Dow Jones·Irwin Desktop Publishing Library

Desktop Publishing IBM® Edition

John A. Barry,
Frederic E. Davis,
with Phillip Robinson

Desktop Publishing

IBM® Edition

John A. Barry
Writer, editor, and etymologist

Frederic E. Davis
Editor of A+ Magazine and specialist in information technology

Phillip Robinson
Writer, editor, publisher

DOW JONES-IRWIN
Homewood, Illinois 60430

Acquisitions editor: Susan Glinert Stevens, Ph.D.
Project editor: Paula M. Buschman
Production manager: Carma W. Fazio
Printer: Malloy Lithographing, Inc.

Library of Congress Cataloging-in-Publication Data

Barry, John A.
Desktop publishing / John A. Barry, Frederic E. Davis, Phillip Robinson. – IBM ed.
p. cm.
Bibliography: p.
Includes index.
ISBN 1-556-23063-X
1. Desktop publishing. I. Davis, Frederic E. (Frederic Emery) II. Robinson, Phillip R. III. Title.
Z286.D47B375 1988 88-4569
686.2′2–dc19 CIP

Printed in the United States of America

1 2 3 4 5 6 7 8 9 0 ML 5 4 3 2 1 0 9 8

Introduction

Desktop Publishing, IBM Edition, is the fourth book in the Dow Jones-Irwin Desktop Publishing Library. This book is for anyone who wants to use a PC, PS/2, or compatible computer for desktop publishing, which we define as the use of a PC or PS/2, along with writing and graphics software and page layout software, to produce printed material. Whether or not you already have a PC or PS/2 for desktop publishing, or whether you're contemplating the purchase of one for that purpose, you'll want to have this comprehensive reference book by your side. *Desktop Publishing, IBM Edition*, is for people who want or need to use their PC or PS/2 to publish their own newsletters, reports, books—whatever—and save time and money in the process.

Soon after IBM introduced the PC back in 1981, other companies began making computers that were partially or entirely compatible with the PC. Partial compatibility often meant that these systems could run programs that had been written for the PC's operating system. Complete compatibility, or as complete as any computer could actually achieve without literally and illegally copying the IBM PC, meant the ability to run programs written for the PC and to work with peripheral hardware designed for the PC.

Most systems that claim "compatibility" today strive for complete compatibility. There are almost always a few points where they fall short of that goal—differences between these compatibles, or "clones," as the least expensive compatibles are sometimes labeled, and the PC itself. A few programs won't run right, and some peripherals, such as plug-in cards with additional functions, don't operate smoothly. These incompatibilities sometimes even arise between the PC and later members of the PC family from IBM itself: the XT, AT, and so forth.

In 1987 IBM began selling an entirely new family of personal computers—the Personal System/2 computers—a family that had its roots in the PC family and was compatible with PC software (though not with some PC peripheral hardware).

The methods and products of desktop publishing are largely the same

for all of the PC, PS/2, and compatible systems, so in this book we'll often treat them as a class. The phrases "PC and PS/2" and "PC or PS/2" also refer to the compatible systems. When we describe products that don't run on all systems, we'll mention the known incompatibilities. However, with hundreds of PC, XT, and AT compatible computers issuing from as many companies, and with the frequent small changes these companies make in both hardware and software, no one can can possibly list or even know all incompatibilities. If you're concerned about the compatibility of your system or software, you should ask your dealer when you are shopping.

Here is a brief road map to the book:

Desktop Publishing, IBM Edition, is composed of four parts. We've structured the book so you can read it its entirety if you wish, or you can concentrate on the parts that most interest you, perhaps skimming the rest.

Part 1 is an overview of publishing. It explains how desktop publishing evolved from and incorporates previous publishing technologies. It introduces desktop publishing on the PC or PS/2 and categorizes the four types of publishing for which a PC or PS/2 system is best suited.

