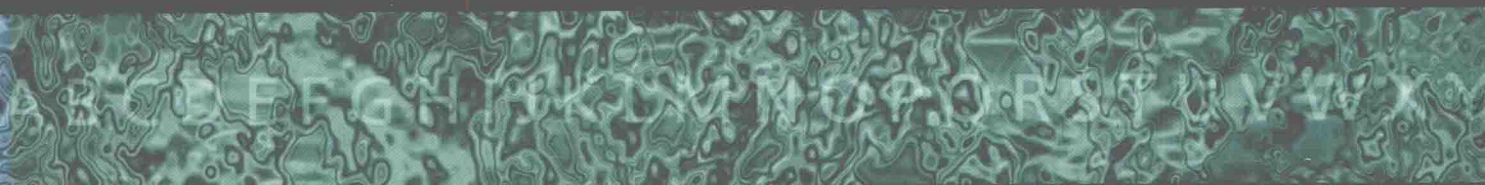


GRAPHIC DESIGN



PRODUCTION  
TECHNOLOGY



MARTIN L. GREENWALD

JOHN C. LUTTROPP

GRAPHIC DESIGN



PRODUCTION  
TECHNOLOGY



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# Graphic Design and Production Technology:

*A Note from the Authors*

In many disciplines, subject matter undergoes little, if any change from year to year. However, those areas affected by technological change should undergo content review and analysis at frequent intervals. Graphic design and the production technologies have been affected by technological change and related computerization as much, if not more, than any other sector of the industrialized economy.

*Graphic Design and Production Technology* has been tailored to the needs of students in the visual arts and technology-related disciplines. For the graphic designer, familiarity with the options available to bring a design to completion is invaluable. For the production technologist, first-hand knowledge of the design process allows for more sensitivity to the creative elements of the printed page, an aspect often overlooked in technical training programs where emphasis stresses function rather than underlying form. The development of a mutual understanding and respect on the part of each enhances the performance and accomplishments of both.

With respect to these objectives, the following are highlights of the organizational strategy of *Graphic Design and Production Technology*.

## **The Problem Solving Design Model**

The creation of any graphic design piece is really a solution to a specific communication problem. Problems are best solved in a methodical way that incorporate a step-by-step approach, enabling not only a full understanding of the problem but researching all of its related aspects in order to come up with the best solution possible. Problem solving strategies are not new, but have undergone a rebirth in recent years. Students can use the graphic design problem-solving model to define, research and solve a variety of design and production problems.

## **Comprehensive Coverage of Each Step in the Design and Production Process**

From producing thumbnails to post-press finishing techniques, this text highlights the stages that the graphic designer must master to become not only an effective communicator but knowledgeable about all of the processes needed to bring a design concept to completion.

## **Examination of Techniques Used to Digitize and Manipulate Data**

Strategies and techniques related to data input and manipulation available to the graphic designer and production technician is constantly changing. While specific techniques applied to input and digital editing will change as software and hardware are continually upgraded, it is the knowledge of the concepts that underlay these techniques that is most important. *Graphic Design and Production Technology* highlights and

emphasizes these concepts to help provide the designer and technologist with a broad-based conceptual foundation.

### **An Overview of the Historical Context of Graphic Communications**

It is not enough to simply know about design. A good designer understands and appreciates the role of design and communication within the world community, and how that role came to be. *Graphic Design and Production Technology* provides an overview and examination of some of the events that highlight humankind—from the first creative expressions that appeared on cave walls in Europe, to the design and production of microprocessor circuitry and high-speed computers.

### **Web Design Basics and Multimedia Concepts**

An increasing number of graphic designers are applying their talents towards Web and multimedia projects. In *Graphic Design and Production Technology* we offer an introduction of how pages for the World Wide Web are put together, as well as the steps involved in designing computer interactive multimedia titles. The emphasis here is on design concept and production techniques to provide a foundation for further explorations in specific applications related to Web and multimedia design.

### **Culminating Experiences for the Student**

These projects back up and reinforce lessons and exercises in the text. Coupled with an Instructor's Supplement, these projects are designed to build on the concepts presented in the text with an eye towards enhancing student understanding as well as providing a foundation for portfolio development.

## Preface

The use of computers has revolutionized not only the processing of information and the graphic arts industry, but also the educational institutions that offer programs focusing on these technologies. Until a few short years ago, company newsletters were routinely sourced out to businesses called service bureaus which handled all of the design, typesetting, and printing functions. Today, with the advent of affordable computer technology and powerful software packages, much of this work, including the printing, can easily be handled in-house.

