JOHN R. BITTNER

BROADCASTING
An Introduction

1880 1885 1890 1895 1900 1905

1831
Michael Faraday studies electromagnetism.

1876
Alexander Graham Bell publically demonstrates the telephone.

1873
James Clerk-Maxwell advances his earlier theories on electromagnetic energy.

1886-1889
Henrich Hertz discovers and experiments with electromagnetic waves.

1884
Paul Nipkow works with the scanning disc television.

1885
American Telephone and Telegraph Company (A.T.&T.) is formed.

1892
Nathan B. Stubblefield transmits voice using the induction method.

1894-1895
Marconi conducts early experiments in Italy.

1896
Marconi files for patent.

1897
Marconi forms the Marconi Wireless Telegraph Company, Limited, in England.

1899
Marconi conducts experiments for British postal officials.

1897
Marconi receives British patent #12059 for wireless.

1901
Marconi receives signals from England at his station at Signal Hill, Newfoundland.

1903
Berlin is the scene of a conference called to discuss Marconi monopoly of marine communication.

1901
Marconi patents selective tuning device.

1904-1905
J. Ambrose Fleming patents the Fleming "valve" in the United States and England.

1902
Marconi opens transatlantic wireless service from Canada.

1906
Lee deForest introduces the three-element triode tube called the Audion.

1906
H.C. Dunwoody invents crystal radio receiver.

1906
Twenty-seven nations adopt regulations at the International Radiotelegraph Conference.

1906
Reginald Fessenden broadcasts Christmas "voice" message.

1906
Greenleaf W. Pickard perfects silicone crystal detector.

1906
David Sarnoff is hired by the American Marconi Company.

1880 1885 1890 1895 1900 1905

1910 1915 1920 1925 1930 1935

1915
David Sarnoff writes famous memo on the future of wireless.

1914
Amateur radio operators form the American Radio Relay League (A.R.R.L.).

1909
Charles David Herrold's station broadcasts from San Jose.

1912
Wireless gains publicity by aiding rescue efforts from the *Titanic*.

1912
Radio Act of 1912.

1910
Wireless Ship Act of 1910.

1914–1918
Wireless used extensively in World War I.

1919
Owen T. Young negotiates the formation of RCA.

1917
Alexanderson's alternator takes on increased importance for international communication.

1923
V.K. Zworykin patents the iconoscope pickup tube for television.

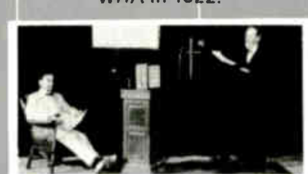
1922–1925
National Radio Conferences. (Four held before new legislation)

1921
Philo Farnsworth outlines to his science teacher the concept of electronic television.

1923
Case of *Hoover v. Intercity Radio.*

1926
RCA forms subsidiary NBC to operate Red and Blue networks.

1919
9XM at the University of Wisconsin, Madison, signs on the air. Becomes WHA in 1922.



1920
WWJ in Detroit begins intermittent broadcasting schedules in August.

1920
KDKA in Pittsburgh begins regular programming in November.

1922–1923
National Association of Broadcasters (NAB) is formed.

1922
Toll broadcasting begins at WEAF.

1927–1934
Radio Act of 1927 withstands challenges in court.

1926
Case of *U.S. v. Zenith Radio Corp.*

1927
Radio Act of 1927 is passed. Forms five-member Federal Radio Commission (FRC).

1933
President Roosevelt uses radio for "fireside chats" with the public.

1933
Edwin Armstrong demonstrates FM broadcasting for RCA.

1931
Zworykin and RCA officials visit Farnsworth labs in California. RCA later enters royalty agreement with Farnsworth.

1932
Closed Circuit ETV begins at State University of Iowa.

1932
Shuler case is decided.

1930
Philo Farnsworth applies for permission to experiment with 300-line TV system.

1934
Communications Act of 1934 is passed. Forms seven-member Federal Communications Commission (FCC). Independent regulatory body.

1934
Mutual network begins as four-station cooperative.

1928
CBS begins when interests are purchased by Wm. S. Paley and Congress Cigar Company.

1930
Zworykin visits Farnsworth labs in California to examine 300-line TV scanning system.

1929
First NAB "Code of Ethics" is passed.

1929
First broadcast rating by Crosley Radio Company.

1933
Press-Radio War ends with Biltmore agreement.

1931
KFKB (*Brinkley*) case is decided.

1910 1915 1920 1925 1930 1935

BROADCASTING

an introduction

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for John and Donald

contents

PART 1 HISTORY AND DEVELOPMENT

PART 2 BASIC TECHNOLOGY

PART 3 SYSTEMS

PART 4 REGULATORY CONTROL

preface and acknowledgments

This book is designed for use in single semester or term introductory broadcasting courses. It is directed toward college students who aspire to be either responsible consumers of broadcasting in society or practicing professionals in broadcasting or related fields. It also is for students who enroll in a single broadcasting course for a greater appreciation of the broadcast media or for students who take additional courses for a greater measure of expertise in the discipline.

The text goes beyond names and dates by integrating broadcasting into the wider realm of telecommunication and human interaction. The reader will find, along with chapters on the historical and contemporary aspects of radio and television, separate chapters highlighting such subjects as the broadcast audience and effects, cable, uses of satellites and microwaves, television in business and industry, educational and public broadcasting, ratings, regulation and regulatory issues, research in broadcasting, and advertising and economics.

The text treats the historical basis of broadcasting, but it is not a history book. Although there are chapters that deal with the beginning of the wireless and the development of the industry, much of the book is based on the contemporary industry.

At the beginning of each chapter is a special "focus" to create a mental receptacle in which to plug in the major points of the following chapter. Each chapter concludes with a bibliography presented as a "spotlight on further learning."

The Appendix has a special guide to help the student use library resources to learn more about broadcasting and to prepare assigned papers and reports.

A comprehensive instructor's manual accompanies the text.

Naturally, in any book the author's own experiences are part of the content and organization of the work. Since my career has been in both college teaching and the broadcasting industry, the text is a bridge joining elements of both academia and the industry.

As author, I am deeply indebted to the students in my courses at DePauw University, and equally to the staff I had when serving as general manager of a broadcasting station and, prior to that, as a radio news director and television journalist. The following acknowledgments can only begin to express my gratitude to those who have helped during the four years in which this book has been in preparation.

Chris Sterling, Robert Burdman, William Fraser, and Jay Wright provided valuable assistance at various stages of the book's development. Many other individuals and colleagues gave suggestions and encouragement. Barbara Christenberry, Eric Bernsee, G. Gail Crotts, Barbara Moran, Larry Barker, Robert Kibler, Brian Walker, George Foulkes, Jean Wachter, Frida Schubert, Richard Shaheen, Larry Taylor, and Ralph Taylor all deserve special thanks. In addition, Mike Warner, Maureen Lathers, John Busch, Judy Mortell, Bill Ketter, John Payne, Roy Mehlman, Julie Zellers, Hal Youart, Thom Brown, Pat Nugent, Dan Bronson, Barbara Moore, Greg Rice, and Walt Stewart all should be mentioned as well as Bruce Kennan, Colette Conboy, Karen Thompson, Denise Moderack and Shelia Whiting.

Staffs of ABC, CBS, NBC, and PBS all helped, as did personnel in government agencies, professional associations including NAB and NCTA, and numerous stations including WAZY, KRON, WNET, and others.

Few authors could ask for more support than I received from the entire library staff of DePauw University. Their professional courtesy, tireless help, and cooperative attitude are a most valuable resource. Few authors could have a finer staff than Jim Martindale, Cathie Bean, Catherine Bean, Patricia Renn-Scanlan, Rea Brown, Celia Lemmink, Dave Horn, Dan Smith, and Judy Meyer.

A special acknowledgment is made to Larry L. Hardesty, reference librarian at DePauw University, for his efforts in developing the library guide found in this book.

Pamela Loy and Kent Mecum provided helpful translations of foreign-language documents and sources. Enjoying an office next to Beverly Whitaker-Long kept a professional spirit alive.

Discussions with John Jakes during his many visits to DePauw provided valuable writing discipline and contagious enthusiasm.

Rea Zeiner, Mildred Hancock, Linda Rowe, Barbara Boyll, and Linette Finstad helped type the manuscript. Elinor Zeigleman and Midge Cook kept an office running smoothly.