Part 2 is the heart of the book. It goes into detail about the PC, PS/2, and compatibles family of computers and guides you through the major application software that turns your PC or PS/2 into a desktop publishing system. Major applications covered are word processing and graphics. Two chapters are devoted to the software foundation of desktop publishing: page layout programs and page description languages. Because desktop publishing involves more than merely producing attractive pages, this part of the book also examines communications, database, and number processing software—all of which help turn a PC or PS/2 into a complete system for researching, producing, and managing publications. Part 2 also covers output devices such as laser printers and typesetting machines and input devices such as digitizers and scanners, as well as hardware such as modems, for data communication, and mass storage devices, for networking and data archiving. This part of the book is a guide to the major desktop publishing products for PC and PS/2 computers.

Part 3 examines the process of desktop publishing, from gathering your materials to marketing your publication.

Part 4 elaborates on the four publishing categories introduced in Part 1: corporate publishing, periodical (with a concentration on newsletters) publishing, book publishing, and personal publishing.

Complementing the extensive product information in the book is a bibliography and a glossary.

Although we have made an effort to accurately describe most major desktop publishing products for the PC and PS/2 in this book, we cannot guarantee the accuracy of all material in it. Bear in mind that companies announce new products continuously, make upgrades to previous products, and raise and lower prices. All lists prices in this book are suggested retail; you may pay more or less, depending on where you buy a given product. Companies also tend to change addresses and phone numbers. Before you make major purchases, we suggest you consult with manufacturers and dealers and read magazines, just to ensure that you get the most up-to-date information.

A Word of Advice about Buying

Something to keep in mind when selecting hardware and software for a desktop publishing system is to pay more attention to the difference between good enough and not good enough than to the difference between good enough and the best. Desktop publishing has established itself as a major area of personal computing and is supported by a wide variety of hardware and software. Before considering equipment purchases, it's a wise idea to determine what your needs are. Sometimes it's handy to write down a needs analysis listing what your desktop publishing system must do, what you would like it to do, what is nice but not necessary, and so forth. Knowing clearly what your needs are will help you avoid making purchasing mistakes, which can be costly.

Once you've decided what your needs are for your particular application, you can then start to look at hardware and software products. You will probably find that some products are not good enough, others are good enough, and yet others are considered the best. It is easy to be dazzled by the best and be tempted to purchase these products. Your application may not demand the best, however; it may only need

something that is good enough, and you may end up spending a lot more money than you need to if you purchase something that offers advanced capabilities that you will seldom, if ever, use.

By carefully considering what you need, you will avoid two common pitfalls in purchasing computer products: first, not buying equipment that is capable of performing your task and, second, being oversold and spending much more than you need to accomplish your task.

How This Book Was Desktop-Published

We used PC and PS/2 computers and compatibles and Microsoft Word 4.0, along with Apple Macintoshes and Word 3.0 for the Macintosh, to write and edit the book. Page layout, page-proof printing, and typesetting were performed at LaserWrite of Palo Alto, California.

Acknowledgements

The following people and organizations made valuable contributions to the completion of this book: Jim Barry, Dee Cravens, Robin Davis, Bill Gladstone, Susan Glinert, Bill Jackman, Eva Langfeldt, LaserWrite, Brenda McLaughlin, Ann and Heather Romanik.

This book is for Eva, without whose assistance and moral support this book series could not have been completed, and for Sean, with whom coauthor Barry may soon be able to spend some time.

