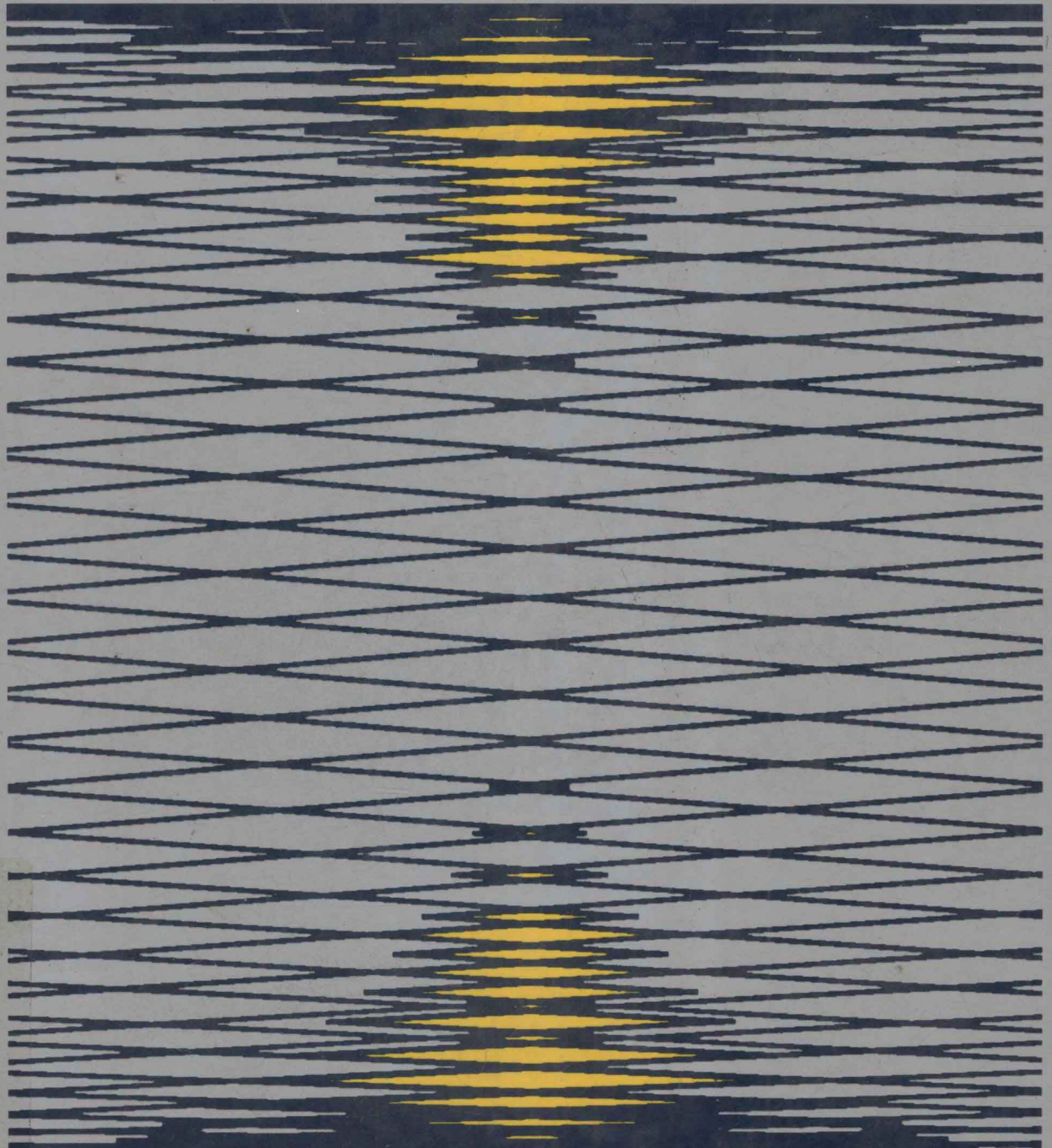


# BUSINESS **TELECOMMUNICATIONS**



Stanford H. Rowe II

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Stanford H. Rowe II  
Dow Corning Corporation



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## PREFACE

*Business Telecommunications* presents a complete introduction to the fast-paced world of telecommunications. Designed for a first course in this field, it covers all facets of telecommunications as it is used in business, including both data and voice communications—applications, technical details, and managerial aspects.

### Audience

*Business Telecommunications* is aimed at the individual who has no background in telecommunications other than that obtained in the course of daily living. Some knowledge of data processing is assumed—but no more than a student would gain by working with a personal computer or by taking an introductory data processing course.

Students at all levels from community colleges through graduate programs at universities will be able to learn about telecommunications from this book. In addition, it will be helpful to people in industry who need to understand more about telecommunications concepts and terminology. Its comprehensive coverage will make it a useful reference tool.

### Highlights

It has been said that telecommunications is one of those subjects about which you need to know everything before you can learn anything. *Business Telecommunications* reverses the cycle by presenting the material in a logical, building-block fashion. Words and terms are defined and explained when they are first used. Examples are used as a foundation and then expanded with more detail. By the end of the book, the student will have an excellent understanding of the subject.