And no one deserves more credit than Denise.

illustrations to help you learn

Chapter 4: Radio Waves and the Spectrum

Chapter 5: Broadcasting's Use of Microwaves and Satellites

Chapter 6: Cable

Chapter 7: Networks and Syndication

Chapter 8: Educational and Public Broadcasting

Chapter 9: Television in Business and Industry

Chapter 10: International Broadcasting

Chapter 18: The Research Process

Using the Library to Learn About Broadcasting

1

broadcasting as mass communication

FOCUS After completing this chapter we should be able to

Understand the meaning of the terms broadcast and communicate.

Explain the differences among the intrapersonal, interpersonal, and mass communication processes.

Diagram the components of the basic model of communication and mass communication.

Explain how the definition of mass communication is changing.

Define the terms gatekeeper, delayed feedback, and noise.

Understand the social context of mass communication.

Discuss broadcasting as a form of mass communication.

The young boy listened with fascination as his father spun a tale of yesteryear. He could not imagine the almost primitive society of the 1980s in comparison to his world at the turn of the twenty-first century. Stories of a mere four major television networks, watching television with only a dozen channels from which to choose, and tens of radio stations crowding their frequencies together on a tiny portion of the dial just did not seem possible. Why, now there were hundreds of television channels from which to choose, and they were programmed like radio in the 1980s. Some television stations broadcast only sports or news, others only old-time movies or symphonies, and still others broadcast only political caucuses, or government meetings, or anything else you could ever want to watch.

Radio was now an even more specialized medium. Almost everyone listened to FM for music, and the AM band was mostly for talk and informational programming. Virtually every station had quadraphonic sound—the boy could not imagine listening to radio through a single speaker on the kitchen table. His house, like others, had a media room in which four huge speakers in each corner made a recording of a symphony orchestra sound like a live concert. He did not just listen to classical music, he experienced what it was like to be sitting in the middle of the orchestra.

Every city had at least two and sometimes three television networks with satellite connection feeding programs around the world. The older man reminisced about the excitement of watching the new networks pop onto the giant screen. Networks from Chicago, Montreal, Mexico City, Dallas, and Tokyo all came into the living room over a cable system that could carry as many as a thousand channels. Even now that system was still in its infancy. The youngster looked forward to the day when he would be licensed to program his own amateur television station and broadcast to other amateur operators around the world.

What really amazed him was the realization that the concept of electronic communication was only slightly more than one hundred years old—a minute speck on the yardstick of time. The electronic world he lived in had been molded first by the discovery of electricity, then electromagnetic energy, next wireless transmission, and then computers storing and processing new information with lightning speed. All of these discoveries had shaped a world of electronic wizardry capable of communicating with millions of people the world over. Even now it was testing the new frontiers of communication in the stellular systems of the universe.

No longer was broadcasting simply the spark-gap experiments of 1887 when German physicist Heinrich Rudolph Hertz discovered the presence of electromagnetic waves. Nor was it the crude device that American farmer Nathan B. Stubblefield used in 1892 to send wireless messages from a Kentucky shack to an apple orchard a short distance away.[1] Guglielmo Marconi made history a few years later with his "wireless," or "radio" as it later became known, by broadcasting the first transatlantic signal code message on December 12, 1901 from Signal Hill, Newfoundland, Canada.

From that point on, the wireless transmission of messages became a passion of inventors, amateur experimenters, and large companies. As with any limited resource which the public clamors too ardently to possess, government control was inevitable. Political pressures, the need for security in time of war, and a federal directive to serve in the public's "interest, convenience, and necessity," all contributed to the development of broadcasting. These forces helped, harnessed, and harrassed. But the medium survived and prospered.

The boy who now sits listening to his father's reminiscences could have felt the same awe thirty years earlier—and thirty years earlier than that. Because broadcasting has gone through such rapid changes, there has never been a decade since its birth that has not fostered a mushroom of new technology. Messages that were once carried on a spark now play leapfrog with satellites. And a world that once gawked with amusement now looks in amazement.

what is broadcasting?

Before beginning this book, let's first determine what the term *broadcast* (Figure 1–1) means. In its most basic sense, it can mean "scattered over a wide area," or "in a scattered manner; far and wide,"[2] along with those statements, the dictionary also includes such definitions as "to make known over a wide area: broadcast rumors." Certainly a disgruntled and defeated politician might agree with that definition. Or consider the definition "to participate in a radio or television program." The guest home economist on an afternoon radio program for consumers would agree with that definition. The farmer in the 1800s who never had heard of radio or television would have agreed with the dictionary's definition that broadcast means "to sow [seed] over a wide area, especially by hand."

Consulting a thesaurus, we find that words with similar meanings to "broadcast" include "disperse, generalize, let fall, cultivate, communicate,

broad·cast (brôd'kăst', -käst') *v.* **-cast** or **-casted, -casting, -casts.** —*tr.* 1. To transmit (a program) by radio or television. 2. To make known over a wide area: *broadcast rumors.* 3. To sow (seed) over a wide area, especially by hand. —*intr.* 1. To transmit a radio or television program. 2. To participate in a radio or television program. —*n.* 1. Transmission of a radio or television program or signal. 2. A radio or television program, or the duration of such a program. 3. The act of scattering seed. —*adj.* 1. Of or pertaining to transmission by radio or television. 2. Scattered over a wide area. —*adv.* In a scattered manner; far and wide. —**broad'cast'er** *n.*

Figure 1–1 (© 1969, 1970, 1971, 1973, 1975, 1976, Houghton Mifflin Company. Reprinted by permission from *The American Heritage Dictionary of the English Language.*)

publish, telecommunication, oration, and waste."[3] We would not have to travel far to encounter people who would agree with all of those meanings. The ad executive responsible for selling a client's product would "disperse" knowledge through broadcasting commercials. The supporter of noncommercial public broadcasting would argue that quality programming "cultivates" an interest in culture and the arts (Figure 1–2). The broadcast journalist who was subpoenaed before a grand jury and asked to divulge the source of her latest investigative report would argue that under the First Amendment to the U.S. Constitution, broadcast means the same as to "publish," and her rights to protect the confidentiality of news sources are the same as those of newspaper reporters. The word broadcast to the corporate executive might be more closely associated with "telecommunication." As two people sit in the corporate boardroom, their picture is reproduced on television monitors one continent away. There, other corporate executives talk back to the boardroom executives via a two-way television system. For the person highly critical of television programming, the term "waste" might be more appropriate. The term "vast wasteland," coined by a former chairman of the Federal Communications Commission, Newton Minow, has become a favorite term of critics of commercial television.[4]

In the following chapters, we shall journey into the exciting worlds of broadcasting, experiment with innovative technology, predict the future, and reflect upon the past. Such terms as satellites, community antenna television (CATV), Westar®, educational television (ETV), the Communications Act, business and industrial television, AM stereo, and many more will become part of your vocabulary. You will read about Captain Kirk, Barbara Walters, Hopalong Cassidy, Rhoda, and other figures. You will also discover the economic factors which are part of any broadcasting system, the political and social controls which check and balance the system, and the audience which uses it.

Figure 1–2 Typical of quality programming cultivating an interest in culture and the arts is the Public Broadcasting Service's "Dance in America" series. Pictured is a scene from "Adorations" produced by WNET/13 New York. We shall learn more about public broadcasting in chapter 8. (WNET/13)

First we need to examine where broadcasting fits into the total communicative process. To do that, we shall explore the different types of communication.

understanding communication

What exactly does it mean to *communicate?* (Figure 1–3). To the physiologist concerned with the processes of life, it has one meaning. To a psychologist specializing in counseling, it has another. To the anthropologist studying different cultures, it has still another meaning. If we return to our dictionary, we will also find different definitions under the listing "communicate," such as "to make known, impart, transmit."[5]

Still other definitions include that of Stewart Tubbs and Sylvia Moss in their book *Human Communication*, in which they define communication as

com·mu·ni·cate (kə-myōō'nə-kāt') *v.* **-cated, -cating, -cates.** —*tr.* 1. To make known; impart: *communicate information.* 2. To transmit (a disease, for example). —*intr.* 1. To have an interchange, as of thoughts or ideas. 2. To receive Communion. 3. To be connected or form a connecting passage. [Latin *commūnicāre,* "to make common," make known, from *commūnis,* COMMON.] —**com·mu'ni·ca'tor** (-kā'tər) *n.*