Contents

PART 1 Desktop Publishing Overview

Chapter 1 The Evolution of Desktop Publishing **2**
Chapter 2 Desktop Publishing on the PC, PS/2, and Compatibles **8**
Chapter 3 Publishing Categorized **24**

PART 2 The Tools of Desktop Publishing

Chapter 4 The PC and PS/2 (and Compatibles) **34**
Chapter 5 PC and PS/2 Software **82**
Chapter 6 Page Layout Software **148**
Chapter 7 Page Description Languages **168**
Chapter 8 Desktop Communications **186**
Chapter 9 Output Devices **216**
Chapter 10 Input Devices **244**

PART 3 The Process of Desktop Publishing

Chapter 11 Gathering Your Materials **280**
Chapter 12 Writing and Editing **286**
Chapter 13 Design **306**
Chapter 14 Printing **338**
Chapter 15 Marketing and Distribution **346**

PART 4 The Realm of Desktop Publishing

Chapter 16 Corporate Publishing **362**
Chapter 17 Periodical Publishing **370**
Chapter 18 Book Publishing **382**
Chapter 19 Personal Publishing **388**

Appendix A Selected Bibliography **396**
Appendix B Grammar and Punctuation **402**
Glossary **407**
Index **419**

Chapter 1

The Evolution of Desktop Publishing

Publishing is the distribution of printed materials, but the publishing process also encompasses various other areas such as art, language, research, and marketing. Because of this broader scope, a broader definition of publishing is "the technology of written communication." Desktop publishing, the latest step in the evolution of that technology, is a new use of personal computer systems as an aid in the preparation of printed material.

Publishing is one of the largest industries in the United States and represents almost $100 billion dollars' worth of business each year—roughly 3% of the nation's gross national product (GNP). Recent statistics rank publishing (which includes printing) first in the total number of business entities out of all U.S. manufacturing industries. The government estimates that the country supports more than 50,000 publishing and printing businesses ranging from giant conglomerates to small operations. About 80% of publishing businesses have fewer than 20 employees. Because of the size and importance of the publishing and printing industry in the United States, it is easy to see why desktop publishing is such an important and far-reaching technology.

HISTORICAL OVERVIEW OF PUBLISHING TECHNOLOGY

The history of publishing coincided with the development of written languages. Paper, which was originally made from mashed papyrus, became the primary vehicle for printed material. Parchment was first widely promoted as a surface for writing in about 170 B.C. by Eumenes, the king of Pergamus. Later, around the time of Christ, the Chinese philosopher Wang Ch'ung used bamboo to create a writing surface. Ts'ai Lun, another Chinese philosopher, created the first known examples of paper as we know it today in 105 A.D. Wei Tang, another early Chinese publisher, used lampblack to create an ink for block printing about 400 A.D.

Early "publications" were hand-copied on pieces of paper or other writing surfaces and were only occasionally bound to make books. The first forms of printing, however, involved carving a message, usually on a piece of stone or wood, coating it with some type of ink, and pressing that plate against a piece of paper to make an impression. Very early publishers used this process more for reproducing artwork than for

printing characters, since images had to be carved in reverse, and it was difficult and tedious to carve written characters for text; also, a large portion of the populace was illiterate.

Movable Type

A major milestone in publishing technology was movable type. The best-known movable-type pioneer was Johannes Gutenberg (ca. 1390-1468), who combined the concepts of movable type and printing presses to create one of the first practical publication systems. Although Gutenberg is credited by many with inventing movable type, he was actually a Johnny-come-lately. A clay disc found in the ruins of the palace of Phaistos on Crete provides evidence that movable type existed as early as 1500 B.C. Also, printing from movable type was a well-known art in China and Korea several hundred years before Gutenberg. In 1041 the Chinese typographer Pi-Sheng created characters from hardened clay; the results were only fair. By the middle of the 1200s, however, movable type was being cast in bronze in the Far East. The oldest known work printed from movable type in Korea has been dated at 1397 A.D.—only a few years before Gutenberg's work.

It was 1440 when Gutenberg, without knowledge of the work done in the East, invented his own version of movable type. Movable type à la Gutenberg works on a letterpress, which pushes a piece of paper against solid pieces of type. When the paper comes off the press, it has slight indentations where the type has made contact with it. Gutenberg's invention was revolutionary because at that time, all the books in Europe were painstakingly and tediously handwritten by scribes. His method of assembling individual characters into blocks for printing on a press with ink on paper caused a significant change in publishing that had major repercussions in the worlds of science, art, and politics, among others. Gutenberg's invention of movable type in the 1400s, and the proliferation of printed materials that followed, marked the end of the Middle Ages and the beginning of the Renaissance.

