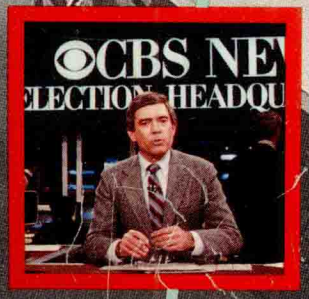
FOURTH EDITION

TELECOMMUNICATIONS

An Introduction to Electronic Media



LYNNE S. GROSS

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An Introduction to Electronic Media

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WCB Wm. C. Brown Publishers

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10 9 8 7 6 5 4 3 2 1

To my husband, Paul

PREFACE

PURPOSE

Telecommunications is one of the most potent forces in the world today. It influences society as a whole, and it influences every one of us as an individual. As each year passes, telecommunications grows in scope. The early pioneers of radio would never recognize today's vast array of electronic media—broadcast television, cable TV, direct broadcast satellite, and videocassettes, just to name a few. Neither would they recognize the structure that has evolved in such areas as regulation, advertising, and audience measurement. They would marvel that their early concepts of equipment have led to such developments as audiotape recorders, cameras, videotape recorders, digital effects generators, editors, computer graphics, and satellites. If they could see the quantity and variety of programming available today, they might not recognize that it all began with amateurs listening for radio signals on their "primitive" crystal sets.

All indications are that telecommunications will continue to change at a rapid pace. As it does, it will further affect society. All people, whether they be individuals working in the telecommunications field or individual members of society, have a right to become involved with media and have an obligation to understand why people need to interact with the media. Some knowledge of the background and structure of the industry is an essential basis for this understanding.

A major goal of this book is to provide just that kind of knowledge so that intelligent decisions about the role of telecommunications can be made both by those who are practitioners in the field and those who are members of the general society.

Organization of the Book

This is the fourth edition of this book, the first appearing in 1983, the second in 1986, and the third in 1989. A number of major changes have occurred in telecommunications since 1989, so corresponding changes needed to be made in this book.

Chapter 1 in Part 1 has been substantially rewritten and now includes several sections on ethics, in addition to the sections that deal with social significance. Both social impact and ethics are themes that are carried throughout the book and should be considered in conjunction with all the chapters. Because the international scene is becoming so important within the telecommunications field, this subject has been moved from the back of the book to Chapter 2. In this way, students should have a base of comparison against which to view American broadcasting.

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Part 2 deals with the various electronic media forms—Commercial Radio (Chapter 3), Commercial Television (Chapter 4), Public Broadcasting (Chapter 5), Cable Television and Competing Media (Chapter 6), and Personal and Organizational Telecommunications (Chapter 7). All of these chapters have been significantly updated and have incorporated material concerning the newer electronic media. For example, low-power TV and teletext are in Chapter 4 as forms of commercial television; MMDS, SMATV, and DBS are in Chapter 6; and Chapter 7 contains material on VCRs and video discs. In fact, Chapter 7 is reorganized to acknowledge the fast-growing and significant uses being made of telecommunications within corporations and educational institutions, and by individuals armed with their camcorders.

Because financial and business considerations are such an important part of the electronic media these days, this material has been moved forward to Part 3. A brand-new chapter on business practices starts off this section, which includes advice to students concerning employment. Updated chapters on advertising and audience measurement follow.

Part 4 deals with programming. Program types have remained essentially the same as they were three years ago, but programming practices have changed greatly.

In Part 5, Chapter 14 on production equipment has been almost totally rewritten to take into account new developments in equipment. Chapter 15, dealing with distribution, now contains a separate section dealing with high definition television.

The final part of the book, Part 6, covers regulation. The two chapters (Chapter 16—Regulatory Bodies and Chapter 17—Laws and Regulations) have been somewhat reorganized, and new cases and regulatory philosophies have been included.

All the chapters should lead the reader to assess the strengths and weaknesses of the particular subject being discussed. Information relating to future directions telecommunications may possibly take is also woven throughout the appropriate chapters.

Special Features

Each part of the book begins with an overall statement that relates the chapters to one another. Each chapter begins with a pertinent quote and a short introduction.

Each chapter conclusion summarizes major points but does so in an organizational manner slightly different from that given within the chapter. For example, if the chapter is ordered chronologically, the conclusion may be organized in a topical manner. This should help the reader form a gestalt of the material presented.

Further aids in understanding the material are the thought questions at the end of each chapter. These questions do not have "correct" answers, but rather are intended to lead the reader to form his or her own judgments. Discussions centering around these questions will indicate that varying opinions surround telecommunications issues.

Chapters are broken down into major divisions, and marginal notes appear within each division. Each marginal note highlights the main subject being discussed in the adjacent paragraph or paragraphs. Taken together, these notes serve as review points for the reader. Throughout the text, important words are boldfaced. These, too, should aid learning. Some of the boldfaced words are defined in the glossary, while others are names of important people or organizations.