Figure 1–3 (© 1969, 1970, 1971, 1973, 1975, 1976, Houghton Mifflin Company. Reprinted by permission from *The American Heritage Dictionary of the English Language.*)

"the process of creating meaning."[6] Kenneth Andersen in his book *Introduction to Communication Theory and Practice* defines communication as a "dynamic process in which man consciously or unconsciously affects the cognitions of another through materials or agencies used in symbolic ways."[7] Wilbur Schramm in his *The Process and Effects of Mass Communication* stresses the importance of viewing communication as "an act of sharing, rather than something someone does to someone else."[8] To understand these definitions better, let's examine three types of communication: intrapersonal, interpersonal, and mass.

intrapersonal communication

The physiologist may think of communication as *intrapersonal communication*, communication within ourselves. In human physiology, our senses, our nervous system, and our brain become the main components of the communicative process. For example, if we are watching an instructional television program about basic mathematics, our eyes and ears respond to what is on the screen. These two senses of sight and hearing send electrochemical impulses through the nervous system to the brain. After receiving the impulses, the brain then feeds back other impulses to our motor nerves, nerves which influence movement and which may cause us to pick up a pencil and paper and work the math problem. In our example, different components of the communication process come into play: the *sender* (eyes and ears), *message* (electrochemical impulses), *medium* (nervous system), *receiver* (brain), and *feedback* (electrochemical impulses). Another factor, *noise,* can interfere with the communication process. Your head may ache to the point at which you cannot think. A sickness or injury may damage your nervous system, either interrupting the passage of electrochemical impulses or interfering with your ability to respond to commands given your motor nerves by your brain. All of these are examples of one type of noise, physical noise.

To understand the process better, let's look at a communication model (Figure 1–4). In a sense, a communication model "freezes" the communication process so we may more leisurely examine its parts. Note where each of the components in the process of intrapersonal communication fits into the model: sender, message, medium (sometimes called channel), receiver, feedback, and noise. We will continue to use this basic communication model as we discuss how broadcasting fits into the communication process.

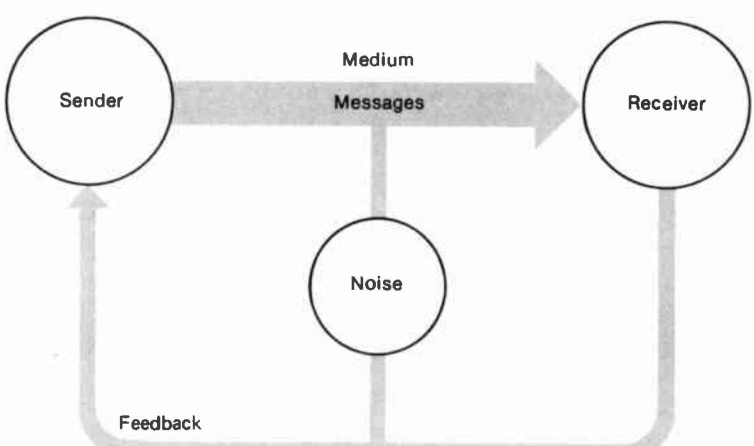
Remember, for human communication of any kind to occur, intrapersonal communication must be present. In examining our dictionary definition of "communicate," we see that someone must first *think* about information before it can be "made known" or "imparted." Before "an interchange" of "thoughts or ideas" can take place between two people, each person must first employ the process of intrapersonal communication in order to react to the other's message. In Kenneth Andersen's definition, intrapersonal communication must take place before "man consciously or unconsciously affects the cognitions of another. . . ."

interpersonal communication

Interpersonal communication is communication in a face-to-face situation between at least two people, often many more, such as a group discussion or a speech to a crowd. In interpersonal communication, the same components of communication apply as those to intrapersonal communication. Here, however, the components are different.

Using our example, imagine that instead of watching the instructional

Figure 1–4 Basic model of communication.



television program about mathematics, you are attending the instructor's class in person. Now the instructor becomes the sender of communication; the messages become the words spoken by the instructor; the medium is the human voice; and you are the receiver of communication. If you do not understand something the instructor is saying, you can immediately raise your hand to ask a question. Your hand being raised is a form of feedback to the instructor.

Noise can also be present. Physical noise may occur if the lights go out and you cannot see the instructor. Or a student next to you may drop a pile of books, distracting your attention. In interpersonal communication, a second type of noise can be present—*semantic* noise. Semantic noise can occur when the instructor uses a word or phrase with many different meanings, confusing you as to which meaning she wants to convey.

Using our example of the lecture, we can begin to see the reason for Wilbur Schramm's emphasis on communication as a "sharing" process. If constructive communication is to take place, you must share certain things with the instructor. First, you must understand the language, both written and oral. Second, you must know something about the subject of mathematics or else the lecture would have little value to you, and you could not begin to work the problems. You may also respect the instructor's ability to teach, perceiving her as having a genuine interest in mathematics whether or not you are able to comprehend the subject. If you have proved yourself a good student, the instructor will probably consider you as being interested in the subject, respect your ability to learn, and perceive you as having a genuine interest in learning. Kenneth Burke stresses this concept of sharing as an "identification" not only between people's experiences but between language as well. Burke is interpreted as seeing people with "common interests because of their experiences as members of groups. But if they are to function as grounds for identification, these interests must be recognized and announced symbolically for unification of attitude or action to occur."[9]

Communication researchers have used behavioral research methods to examine this concept in more detail. It has been examined by such well-known social scientists as Paul Lazarsfeld and Robert Merton. The technical term used to describe the concept is *homophily*. Homophily can best be understood as overlap. Or, as James McCroskey and Lawrence Wheeless state, "To the extent that the attitudes, beliefs, experiences, education, background, culture, and so forth, of the source (sender) and the receiver overlap, they are more likely to attempt communication with each other, and equally as important, they are more likely to be effective in their communication attempts."[10] This concept of "sharing," "interaction," and "homophily" are important to remember, because they center on how we react to all communication.

mass communication

Now that we have a basic understanding of the processes of intrapersonal and interpersonal communication, we need to understand the process of mass communication and, specifically, where broadcasting fits into the process. Mass communication is different from intrapersonal and interpersonal communication in three ways.

Defining Mass

First~~, as the word *mass*~~ denotes, mass communication has the ability to reach a ~~large number of people through~~ a mass medium. The number of people who could attend the lecture on mathematics was determined by the size of the classroom. However, if it were televised, it could be made available to many thousands, perhaps millions of people.

The Medium

To make the lecture available to those thousands of people, it is necessary to alter our concept of medium. N~~o longer is it just the~~ human voice or the nervous system; ~~we add the mass medium of~~ television. We could just as easily add the medium of radio, books, or even newspapers, depending upon the applicability of the medium to our task. It may be somewhat difficult, although certainly not impossible, to teach our mathematics section by radio. We may even produce a series of articles for the newspaper. If we want to teach music appreciation, radio might be just as effective as television and considerably cheaper. On the other hand, if we want to teach surgical techniques, television would be far superior. Nonetheless, some mass medium would be necessary to reach the audience beyond the limitation of interpersonal communication. For our purposes, we will therefore define ~~*mass communication as messages directed toward a group of people by a mass medium.*~~

Altering the Definition of Mass

At first glance, it may seem as if the appropriate wording of our definition should be messages directed toward a *mass audience,* or large number of people, by a mass medium. Although this definition has merit and in some ways is correct, its traditional approach has been altered by new applications of mass media, such as the use of radio and television for internal corporate communication. Television now finds itself connecting the boards of directors of two corporations, located on different sides of the continent or even oceans away, for executive conferences. Meetings with participants scattered hundreds of miles apart take place regularly in this way. Similarly, television is used to disseminate messages to rather small audiences but ones which cannot communicate face-to-face or on an interpersonal basis. A state police commander may give a training lecture at his desk in front of a television camera. The videotape of his lecture is then played back at regional command centers throughout the state at which a group of ten or twelve troopers view the lecture. In each case the audience is relatively small, far from what we would normally consider a mass audience. It is in this way the definition of mass is changing. Technology of "mass" communication is being used to reach smaller, more specialized audiences.

the gatekeeper and delayed feedback

Besides the presence of a mass medium, two other factors have traditionally differentiated mass communication from intrapersonal and interpersonal communication—the presence of a gatekeeper and delayed feedback. With these additional concepts, our basic model of communication has been altered to represent the process of mass communication (Figure 1–5).