Type continued to be set by hand for several hundred years after Gutenberg. By the time Benjamin Franklin was setting type in the late eighteenth century, publishing visionaries were working on the idea of typesetting machines—without much success, however.

The first typesetting machine that worked fairly well was invented by Dr. William Church, an Englishman, in 1822. Although Church's invention was innovative, it didn't do a good enough job to work in large printing operations. The first commercially viable typesetting machine was the Linotype, invented by Ottmar Mergenthaler in 1886. Other significant typesetting machines were the Monotype, invented by Tolbert Lanston of Washington, D. C., in 1887; the Ludlow Typograph, originally designed by Washington I. Ludlow in 1906 and developed further by William A. Reade; and the Intertype, developed in 1911. The Linotype, Intertype, and Ludlow machines all cast slugs of type that consisted of a solid line of type and its associated leading in a single block. The Monotype, in contrast, cast individual pieces of type and automatically placed them in justified lines.

The Linotype typesetting device marked the beginning of automated typography. Although Linotype machines marked a significant evolution in publishing technology, they also had many drawbacks. Printers had to double as metallurgists and melt a great deal of lead to create lines of type. Mistakes were cumbersome to remedy.

The Linotype remained the predominant form of typesetting machine until the early 1950s, when CRT typesetters were first developed. A CRT typesetter was based on cathode ray tube technology similar to that of a television set. The development of CRT typesetters marked the beginning of electronic phototypesetting, which has remained the major publishing technology.

Photography's Part in Publishing

Developments in photographic technology also influenced the publishing industry. In 1826, Joseph Niepce made the first metal engraving by coating a metal plate with bitumen, exposing it to light as in photography, and etching it after the image was developed. In 1839, a scientist named Ponton discovered that potassium bichromate was light-sensitive. This discovery led to Fox Talbot's 1852 creation of the first halftone engraving using gelatin mixed with potassium bichromate. Talbot placed a screen of fine gauze between a plate of metal coated with the special gelatin compound and a negative of the original picture and then exposed it to light to create the first known example of using a

screen to create the dot pattern that makes up screened images (and bit-mapped computer graphics).

Photoengraving developed fairly soon thereafter, and by 1871, the process was perfected to the degree that it became useful for letterpress printing. By the 1880s photoengraved illustrations started replacing woodcuts in books and magazines. Around the same time, another graphics-arts pioneer named Stephen Horgan used a very coarse screen to make the first halftone photoengraving used for commercial printing. Horgan's halftone was printed by lithography in the *Daily Graphic* of New York, which claimed to be the nation's first newspaper to use pictures for reporting news. The early black and white halftones soon led to the use of screens in color process printing. Color process materials using this early method of color separation were first printed in 1893; a derivation of this same method remains the predominant method of color printing in use today.

PUBLISHING TECHNOLOGY TODAY

Four methods of producing type are in use today: cast metal, or hot type composition; typewriter or strike-on composition; photographic typesetting (or phototypesetting), and digital typography. The last three methods of typesetting are referred to as "cold type" because they do not involve cast metal. Cold type includes not only typewriters, but press-on type and transfer lettering as well; photographic typesetters, which store an actual image of each type character; and digital typesetters, such as the PostScript typesetters used in desktop publishing. Hot type involves cast metal type, regardless of whether it is set by hand or by machine, and is a rarity today.

To set type by hand, you assemble individual metal characters into lines. You hold a composing stick in one hand while you select letters from a type case with the other and place the letters in the stick one by one until a full line of type is set. You then select thin pieces of lead to insert between the words in order to justify the line of type. To control line spacing, you insert metal strips or slugs (known as leads) between the lines; this process gives us the term *leading* (the spacing between lines). Machine-set hot type is cast a line at a time by an operator who forces molten metal into character molds.