The chapters may be read in any sequence; however, some of the terms that are defined early in the book may be unfamiliar to people who read later chapters first. The glossary can help overcome this problem. It includes important technical terms that the reader may want to review from time to time, as well as terms that are not necessary to an understanding of the text but that may be of interest to the reader.

Chapter notes, which appear at the end of the book, are extensive and provide many sources for further study of particular subjects.

The photographs and charts that appear throughout the book supplement the textual information.

SUPPLEMENTARY MATERIALS

Student Study Guide

A student study guide has been prepared to help students learn the material thoroughly. The chapters in the study guide correspond to the chapters in the text itself. Each chapter in the study guide is divided into six sections—overview, key terms and concepts, study questions, sample test questions, research sources, and answers to sample test questions. This material can be examined before, during, or after the reading of the text material itself.

Instructor's Manual

The instructor's manual available with *Telecommunications* offers two sample course outlines that can be adapted to semesters or quarters, as well as learning objectives, suggested lecture topics/activities, films and tapes, overheads, test questions, and a bibliography for each text chapter.

TestPak
WCB TestPak is a computerized system that enables you to make up customized exams quickly and easily. Test questions can be found in the Test Item File, which is printed in your instructor's manual or as a separate packet. For each exam you may select up to 250 questions from the file and either print the test yourself or have wcb print it.

Classroom Tape Material
In order to aid in the teaching of the class, wcb has collected a number of videotapes to be used in conjunction with this class. For more information about these tapes, contact your sales representative.

Overhead Transparencies
Also, in order to aid the teaching of the class, a number of overhead transparencies have been prepared. Many of these are charts that contain figures likely to be outdated quickly. These will be updated every year, so instructors can always have the latest information to present to the students. Qualified adopters can obtain these overheads by contacting Wm. C. Brown sales representatives.

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Lynne Schafer Gross

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Introduction

Telecommunications is a powerful force in society. Radio and television permeate our lives, yet many generations of people existed without electronic media. The pervasive influence has occurred in a short space of time, but its intensity compensates for its youth.

In foreign countries many of the forms of electronic media have existed for an even shorter period of time. But they have grown to a point where worldwide media interaction promises to be a major force and major issue of the coming decades.

PART 1

Social and Ethical Implications of the Electronic Media

CHAPTER 1

Introduction

The influence that telecommunications exerts upon our society is obviously extensive. The mere ability to communicate instantaneously affects the process of communication. Beyond this, the permeation of opinions, emotions, and even fads can often be attributed to various elements of the media.

The pervasiveness of radio and television, whether applauded or condemned, cannot be denied. The influence extends from the individual through the social structure, the economy, technology, and politics. All of this places a responsibility on individuals within the telecommunications field to act in an ethical manner that does not betray the confidence placed in them.

Television is less a means of communication (the imparting or interchange of thoughts, opinions, and information by speech, writing, or signs) than it is a form of communion (act of sharing or holding in common; participation, association; fellowship).

Richard Schickel
The Urban Review

A Rationale for Study

Everyone has an opinion about radio or television fare, and everyone can exhibit a certain amount of expertise about a force that is seen and heard on a daily basis.

career information

Then why study this field? Some of the answers to this question are obvious. Anyone who is aiming toward a career in this area will profit from an intimate knowledge of the history and inner workings of the industry. Radio and television are highly competitive fields, and those armed with knowledge have a greater chance for career survival than those who are naive about the inner workings and interrelationships of networks, stations, cable TV facilities, advertisers, unions, program suppliers, telephone companies, the government, and a host of other organizations that affect the actions and programming of the industry.

understanding of influence

On a broader scope, individuals owe it to themselves to understand the messages, tools, and communication facilities that belong to our society because they are so crucial in shaping our lives. Rare is the individual who has not been emotionally touched or repulsed by a scene on TV. Rare, too, is the individual who has never formed, reinforced, or changed an opinion on the basis of a presentation seen or heard on one of the electronic media. A knowledge of the communications industry and its related areas can lead to a greater understanding of how this force can influence and affect both individual lives and the structure of society as a whole.

In addition, telecommunications is a fast-paced, fascinating industry worthy of study in its own right. It is associated with glamour and excitement (and power and greed), both on-screen and off. Although, in reality, the day-to-day workings of the industry can be as mundane as any other field, the fact that it is a popular art that includes the rich and famous makes it of special

interesting subject

interest. The ramifications of the power that the electronic media exert over society is most deserving of study.

The Broad Context

Studying this field used to be fairly simple. There were two media—radio and

broadcasting

television, and together they were called **broadcasting.** As time progressed, broadcasting was divided into two categories—commercial and public (originally called educational). These two coexisted fairly harmoniously because public broadcasting was small and not really a threat to its commercial kin. In fact, it often relieved commercial broadcasting of its more onerous public service requirements, because the commercial broadcasters could point out that public broadcasting served that interest.