The term gatekeeper was first applied to the study of communication by Austrian psychologist Kurt Lewin, who defined gatekeeper as "a person or groups of persons governing the travels of news items in the communication channel."[11] Today, the term gatekeeper applies to not only groups of persons but to entire institutions. Within these institutions are both people and technology, all interacting to "govern the travels" of information between senders and receivers. That information is much more than news, as Lewin suggested. It may be strictly informative, such as an evening television news program compiled and produced by hundreds of reporters, camerapersons, editors, engineers, specialists in audio and video recording, researchers, writers, and many others. Or the message may be entertaining and involve producers, directors, costumers, scene designers, musicians, and countless more. The gatekeeper now becomes not only a person or group of persons, but people and technology through which the message must pass and be acted upon, sometimes altering it, before it reaches the consuming public.

Functions of the Gatekeeper

The function of the gatekeeper in altering what we receive from the mass media is one of *limiting* and *expanding* our information. Assume one morning that a television assignment editor dispatches a news crew to cover a music festival. When they arrive, the news crew finds the festival

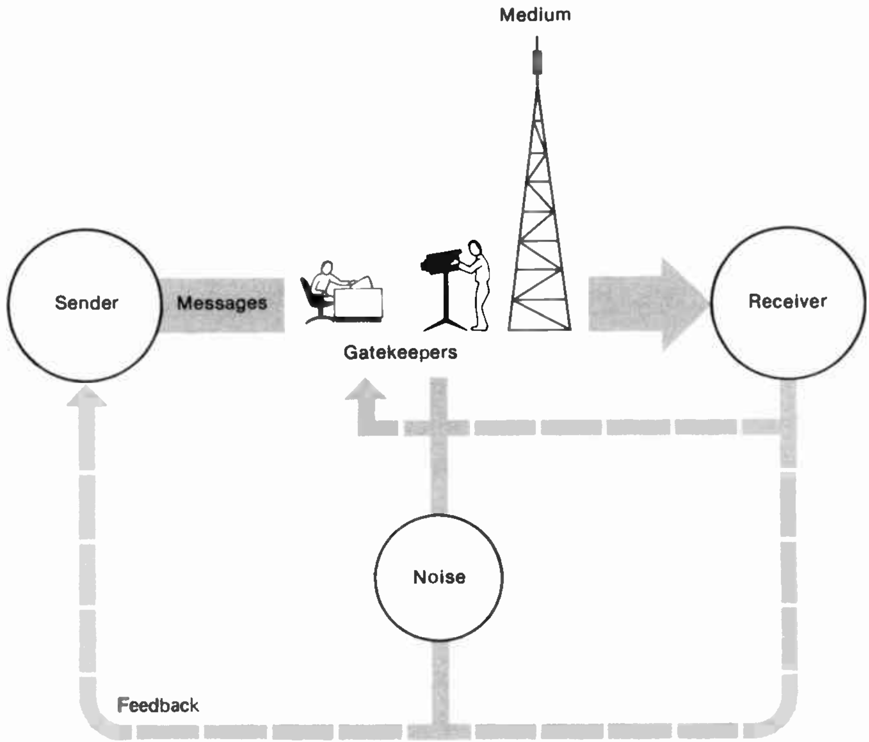


Figure 1–5 Basic model of mass communication.

spread out over a city block with every type of musician participating. Violinists, pianists, guitar players, and groups of musicians are playing everything from bagpipes to kazoos.

Upon seeing the television crew arrive, all of the musicians begin to play, each trying to gain the attention of the news crew. The reporter in charge of the story decides to focus on the bagpipe players. She bases this decision on a number of things. For one, the colorful costumes of the musicians will look good on color television. The bagpipes are also something the average viewer does not have the opportunity to see very often. In addition, the leader of the group is from Scotland and has a distinct Scottish accent. His voice alone will help hold the viewers' attention. That night our bagpipe players appear on the evening news.

Now let's examine how the news crew (gatekeepers) affected the information we received. First, they *expanded* our informational environment by offering us information we otherwise would not have received. The music festival may have been in an outlying community, and we either did not have the time or did not want to go to the trouble of driving all that way to attend it in person. On the other hand, the crew also *limited* the information we received. For instance, many more performers were at the music festival than just those who played bagpipes. However, because the news crew chose to focus upon that one group, we were not exposed to any of the other performers. Had we been present at the music festival, we probably would have seen everyone perform. But because we watched a report of it on the evening news, we were seriously restricted in the amount of information we received.

In summary, gatekeepers actually serve three functions: (1) they can alter the information to which we are exposed; (2) they can expand our information by making us privy to facts of which we would not normally have been aware; and (3) they can limit the information we receive by making us aware of only a small amount of information compared to the total amount we would have been exposed to if we had been present at an event.

Delayed Feedback

Another distinction between mass communication and other types of communication is delayed feedback. Remember when you were sitting in the classroom listening to the mathematics lecture? In that situation, you could give instant feedback to the instructor. You could raise your hand, ask a question, and probably have your question immediately answered. However, when you were watching the mathematics lecture on television, this immediacy vanished. If you did not understand something and wanted to ask a question, you only could telephone the station if the program were live, or perhaps write a letter to the professor. Either of these alternatives is feedback, but this time, it is *delayed feedback*.

New Technology: Altering Delayed Feedback

New developments in broadcast technology have in some cases altered the "delayed feedback" of mass communication. New two-way, interactive media do permit instant feedback under some circumstances. For instance, the instructor teaching the mathematics course via television may have two different television monitors in front of the lecturn, each permitting her to view students in two different classrooms hundreds of miles away. In turn, all of the students can see and hear the instructor on their television monitors located in each classroom. A two-way voice connection permits the instructor to hear any questions the students may ask and to answer them immediately. Although messages are being directed toward a large number of people through a mass medium, instant feedback is possible in this case. New developments in cable technology promise to bring similar response possibilities to the home viewer on a broad scale.

Communicative Noise

Noise can exist in mass communication just as it can in intrapersonal and interpersonal communication, as Figure 1–3 illustrates. First, noise can appear in the processing of information through the gatekeeper. Keep in mind the gatekeeper can be many different people or groups of people, all part of the processing of information. When information is passed from one gatekeeper to another, it can become distorted.

One example of noise in the communicative process occurred when a group of reporters covered an incident along an interstate highway in the Midwest. A truck loaded with two canisters of phosgene gas stopped at a truck stop. The driver of the truck smelled a peculiar odor and decided that one of the canisters was leaking. He became sick and was taken to a local hospital. When state police learned from the invoice what the truck was carrying, they notified authorities at a local army depot. The state police then blocked off an exit on the interstate highway almost twenty miles away. It was the logical place to divert traffic since it was next to a main feeder highway, which made an excellent detour in case the highway immediately adjacent to the truck stop had to be blocked off.

When all of this information was processed into the news media, all under the pressure of deadlines and semicrisis conditions, it was distorted considerably. First, news reports left the impression that the entire truck was loaded with phosgene gas, not merely two canisters. Obviously, a leak in a tank of gas the size of a gasoline tanker was much more serious than a single canister about five feet high and less than two feet in diameter, strapped to the back of a flatbed truck. Second, because phosgene gas had been used in World War II, the wire services began to refer to the canisters as containing "war gas." Added to this was the news of the roadblock twenty miles away, which left the impression that everyone in a twenty-mile radius of the truck stop was in danger of inhaling war gas!

The network of gatekeepers that covered the story included a group of reporters from three radio stations, at least two newspapers, two wire services, two television stations, and the local and military authorities who also were dispensing information. The "institution" of gatekeepers was substantial, and much information was processed and eventually distorted.

Reducing Communicative Noise

Just as new technology has altered the concept of delayed feedback, it also has altered noise, primarily by reducing it. Thirty years ago, it would have been almost impossible to carry live pictures and sound from one continent to another. Back then, the speech of a European leader would have been reported first by a correspondent and then fed to a wire service editor in the United States. The wire service editor would have then rewritten the correspondent's report before sending it over the teletype to subscribers. This entire process was subject to much distortion and noise, because of the number of gatekeepers involved.