Phototypesetting uses three components: an image library of all the type characters, a light source, and a light-sensitive material such as photographic paper or film. CRT typesetters use a cathode ray tube to create scan lines that are transferred to photographic paper or film. CRT typesetters are still prevalent, but laser-driven typesetters such as the Linotronic 300 are capable of resolutions of 1200 dots per inch (dpi) or higher and are rapidly becoming more prominent. (A 1200-dpi resolution, for example, means that the typesetter can squeeze 1,440,000 individual dots—i.e., 1200 horizontal by 1200 vertical—into a square inch.) These laser devices have overtaken CRT typesetters in popularity because they are more versatile and faster. Many of these devices can set type from page layout and other desktop publishing software.

Despite these advances in technology, a popular, inexpensive method of do-it-yourself typesetting and page layout still persists. This "typesetting" consists of using a typewriter or computer printer to print the text, which is then laid out by hand and pasted up on a sheet of paper, along with perhaps some press type for headlines and possibly some graphics. A photocopy machine takes care of the printing. This method is rapidly yielding to personal computers, such as the PC and Apple Macintosh, and laser printers, however.

Some small publishing houses still use letterpresses because this technology yields finely crafted printing that is desirable for certain art and other books, but use of movable type and letterpresses will remain only as a specialized craft.

Today, most typesetting professionals use digital typesetting machines. With the hardware and software to support them, digital typesetters are currently expensive. A complete system can cost anywhere from $30,000 to $100,000 and up. One reason for this high cost is that the typesetting device requires custom equipment to drive it. Desktop publishing technology, which deals primarily with digital typesetting machines, will reduce the cost of producing typeset materials because it makes the text-entry and formatting system independent of the typesetting device. A general purpose personal computer such as a PC, PS/2, or compatible can control much of the typesetting process. When true phototypesetting is not necessary, a PC with a laser printer can produce acceptable final copy.

The next phase in the evolution of publishing is what has come to be know as "desktop publishing."

Chapter 2

Desktop Publishing on the PC, PS/2, and Compatibles

The Apple Macintosh computer was largely instrumental in kicking off the phenomenon that has come to be known as desktop publishing. Its built-in graphics and intimate link to Apple's LaserWriter laser printer gave it the initial edge. The IBM PC family—including the XT, AT, PS/2, and all compatible computers—soon joined the desktop publishing movement. New software provided it with the graphics of the Macintosh, and a profusion of laser printers gave it the necessary output channel. Because the PC had previously established itself as the most popular personal computer for business in the United States, a huge demand developed for desktop publishing software and hardware that would work with PCs and compatibles.

This book in our Desktop Publishing Library deals with the PC and PS/2 families of computers and with all of the "compatible" computers that run PC and PS/2 software and peripherals. It describes how to use those computers as the foundation for a desktop publishing system. Anyone with a PC system has the potential to become a desktop publisher. Before we start our overview of desktop publishing on the PC and PS/2, however, we have to answer a question.

WHAT IS DESKTOP PUBLISHING?

"Desktop publishing" is probably the hottest topic in contemporary computing. Scores of people and companies are jumping on the desktop publishing bandwagon. Seminars and conferences devoted to desktop publishing are springing up everywhere. The term, which was allegedly coined by Paul Brainerd, president of Aldus, the maker of the popular PageMaker program, is on the lips of many people.

But all the people who are bandying the term about aren't necessarily using it to mean the same thing. What, for example, constitutes a desktop publishing system? Does it merely have to fit on top of a desk? How big can the desk be? Is the price of the system a consideration? Can a turnkey publishing system be considered a desktop publishing system? Is "desktop publishing" synonymous with "electronic publishing"?

We define desktop publishing as the use of personal computers (sometimes called "workstations"), digitizers and scanners (if applicable), writing and graphics software, and page layout software to produce printed materials. Desktop publishing also involves data com-