*Business Telecommunications* takes an outside-in approach to its subject matter. Telecommunications applications, familiar to everyone, are discussed first as a way of easing the student into the material and explaining *what* the subject of telecommunications includes. The examples, references, and case studies all come from real-life business settings and illustrate the uses of telecommunications in business. The student will also learn *why* business feels that telecommunications is vitally important as well as how the regulatory environment affects the telecommunications industry.

With that background, the text leads the reader into the technical details of telecommunications. The technology is explained in an easy-to-understand, yet thorough manner. Current and emerging technologies are covered as well as traditional material. The student will gain an in-depth understanding of *how* telecommunications works.

Equipped with an understanding of the applications and technical details of telecommunications, the student is then introduced to the management of telecommunications. This material broadly covers all facets of telecommunications department management. The student will learn *why* it is necessary to manage telecommunications. The functions of the telecommunications department are examined in detail, and alternative ways of organizing the department are shown. One chapter is dedicated to the subject of network design, while another covers network operations. The book concludes with a quick look at several emerging applications of telecommunications that the student will be dealing with in the next few years.

*Business Telecommunications* contains many pedagogical features designed to assist the student:

- A set of objectives at the beginning of each chapter outlining what the student should learn;
- A running case study at the end of most chapters, which illustrates how the concepts and techniques of telecommunications have been applied by a real company;
- An extensive word list at the end of each chapter, serving as a check list of important terms, concepts, and ideas;
- Review questions for each chapter, which give the student an opportunity to test his or her knowledge of the material;
- Problems and Projects at the end of each chapter designed to involve the student in “thinking” and “doing.” The problems are challenging questions, which will lead the student beyond the text. In many cases, real-world situations are presented for his or her consideration. The projects often require the student to talk to telecommunications professionals and users.
- A comprehensive glossary of terms;
- A separate list of all of the acronyms used in the book;
- A list of references to standard telecommunications books as well as current articles on topical subjects.

For the instructor there is a comprehensive instructor’s guide that includes

- Suggestions for several ways to organize the course, depending on the desired emphasis and focus;
- Supplemental textual material that elaborates on some topics covered in the text;
- Transparency masters of the art in the book and the chapter outlines;
- Answers to the review questions in the text;
- Suggested solutions to the problems in the text;

- Hints for the presentation of material in the classroom;
- Test bank questions for examinations.

Much of the material in the book has been tested by the author and others in classroom settings.

### **Organization**

*Business Telecommunications* is divided into three sections. Part I deals with telecommunications applications and the environment.

- Chapter 1 introduces the subject matter and leads the students to realize that they may know more about telecommunications than they think, by virtue of daily experiences.
- Chapter 2 examines several familiar telecommunications applications in detail. This material serves as a reference set of applications for the student throughout the rest of the text.
- Chapter 3 discusses the environment in which telecommunications exists within a company, covering users' and managers' expectations of telecommunications.
- Chapter 4 presents the external environment. Deregulation and divestiture are covered, and the nature of the telecommunications industry is explored.

Part II delves into the technical details of telecommunications.

- Chapter 5 explains voice telecommunications with particular emphasis on the business setting.
- Chapter 6 discusses how data is coded for computing or telecommunications. Voice digitization is discussed, and the student begins to see how digitized voice and coded data can be transmitted together in an integrated network.
- Chapter 7 describes various types of communications terminals. This material, familiar to many students, serves the purpose of setting a common level of knowledge for the rest of Part II.
- Chapter 8 explains how data is transmitted, and how the terminal is interfaced to the communications circuit. The workings of modems are examined in detail.
- Chapter 9 describes communications circuits and networks. Error detection and correction are explained. Network topologies for both wide area and local area networks are also presented.
- Chapter 10 explains data link control protocols, the "rules of the road" for communications circuits. Both wide area and local area network protocols are emphasized.
- Chapter 11 discusses the way in which a circuit is connected to a computer. The functions of the front-end processor and communications software are covered.
- Chapter 12 discusses network architectures. The chapter puts all of the technical material into perspective by relating it to the ISO-OSI reference

model for open systems, IBM's SNA, and Digital Equipment Corporation's DNA. The need for network architectures and their advantages and disadvantages are also explained.

Part III deals with telecommunications management in the broadest sense.

- Chapter 13 focuses on the need for management, the functions of the telecommunications department, and management's line responsibilities.
- Chapter 14 examines the process of network design and implementation. The process is broken into phases, each of which is discussed in detail.
- Chapter 15 describes the management and operation of the network. Day-to-day operational procedures, as well as problem management, performance management, configuration control, and change management, are explained. The critical role of the communications technical support staff is also covered.
- Chapter 16 provides a glimpse of the future. Several applications of telecommunications that will be upon us in the near future are described. These are the types of applications that the students of today will be supporting and managing within just a few years.

## Acknowledgments

Accurate and up-to-date coverage of a fast-changing field such as telecommunications requires the input of many people. I want to thank the following individuals for their excellent suggestions and assistance during the preparation of this text: Tim Marcis, Bruce Estes, and Conrad Dalkowski of AT&T; Kristo Aleksov of Rolm; Howard Super and Larry Van Cleave of IBM; Jim Bradley of The Dow Chemical Company; Louie Lubahn, independent consultant; Janeen Beck, Leanne Newman, Tom Gulvas, Frank Aymer, Noel Vandewoestijne, Robert Chapman, Edward Steinhoff, and J. Kermit Campbell of Dow Corning Corporation.

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**Stanford H. Rowe II**



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