Today, although that process still takes place, it is now possible for a videotape of a speech to be sent by satellite into the homes of viewers thousands of miles away. Thus, the viewer watches the picture and listens to the voice of the political leader on the evening news in place of the correspondent's interpretations, thereby reducing the possibility of noise. Even the newspaper reporter can carry a small recorder, almost as inconspicuous as a note pad, and reduce the chance of misquoting a source. Still, few systems of processing information are perfect. Remember that although broadcast technology can reduce noise, the human factor is always present to return some noise back into the system.

the social context of mass communication

Our discussion thus far has been concerned with messages being sent, processed, and received. Although we have seen how gatekeepers act upon those messages, we should also realize that social forces act upon senders, gatekeepers, and receivers, and influence how they react to and process messages.

Consider the analogy of the computer. Data is fed (sent) into the computer in which it is processed and then presented, usually in the form of a printout. You might feed the computer a series of numbers, of which the computer will add and print out the answer. If you fed the same set of numbers into the computer each time, the computer's answer would be the same each time. Such is not the case with messages sent, processed, and received by mass communication. People are not computers, and we do not live in a vacuum. Messages causing one reaction at one time may cause an entirely different reaction another time. A politician's speech that attracted the attention of one gatekeeper may not attract another gatekeeper's attention. Let's examine this in more detail.

Social Context of Senders

Assume that you have decided to run for a political office, and it is time to begin the long arduous trail to election day. In writing your speech to kick off your campaign, you want to convey to the crowd those qualities you feel will truthfully express your character, your position on the issues, your background, and your intentions. As you approach the podium in a small rural community, you think about the times you have seen scenes like this before. The serenity of your childhood, the familiar faces of people you do not know but really do know, the soft mellow breeze—everything is there—including a reporter from each of the two local radio stations.

You begin your speech. You talk about things and people that have influenced your life. You talk about farm prices, having grown up on a farm, and know what you are talking about. You relate your personal experiences of meeting expenses during the harvest season and borrowing money to buy tractors. You also talk about the plight of small business people, for after the farm failed, your family opened a clothing store. All of these social forces had a direct affect on your campaign speech. Now how did your speech affect the two radio reporters (gatekeepers)?

Social Context of the Gatekeeper

When you listen to the newscasts of the two radio stations later that afternoon, you are surprised to find they each covered different parts of your speech. One reported your comments on farm prices and only briefly mentioned statements about small businesses. The other station detailed your statements about the small businesses but skimmed your comments about farm prices. Although you considered both reports objective, you wondered why they focused upon different subjects. You later discover that the reporter who reported your comments on farm prices not only grew up on a farm but also owned one. The other reporter grew up in the suburbs, his father had a small business, and he had no love whatsoever for farming. Each reporter had interpreted your speech in this instance, in accordance with his own particular background. Unlike a computer programmed to select and process certain information, the two reporters were as different as were the forces influencing them.

Research has called these phenomena *selective perception* and *selective retention.* Selective perception means you perceive only certain things, such as those which are most familiar to you or which agree with your preconceived ideas. The reporters' backgrounds and resulting selective perception created two different interpretations of the speech. Selective retention means we tend to remember things which are familiar to us or which we perceive as corresponding to our preconceived ideas. Research implies that these can become even more prominent when covering controversial issues.[12]

Another influence on the story might be the reporters' peers. The reporter may belong to a professional association and adhere to a code of ethics. The code of ethics in turn could have a direct effect on the stories processed by the gatekeepers and consequently received by the public. What if the music festival we discussed earlier had charged a $10.00 admission fee? And what if the assignment editor, as part of his or her professional ethics, had prohibited any of the staff from accepting free tickets to any event while assigned to cover that event? Admission to the festival, therefore, for the entire news crew would have come to $30.00. But what if the manager of the station had refused to pay the $30.00 admission fee for something "as unimportant as a music festival." The editor might have decided finally not to assign a news crew to the festival. Do you agree with that decision?

Social Context of Receivers

Just as gatekeepers do not operate in a vacuum, neither do receivers of mass communication. Our family, co-workers, peer groups, and organizations all affect how we receive and how we react to messages from the mass media. In this realm, interpersonal communication also is very important. For instance, upon hearing the report of your campaign speech over one of the radio stations, one local listener thinks your speech has some strong, positive merits. Yet her friend has an entirely different opinion. Since the listener respects her friend's opinion, she, in turn, changes her opinion of your speech. In this case, the friend acted as an *opinion leader, a person who is relied upon to provide us with an interpretation of messages originally disseminated from the mass media.* [13]

Let's use another example. Suppose you are watching television and see a commercial about a new headache remedy. The remedy claims to be better than aspirin, to cause fewer side effects, and to work much faster. You have been having trouble with headaches, but instead of running out to buy the new remedy you call your friend, a nurse whose opinion you respect. The nurse recommends the new remedy, and the following day you purchase it and take two pills. It works. Notice, however, that it was not the commercial that convinced you to purchase the medicine. Although the commercial helped, your friend ultimately convinced you. In this case she served as an opinion leader. Had she not recommended the remedy, the chances are you might not have bought it then.

Interrelationships of Senders, Gatekeepers, and Receivers

In reviewing examples of what occurs when information is processed through the mass media, you should begin to see many interrelationships among senders, gatekeepers, and receivers. In dealing with the concept of homophily again, it was this perceived "sharing" or "overlap" of experiences between you and the two radio reporters that caused each to report different parts of your campaign speech to listeners. Similarly, the radio listeners interpreted your speech in certain ways, also because of this sharing or perceived sharing of experiences, attitudes, and other factors. In fact, listeners may even have selected one radio station over another because of the perceived similarities between them and the reporter. Similar in some ways to selective perception and selective retention, selecting one radio station over another in this case would represent *selective exposure*, exposing yourself to information which you perceive to support your beliefs or ideas. We shall examine more of these interrelationships in greater detail when we talk about broadcast audiences.

broadcasting as mass communication

By now you should begin to see how broadcasting enters into the process of mass communication. Looking closer, you will notice that between the senders and receivers of broadcast communication are the broadcasting stations. These, along with supporting and allied organizations, have a direct effect on the messages sent through this medium of mass communication. The stations represent both standard broadcast radio and television stations as well as cable television, commonly called community antenna television or (CATV), and closed circuit television (CCTV).

Many secondary organizations affect the operation of these broadcasting stations (Figure 1–6).[14]

Program Suppliers. Program suppliers provide stations with programming ranging from Hollywood game shows to major spectaculars. Many of these are already familiar to us. They include such major television networks as the CBC in Canada; the BBC in Great Britain; NHK in Japan; ABC, CBS, NBC, and PBS in the United States; and numerous others worldwide. Television production houses, such as MTM Enterprises, creators of "Lou Grant" and "The Mary Tyler Moore Show," now in syndication, are other program sources. Their programs either are sold directly to the networks or are distributed through major distribution companies, such as Viacom. Not all program sources deal with entertainment. News program sources have become increasingly important as communication links with satellites continue to shrink the world and whet our interest in international events. Two widely used radio news program sources are United Press International Audio and Associated Press Radio.

Supporting Industries. In addition to program suppliers are advertising agencies, which place commercials on stations, and station representatives, who act as national salespersons for a station or group of stations.

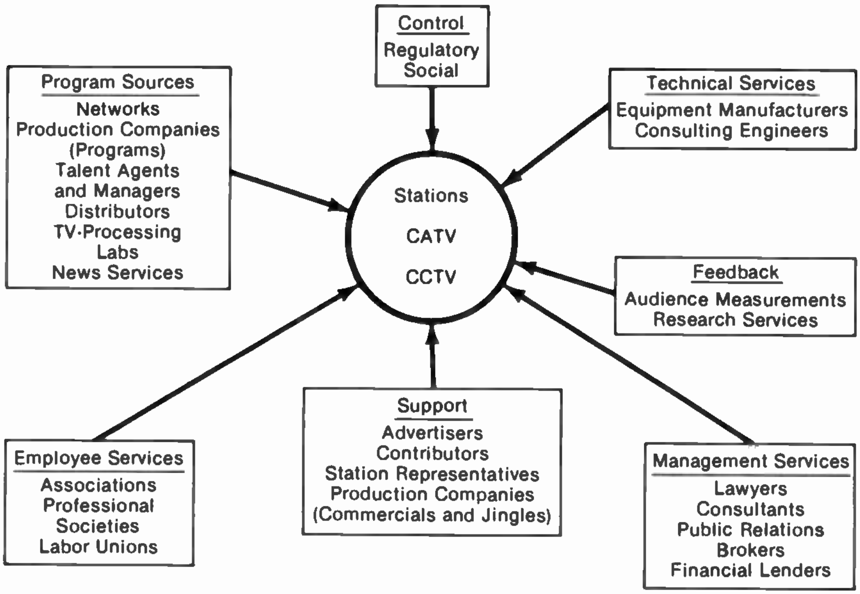


Figure 1–6 The institutions of broadcasting. Many allied organizations support broadcasting. A production company producing a network show, a communications lawyer, a technician, an advertising executive, all are part of these support organizations. (Adapted from Wilbur Schramm and Janet Alexander, "Broadcasting," in *Handbook of Communication*, ed. Ithiel de Sola Pool and others, p. 586, © 1973 Rand McNally College Publishing Company. Reprinted by permission.)