Until recently, expensive color scanners were required to separate an original color photograph into the four separate color separation negatives necessary for printing the picture. However, using current technology, color pictures from the family vacation can be transferred from digital camera flash memory cards directly into a computer or onto a compact disc. From there, the pictures can be imported into a photographic manipulation program where they are modified and personalized. The pictures can either be printed on a high-resolution color printer, displayed on the family television set, or output to a digital typesetter or color copier for further processing or printing. Advances in digital photography now allow us the flexibility of selecting either conventional or digital cameras, both of which are in easy-to-use, point-and-shoot formats.

To keep up with the almost unbelievable pace of technological innovation affecting both graphic designers and printing technicians, curricula, equipment, and courses within the graphic arts must be continually updated. Computers purchased just two years ago are stretched to the limits of their memory and processing capabilities when running current software packages. Second- and third-generation software-driven typesetters have been obsolete for more than ten years. Level I Postscript® typesetting equipment strains to recognize the command structure of current Postscript® command strings. Early obsolescence is hastened by ongoing advances in computer operating systems and platforms, the continuing evolution of central processing chip technology that has passed the 1,000 MHz cycle level, and 1,000-fold increases in disk drive capacities. Many new computers no longer come factory-equipped with conventional floppy disk drives. Hard drive systems thought to be rock-solid in performance and technological sophistication are driven from the marketplace by ever-smaller, faster, and more efficient drive technologies. Sophisticated software application programs currently have memory requirements that were thought to be impossible only a year or two ago.

Many of the courses in graphic design and production techniques taught on both the secondary and post-secondary levels have evolved into two distinct categories: those that focus on creative, graphic design-oriented activities, and those that focus on production-oriented activities. The shortcomings of this course approach are obvious. Students educated with a strong background in the creative arts know little of what happens to a design when it leaves the drawing board or computer screen;

students with strong technical backgrounds in production-related programs are weak in many of the creative aspects of design and layout strategies.

Within business and industrial settings, these weaknesses are often manifested as a lack of communication among different levels in the design and production process. For example, when engineers design a product that encounters difficulty in some stage of manufacturing or production, the design engineer needs to talk to the production technologist to solve the problem. If the technologist and engineer are familiar with each other's tasks, communication between them is easy and the problem-solving process can proceed. Similarly, when graphic artists, graphic designers, and printing technicians have a working knowledge of both the design and production ends of the communication process, then the entire process is streamlined. In this environment, the graphic designer or production technologist is, by virtue of his or her comprehensive knowledge base, a more valuable employee. Also, due to the influence of the computer and associated software programs in virtually every aspect of business, a measure of graphic arts training is increasingly required for all employees, regardless of their specific job titles. People in human resource relations and training, management, and quality control technology all need to know how to get the printed message across in an effective, efficient manner.

Given this dichotomy of traditional education in the graphic arts, the purpose of this text is to bring together the areas of creative graphic design and production technologies under a single instructional umbrella. Ideas and concepts are presented and followed from the initial inception of a job to the printed and finished product.

*Graphic Design and Production Technology* has been tailored specifically to the needs of students in the visual arts and technology-related disciplines. For the graphic designer, familiarity with the options available to bring a design to completion is invaluable. For the production technologist, first-hand knowledge of the design process allows for more sensitivity to the creative aspects of the printed page, an aspect often overlooked in technical training programs where the emphasis stresses function rather than the underlying form. The development of a mutual understanding and respect on the part of each enhances the performance and accomplishments of both.

Within this framework, the authors have carefully avoided what they consider to be in-depth coverage of areas and skills that would ordinarily fall under the auspices of more traditional texts directed toward training printing production personnel. Also, there needs to be a recognition on the part of both graphic designers and production technicians of the profound effect and influence that digitization will have on the communication technologies in the near future and how this influence will affect the direction of instructional programs. Traditional technologies at both the design and production levels will continue to undergo many changes in the

coming years. Educational programs will need to stay abreast of these changes. More importantly, students educated within this constantly changing technological landscape will need to be adaptable. The philosophy that guides this text is the belief that knowing how and where to find information, rather than memorizing information, is the key to a successful future in the workplace.

An additional key point in the philosophy of this text concerns the placement of traditional skills and technologies within the framework of an ever-changing technological landscape. Technological advances continue to gain strong footholds in the traditional printing production areas; the old labor-intensive methods are beginning to disappear. This raises the question, "Why learn old technologies and outdated production methods?" There are several answers to this question. The first and most important answer is that knowledge of, and experience with, the foundations of basic technological processes gives the technician and designer insights into modern processing techniques they would otherwise not have.

