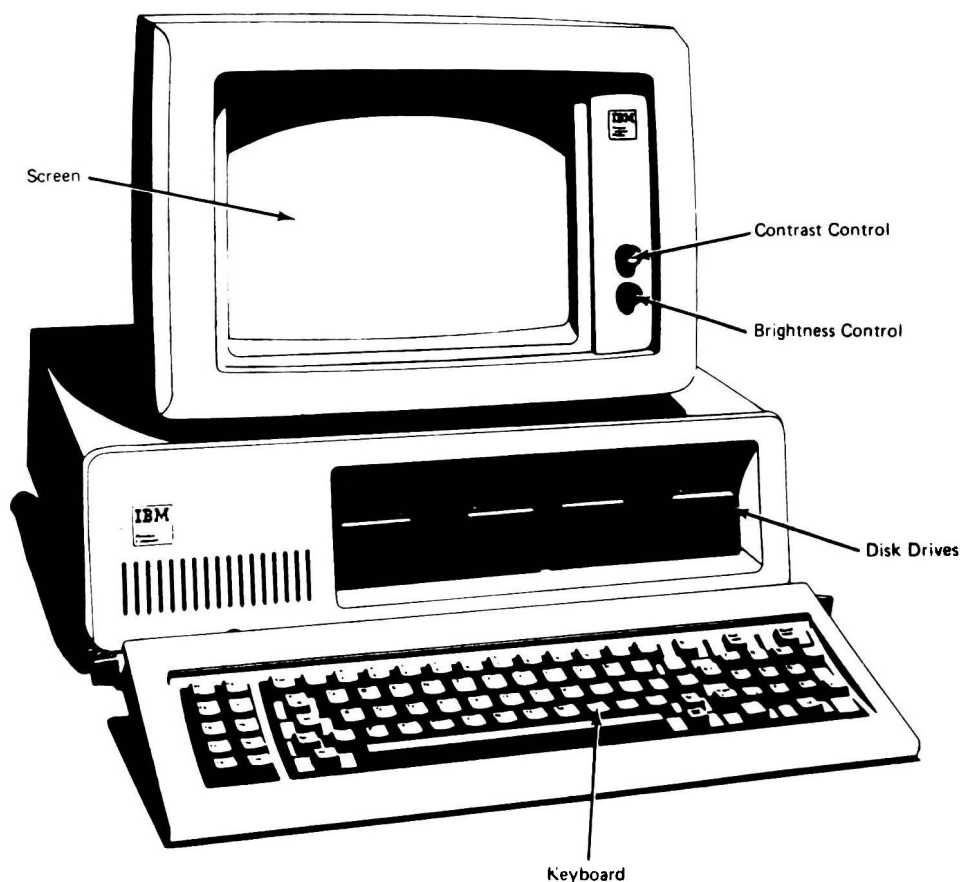
### Practice what you've learned

1. Using recent issues of newspapers or magazines, list ten brands of microcomputers.
2. Indicate which of the microcomputers are IBM-PC compatibles.
3. Using recent issues of newspapers and magazines, list the names of ten software products.
4. List the purpose of each product and indicate with which computers it is meant to be used.

## 2. Person, meet your microcomputer

Getting to know your microcomputer is much like meeting an unfamiliar person. First impressions are important. If you get off to a bad start or are never properly introduced, you may put off getting to know the newcomer better. Although the computer is exceptionally dependable, it does not always respond in the way you might expect. You must learn to “speak its language.” It will usually tell you immediately if it doesn’t understand what you are trying to tell it to do. Remember, there is virtually nothing you can do to harm it just by pressing its keys. Begin by learning about the parts of a microcomputer. The following description is of the IBM-PC, but you will have no trouble finding the corresponding parts on a compatible. The picture shows the outside of a typical IBM-PC system.

IBM-PC System  
with printer



### The computer system from the outside

As you read this section, try to find each part on your microcomputer.

**The computer body:** All of the working parts of the computer are contained in the box which is called the computer *body*. The heart of the computer, called the *central processing unit* or *CPU*, is located on a circuit board inside the body. The two *disk drives*—the parts that read the floppy disks—are incorporated into the body, but in some other IBM models and