Professional Organizations. Within any industry or profession are employee services ~~linking employees~~ together for a variety of reasons, professio~~nal to purely social~~. Broadcasting's version of these include the National Association of Broadcasters (NAB), the National Cable Television Association (NCTA), and the National Association of Radio Broadcasters (NARB). Among the more narrowly defined organizations are the Radio Television News Directors Association (RTNDA) and American Women in Radio and Television (AWRT). There are over 100 other broadcast employee services in the United States alone. Labor unions also comprise a large share of the broadcast employee membership, especially at metropolitan stations and networks. Major unions with a foothold in broadcasting include the International Brotherhood of Electrical Workers (IBEW) and the Communication Workers of America (CWA).

Control. ~~Control of broadc~~asting ranges from governmental to social. At the national level, governmental ~~control is repre~~sented by the Federal Communications Commission (FCC) and the National Telecommunications and Information Administration (NTIA). In the former, control is in the form of specific laws and regulations. In the latter, it is oriented more toward policy issues. State and local governments may also control broadcasting, cable in particular.

In the social control arena, public interest groups, such as Action for Children's Television (ACT), lobby both legislators and the stations themselves. The National Congress of Parents and Teachers (PTA) became active in holding hearings on television violence in 1976 and 1977. Those hearings culminated in a report to the industry and pressure to reduce violence on television.

Advertisers and stockholders also exercise control over broadcasting. In fact, a small market radio station may be just as fearful of losing its biggest advertiser as it is of a visit from an FCC inspector. Why? Because advertisers, especially in smaller communities, can often "influence" the content of broadcast programming. If the local car dealer spends a huge sum of advertising money on a station, his drunk driving charge may conveniently be absent from the morning news, all on the strong suggestion of the station manager. Or sponsors may refuse to air their ads during violent programming.

Technical Services. The hardware components of broadcasting have spawned a giant industry of people in everything from producing television and radio receivers to engineering consulting. Names like General Electric, Zenith, SONY, Panasonic, RCA, Motorola, and others all vie for this lucrative broadcasting market. In addition, companies and governments are active in producing and servicing satellite and microwave systems which span the globe. As in any industry, broadcasting fosters its own technical service—the consulting engineer. When an antenna on a 2,000-foot tower needs fixing, (Figure 1–7) it is hardly the job for the local TV repairperson.

Audience Measurement Services. An audience is the lifeblood of any mass medium, broadcasting being no exception. Measuring this audience uses the talent of a host of survey companies. Others specialize in customized surveys, such as measuring the effectiveness of a station promotion, undertaking a station image survey, or initiating a personality recognition survey among the viewers.

Management Services. With the increasing complexity of broadcasting, few broadcast managers have the skills necessary to handle all the functions of the station, so they must rely on management consultants. Among the most important of these are consulting attorneys hired by broadcasters to help them process the mountain of governmental forms they now must file, and to give complicated legal advice. Most of the major communication law firms are in Washington, D.C., close to the

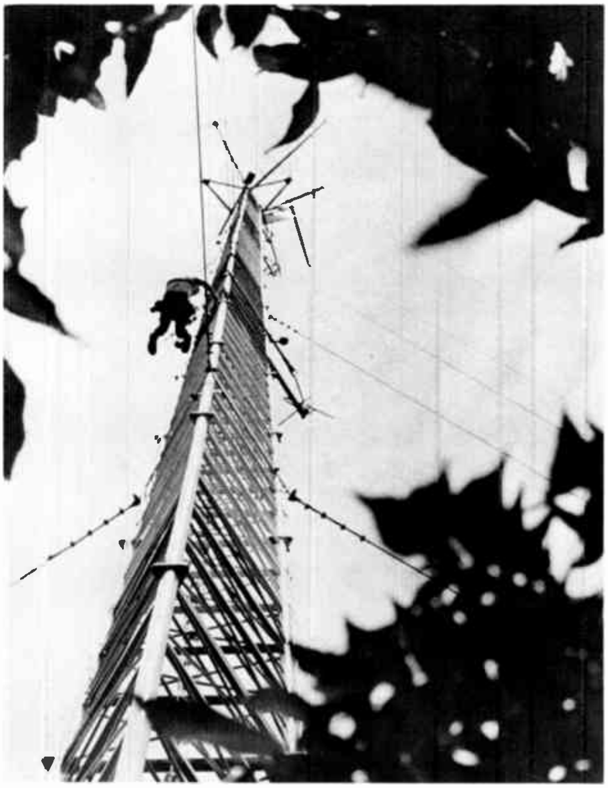


Figure 1-7 Technical services supporting broadcasting include highly trained technicians. Even the smallest stations use consulting engineers and tower construction companies. Pictured is a tower climber servicing the receiving antenna for a major cable system. (NCTA)

FCC. They include Cohn & Marks; Pittman, Lovett, Ford, and Hennessey; and many others.

Broadcast promotion services help with specialized campaigns, such as a station contest or station-sponsored fairs or concerts. Many stations now employ people full-time to handle these tasks.

When it is time to buy or sell a broadcasting property, the broadcast broker becomes important. The "realtor" of broadcasting, the names of George Moore & Associates; Richard A. Shaheen, Inc.; and R. C. Crisler & Co., Inc. are household words to broadcast managers and investors wanting to acquire interests in broadcast properties.

Although we have discussed each of these allied organizations and services as being separate, keep in mind that they interrelate to each other. The production company is just as concerned about the FCC's stand on obscenity as the broadcaster is. The attorney's advice is just as valuable to the advertising agency producing a broadcast commercial as it is to the station manager. These organizations and interrelationships are the interactive "process" of broadcasting in our society.

where this book will take us

Our first look will be at the early years of broadcasting, the years of new discoveries, which in their time rivaled the discoveries of our space age. It was a time of anticipation and little hope lost at any failure. We shall examine the development of broadcasting, its programming content, and its criticism. We also shall look at its future.

From there, we shall explore the systems that carry broadcast messages not only around the world but also around the corner. We shall learn about national networks and state networks, formal and informal networks, and wired and wireless networks. We also shall examine international broadcasting from London to Leningrad and from Switzerland to Southeast Asia. And we shall go inside the corporate and educational institutions to see how broadcasting is transforming them.

To understand how specific controls affect the broadcast media and consequently the messages we receive, we shall examine such organizations as the FCC and the laws that govern broadcasting. We shall look at social controls, as exercised by such formal groups as ACT and NAB.

The broadcast audience and how research has evaluated the medium will comprise the fourth section of this book. Terms like "demographics," "psychographics," "ratings," and "rating points," will become important.

To view the world of decisions and decision makers, we shall explore the inside of a broadcasting station, meeting the managers and the managed. We shall plan a rate card, make an advertising buy, and understand the "bottom line." To help us use the library more effectively in our research about broadcasting, we shall conclude with a library guide.

summary

In order to understand broadcasting, you first must understand communication. Communication includes intrapersonal communication, or communication within ourselves, interpersonal communication, or communication between people, and mass communication, which is messages directed toward people via a mass medium. Regardless of the type of communication, the potential for noise is always present to disrupt the flow of messages between sender or receiver. Traditionally, delayed feedback and the presence of gatekeepers have distinguished mass communication from intrapersonal and interpersonal communication. However, new technology, the increase in the use of closed-circuit television, and broadcasting in business and education, have all altered the definition of "mass" as it applies to broadcasting. Today mass media may be directed to a small and specialized audience.