Then in the mid-1970s a number of other media came to the fore to challenge radio and TV, creating an alphabet soup that included CATV, VCR, DBS, MMDS, SMATV, and LPTV. The word *broadcasting* no longer seemed to apply because that word implied a wide dissemination of information through the airwaves. Many of these other media were sending information through wires, and cable TV was even going around touting its **narrowcasting** because

its programs were intended for specific audience members. For a while these new forms were referred to as new media or new technologies, so people studied broadcasting and the new media. Also, during the 1970s many companies began using television, particularly for training. This was referred to as *industrial TV,* but it was not studied to any great degree.

new technologies and industrial TV

In the 1980s when the new media weren't so new anymore, they began being referred to as developing technologies, but some of them didn't develop very well. In fact, a number of them just plain died. Generally, the term **electronic media** was used to describe broadcasting and the newer competitive forces, but sometimes the word **telecommunications** was used to label the entire group, including industrial TV, which, by now, had changed its name to *corporate TV.*

electronic media

Now in the 1990s, the field of study may be broadening even more. Video gear has been developed to the point where just about anyone can afford it and can use it to create quality pictures and sound. This democratization of video seems to be leading to a new field called *personal video.* In addition, the telephone and computer have teamed up and may be on the verge of creating a new round in the information evolution. In a way, this brings broadcasting full circle. Radio can be seen to have its antecedents in the telephone because, at one point, the telephone was seen as a mass medium and the radio as an individual, private medium. In 1877, a song called "The Wondrous Telephone" contained the following lyrics: "You stay at home and listen to the lecture in the hall, Or hear the strains of music from a fashionable ball!"[1] The original idea for the telephone was that it would deliver words and music to large groups of people. When radio was first developed, many people tried to invent ways to make the signals private so that two people could have their own confidential conversation.

personal video and the telephone

Of course, over the years the two media switched roles—telephones being the private medium and radio becoming the mass medium. The two also went their separate ways academically and socially. Rarely were they studied in the same curriculum, and rarely did people trained for broadcasting obtain jobs in the telephone industry. The social, economic, and political issues affecting each were quite dissimilar.

Then along came the computer and a device called a modem. When this modem was attached between a computer and a telephone, data generated by the computer could be sent over phone wires to another computer. Suddenly information sent through the telephone was appearing on what looked like (or were) television screens. Some of the information being transmitted over this computer-telephone system was not private, but was intended for anyone in the population who wanted it or was willing to pay for it, including those in corporations. It included news, stock market quotes, sports, and other information traditionally provided by radio and TV, as well as newspapers and magazines.

the computer

The word *telecommunications* was somewhat taken over by the telephone industry to encompass both the old telephone services and all the new data transmission and other fancy services the computer enabled the telephone to undertake.

telecommunications

Now the telephone, computer, radio and TV broadcasting, cablecasting, personal video, corporate video (now sometimes called *organizational video*), and the alphabet soup of newer technologies seem to be merging into some form of information supplier as yet undetermined. The most common word used to encompass all of this is *telecommunications,* but the word or even the concept could change drastically in the near future.

The words *telecommunications, electronic media,* and *broadcasting* are used somewhat interchangeably in this book because, at the time of writing, the general use of all three words is somewhat ambiguous. The book will concentrate, however, on commercial radio, commercial television, public radio, public television, cable television and its competitors, and organizational and personal video. It will also deal with the telephone and computer, but mainly as they relate to and are becoming merged with the media taught in the traditional radio and TV curriculum.

Statistics of Pervasiveness and Change

sending and receiving

This force, by whatever name—telecommunications, electronic media, or broadcasting—is very pervasive in our society. On the sending end, there are about 10,700 radio stations and approximately 1,400 TV stations in the country. In addition, there are almost 11,000 cable TV systems. (See plate 1 for more detail.) On the receiving end, 99 percent of households have radios, 98 percent have TVs, 93 percent have telephones, 59 percent subscribe to cable TV, and 73 percent own videocassette recorders.[2] (See plate 2 for more detail.)

uses

More important, people don't just own radios, TVs, and VCRs; they use them. The average household has TV on about seven hours a day, with the average person watching about four hours a day. The average person also tunes in radio about three hours a day.[3] (See plates 3 through 7 for more detail.)

Because of the fast-paced nature of the electronic media business, many characteristics of the industry are subject to rapid change. This can be seen by what happened to the TV industry during the decade of the 1980s. (See plate 8.)

network changes

The beginning of the 1980s saw a television field dominated by three networks. By the end of the decade, these networks had competition from many sides, primarily cable TV, independent TV stations, and VCRs. The average share of network prime-time viewership went from 85 percent in 1980 to 67 percent in 1989. Not surprisingly, the average number of channels available per household rose from 8 to 28, cable TV penetration increased 37 percent, and almost three-quarters of American households equipped themselves with a VCR during the 1980s.[4]

mass to fractionalization

What all this meant was that TV was going from a mass appeal medium, where most people in the country watched the same programming at the same relative time, to a more fractionalized medium that was appealing to smaller groups of consumers. No longer did the three network programming chiefs call the shots as to what the people would watch and when they would watch

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