This text therefore begins with an introduction to graphic communication design and production, highlighting a description of the creative input and production technologies that form the graphic communication process.

It has been said that the second part of the history of the world and the arts began with the invention of printing. An historical perspective of the development of the graphic communication technologies is examined in Chapter 2, from early communication techniques in the form of primitive cave and wall paintings, to the development of moveable type and the sophisticated computerized systems that make possible the simultaneous publication of the same printed page throughout the world.

Chapter 3 investigates the principles of basic typography, from type families through a variety of typesetting systems. The creative design process is covered in Chapters 4 and 5. Chapter 4 highlights the steps in designing a project and focuses on the design process from a problem-solving perspective. The graphic design process is separated into distinct, manageable components, beginning with the definition of the problem. It then moves through the development of budget and schedules, to critique, design refinement, and then, final project review. Chapter 5 looks at the creative elements involved in graphic design. From the selection of proper column formats to the use of presentation graphic, design elements that are responsible for successful visuals are presented, with examples of what to do and not to do. Chapter 5 also deals on an in-depth basis with color as a design element. From the selection of colors to the differentiation between spot and process colors, the reader is given a broad perspective in the consideration of color as a creative design element.

Chapter 6 examines the fundamentals of computer graphics. The types of graphic design software programs that are available, along with the basic skills that are required to get the most out of these programs, are presented. After data have been digitized, what then? Chapter 6 looks at the basics of electronic page composi-



tion and layout. The digital revolution holds the promise of a future with only limited use of chemical photography based on traditional film processing. To the graphic designer and printing technician, the process of turning digital information into a finished page takes place primarily through the use of electronic page composition or layout programs. Readers will see how text, graphics, and design from a variety of sources come together on the computer screen in a format that is ready for the printing press. This material is covered in a generic manner, enabling the transfer of concepts from one computer program to another.

What are digital data? What makes digital data different from other types of information? These questions and others are answered in Chapter 7, which focuses on how original copy is digitized, manipulated, edited, and then output. The technology of scanning line, continuous-tone, and color copy is examined in relation to the scanning process. Also, because compact discs and digital versatile discs have assumed a major role in graphic and video production processes, both CD-ROM and DVD formats are examined in detail. The role and operational characteristics of digital presses and duplicators are examined in this chapter as well.

Chapter 8 examines traditional photographic imaging, with an emphasis on large-format graphic arts process cameras used in the production of line and halftone negatives, as well as combination page camera work. In addition to conventional chemical-based photographic techniques, direct-to-film procedures of computer output directly to an imagesetter, which is ready for plating, are covered as well.

Chapter 9 details stripping and platemaking procedures. Beginning with rough and finished sketches, our discussion moves through the assembly and combination of the basic elements of a mechanical layout to the procedures used to make presensitized photo-offset plates. Direct-to-plate technology involving the use of laser-sensitive plate material exposed in either platesetters, imagesetters, or directly on the printing press is also covered in this section.

Chapter 10 begins with tips on designing a job for the press room, including job specification sheets and related considerations that enable a production run to proceed on schedule and with a minimum of unexpected delays. An introduction to offset printing, examining the oil and water principle as the concept foundation for understanding the offset printing process, is a focal point of this section. The offset printing process, from press adjustments to hints for successful press operation are covered in detail. From traditional offset printing, our discussion moves to newer digital printing presses and the special considerations involved in digital reproduction techniques. Also, a variety of post-press finishing and binding techniques is presented.

Chapter 11 presents several culminating experiences for students: the production of newsletters, display advertising, catalogues and brochures. Using examples of student's work produced over a period of several years, the common elements of the design and production process that link these experiences are examined, along

with a series of alternative schemes that emphasize the wide variety of options available in both design and production techniques.

Chapter 12 presents the art and technique of successful Web page designing. This chapter uses Web design techniques based on software applications that utilize both easy-to-use interfaces as well as traditional HTML programming codes that maximize control over all aspects of page design and interaction.

Chapter 13 highlights the fundamentals of computer interactive multimedia design and production techniques. How do you set up branching options for a computer program? How are text, graphics, and animation produced and combined to make interactive presentations that literally jump off the screen? Techniques to accomplish these tricks, from the initial storyboarding of a project that forces the developer to organize and sequence all material, through the final road testing and production of the finished program, are covered in this chapter.

Finally, we wish to emphasize that we did not design this text as a comprehensive graphic arts textbook. The material in this book focuses first on the basic processes of creating a design and then on what is involved in reproducing it. Thus, this text should be viewed as an introduction to a complex and constantly changing field.

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