The primary components of broadcasting are the stations themselves; cable television, commonly called community antenna television or CATV; and closed-circuit broadcasting or CCTV. All secondary organizations affect these institutions and include program sources, employee services, controls, support industries, technical services, audience measurement services, and management services.

spotlight on further learning

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part 1

History and Development

2

the beginning of wireless

FOCUS After completing this chapter we should be able to

Explain the work of Henrich Hertz and the discovery of electromagnetic waves.

Discuss Marconi's early experiments in Italy, England, and North America.

Trace the development of the Marconi companies.

List the contributions of Thomas Edison, J. Ambrose Fleming, and Lee de Forest to the early wireless.

Identify the contribution of Nathan B. Stubblefield to the early history of voice broadcasting.

Explain how Reginald Fessenden and Ernst Alexanderson contributed to long-distance voice broadcasting.

Understand the relationship between the crystal detector and amateur radio.

We are about to undertake a journey, one that will begin in the mid-nineteenth century and lead us into the twentieth century.[1] It is a journey through history, but do not be afraid of the word "history." History is exciting if you relive it and meet the people who were part of it. The historian Alan Nevins compares history to a sextant on a ship. History tells us where we have been so we can better understand where we are going. The television program showing us sporting contests at an Olympic village, the view from outer space, or the sounds of contemporary music from our hand-held transistor radio, all were conceptualized long ago. These receivers of communication that today we take for granted were developed in the laboratories of scientists with the same elation and excitement that scientists have today when discovering new knowledge. Let's share some of this excitement in learning how broadcast communication came to make such an important impression on our lives.

Keep in mind that not all of the players in this epoch of scientific achievement can be recognized, for three reasons: (1) many of them conducted research, but never took the time to publish their results so that other scientists could share in their discoveries; (2) others conducted research and, although in some cases published it, never patented their inventions. Thus, someone else was given that recorded place in history; and (3) still others were interested in pure science as opposed to the practical application of their discoveries to society. The result, again, was recognition of those who made practical application of their research, sometimes overshadowing their academic peers in general publicity. The latter also tended to reap the greatest economic rewards, not only from patents but also from the development of full-scale corporate endeavors, sometimes extending worldwide.

Henrich Hertz and electromagnetic waves

In 1857 Henrich Rudolph Hertz (Figure 2–1) was born to a middle-class family in Hamburg, Germany. Taught an hour a day by tutors and obtaining the rest of his knowledge in his spare time, young Hertz developed a keen interest in science and outfitted himself with his own home laboratory. Engineering first whetted his appetite, but after a year of study at the University of Munich, he moved to Berlin to study pure science under the well-known German scientist, Hermann Ludwig Ferdinand von Helmholtz. It was there under the lure of the Berlin prize of

Figure 2–1 Henrich Hertz. His early experiments began in a home laboratory and eventually reached Berlin. Using an experiment in static electricity, he stumbled upon proof of the presence of electromagnetic waves. (der Universität Karlsruhe)

1879 that von Helmholtz encouraged his twenty-two-year-old apprentice to examine further the inquiry into electromagnetic forces. The early experiments were not very fruitful, and for a while, Hertz occupied his time with other experiments. He never, however, ceased to be fascinated by the potential proof of the travels of electromagnetic energy through space.

One day while lecturing, Hertz was using two pieces of spiraled wire in discharging static electricity. He noticed that when a spark gap was introduced into one coil, it produced a current in another coil. What Hertz had stumbled across was the presence of very high-frequency electromagnetic waves which were generated by the spark. From there the investigations proceeded systematically, and from 1886 through 1889, using both transmitting and receiving spark gaps at high frequencies, he was able to provide further proof of the presence of electromagnetic waves. Today we call these radio waves, which catapult radio, television, and other communication around the world and into outer space.

Both von Helmholtz and Hertz died in 1894. Some scientists picked up Hertz's pure science. Others, more concerned with the practical application of these principles, concentrated on improving long-distance communication between people. It is these applied efforts to which we will now turn our attention.

wireless is born: Marconi the inventor

The telegraph had captivated America and Europe. Samuel Morse, its inventor, died two years before the second son of Giuseppe and Anna Marconi was born, on April 25, 1874. Guglielmo Marconi (Figure 2–2) was a child of parents who, by late nineteenth-century standards, were quite well to do.[2] But the young, restless Marconi was not like the rest of his family, comfortable with gracious Italian living. Often he irritated his father when he interrupted the quiet conversations at an evening meal with persistent, unrelated questions. This did not improve when, after reading a scientific magazine, Guglielmo developed a keen interest in the work of Henrich Hertz. Finally, from the top floor of their home, with his father's rancor and his mother's reinforcement, Guglielmo Marconi began to experiment. With crude tables, boards, hanging wires, and other paraphernalia, he began to duplicate the experiments of Hertz.

Early Experiments in Italy

To the family, the work of the young son in his upstairs laboratory was intriguing but of questionable value. The boy's father felt that he was

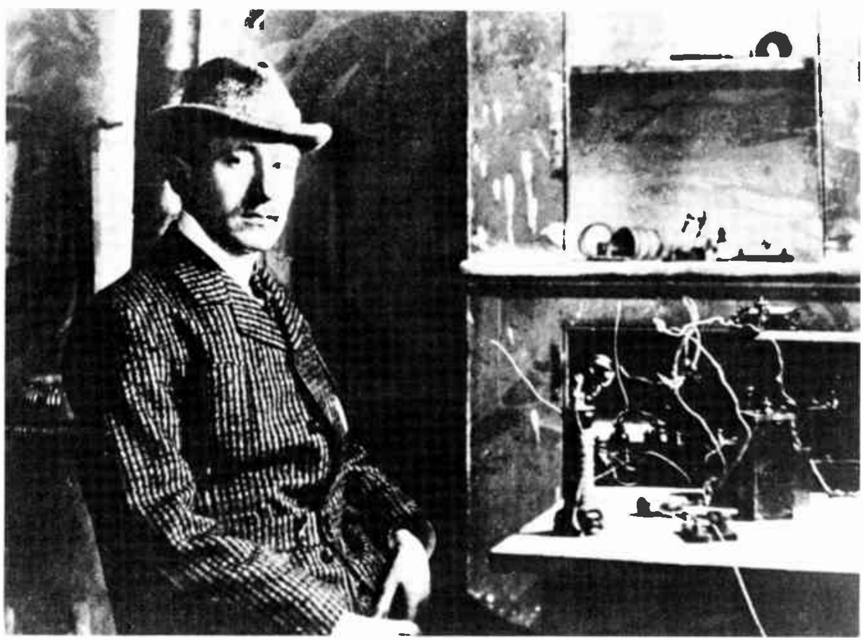


Figure 2–2 Guglielmo Marconi. As much a businessman as an inventor, Marconi created a worldwide wireless empire with companies in England, the United States, Canada, and other countries. (RCA)

wasting the best years of his life, but became more interested when Guglielmo asked him for money to advance his work beyond the experimental stage.[3] Being a stern and practical businessman, his father first wanted a demonstration. This was followed by a long discussion as to how his father would get a return on his money. The whole scenario is rather humorous, considering in retrospect that the boy's corporate empire would eventually gross billions. Finally the two agreed to an initial investment, and Guglielmo went to work building his first transmitting device. Using a reflector sheet strung between two poles (Figure 2–3), he first managed to receive a signal across the room. The receiver used a device called a *coherer*—a small glass tube with wires in each end and filled with metal filings which would collect between the two wires whenever electricity was applied.

Marconi, already familiar with the work of Samuel Morse, immediately realized the potential for long-distance communication.[4] He also had a sense of urgency, because to him the principle was extremely simple. Why had someone not thought of it before, or more importantly, applied it? His experiments became more and more frequent and the range of his signals, more and more distant. The distances became farther and farther, until on top of a hillside twenty minutes from his home, the experiments reached a threshold. Could the signal go beyond the hilltop?

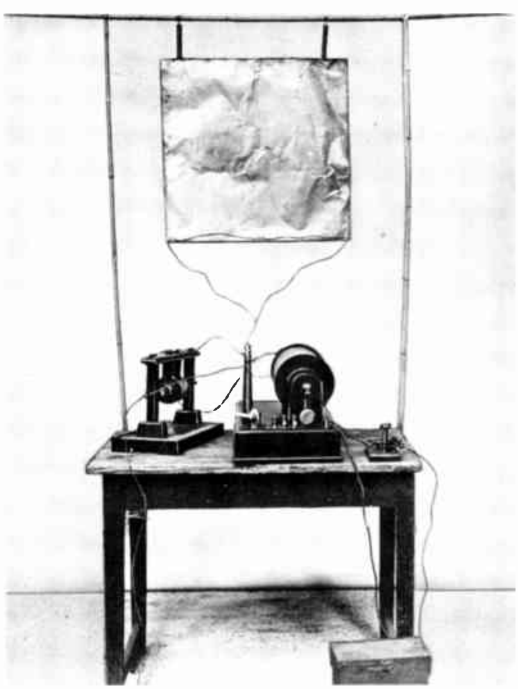


Figure 2–3 Marconi's first transmitter used in his early experiments in 1895. The large piece of tin suspended above the table served as the antenna. (The Marconi Company Limited, Marconi House, Chelmsford, Essex)

If the invention were to be a success, it would have to be able to leap over hills, mountains, buildings, and oceans. The crucial test sent his brother and two helpers carrying the receiver and antenna apparatus over the hilltop out of sight of the villa. Guglielmo's brother also carried a gun with instructions to shoot to confirm the signal. No sooner had Guglielmo fed current to the transmitter than the shot rang out. Now the capital that his father had provided had to be increased before the experiments could reach the next level. In attempting to obtain government backing for Guglielmo, a letter was sent to the Italian Post Office Department. The reply was negative. But if Italy were to say no, perhaps the great naval power of the day would say yes. With his mother's encouragement and accompaniment, Marconi was off to England.

Experiments in England

The first stop was customs. Here the journey hit one of its low points as ignorant customs inspectors ripped at the equipment until it was all but destroyed. Marconi managed to reconstruct the broken pieces which had been so carefully crated in Italy. The next step was to be sure no one else captured the idea. For four months, Marconi and his mother slaved over the papers which were to be presented to the London Patent Office.[5] The first specifications were filed on June 2, 1896. The complete diagrams and detailed specifications were filed on March 2, 1897 under the title, "Improvements in Transmitting Electrical Impulses and Signals, and an Apparatus Therefor." On July 2, 1897, patent number 12,039 was granted to the twenty-three-year-old Italian inventor. The experiments now continued, but it still was necessary to get support from the government for capital to develop the invention to its full potential.

The help and support Marconi needed came first from the chief engineer of the British Post Office, William Henry Preece. Preece liked young Marconi, and with Preece's support, he began his experiments in England, first between two buildings and then a major demonstration across the Bristol Channel, a distance of about three miles. The press noticed Marconi's wireless and published the news to the world. Attention was being bestowed on the device beyond any measure ever dreamed of by the young inventor (Figure 2–4). Along with offers to buy the rights to his invention came the more humorous offers of marriage from women who said Marconi's waves made their feet tickle.[6] The distance of his experiments increased from three to thirty-four miles. Publicity abounded again when Marconi was commissioned to install a wireless on a tugboat to report the sailing races at the Kingston regatta. He secured other patents. One of the most important, patent 7,777 for a selective tuning device, was granted in 1901.

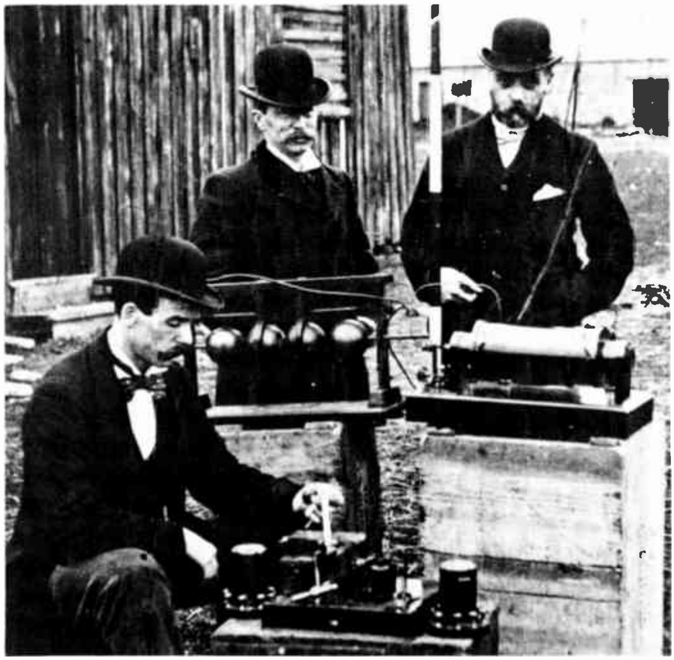


Figure 2–4 Three officials of the British Post Office Department examine the equipment Marconi used to test the first successful wireless across the Bristol Channel in 1897. The British Post Office Department provided both encouragement and financial support of Marconi's early work. (The Marconi Company Limited, Marconi House, Chelmsford, Essex)

Wireless across the Atlantic

The year 1901 also was the year of the most convincing experiment of the power of wireless communication. Still to be hurdled was the vast expanse of the Atlantic Ocean. Marconi left England for America in February, 1901 and headed for Cape Cod, the point he felt best suited to the test of his wireless. But like any stretch of New England coastline, harsh winter winds can play havoc with any structure not built for permanency. Likewise, the Atlantic can do the same on the English coast. For Marconi, 1901 had double disasters. News arrived that storms had toppled the antenna at his installation at Poldhu, England (Figure 2–5). Within weeks, the same fate befell the Cape Cod station. Marconi now decided to transfer operations to Newfoundland, then a British colony. Using a bit of intrigue, he told local officials he was attempting to communicate with ships at sea, with no mention of the real purpose, transatlantic communication. Instead of antenna towers, he planned to use balloons, and packed six kites as a back-up.[7]

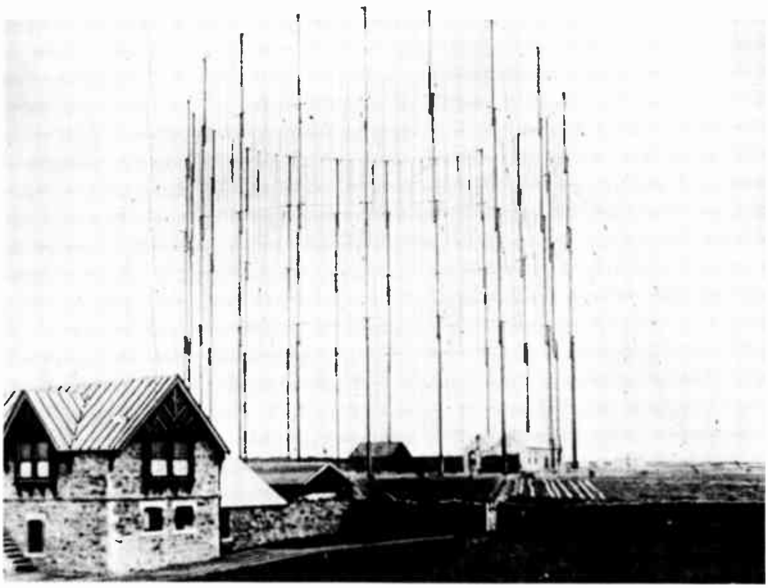


Figure 2–5 The first circular antenna arrangement constructed at Poldhu, England and designed for Marconi's transatlantic test. There were 20 wooden towers, each 200 feet high. The structures collapsed under gale-force winds which hit England in September, 1901. (The Marconi Company Limited, Marconi House, Chelmsford, Essex)

The experiments in Newfoundland started on December 9, 1901. First, the balloons were tested, but a line broke and the balloon headed for open sea. The next decision was to try one of the large kites. Marconi's assistants, George Kemp and P. W. Paget worked with the kite until it soared hundreds of feet, stringing behind it the antenna wire connected to the essential receiving equipment on top of Signal Hill, Newfoundland (Figure 2–6). Serious monitoring started on December 12, 1901. There were no results in the morning; nothing was heard from Poldhu. Spirits were low as the men continued to listen for the tapping signal that would indicate that England was calling. At 12:30 P.M., Guglielmo Marconi listened intently as the tapping sound of three dots, signaling the letter *S*, crackled through the earphone. Handing the earphone to Kemp, the assistant verified the signal.

Reaction to Transatlantic Wireless

The world would spend the rest of December reading about it.[8] *The New York Times* called it "the most wonderful scientific development of recent times" and headlined the story *WIRELESS SIGNALS ACROSS THE*

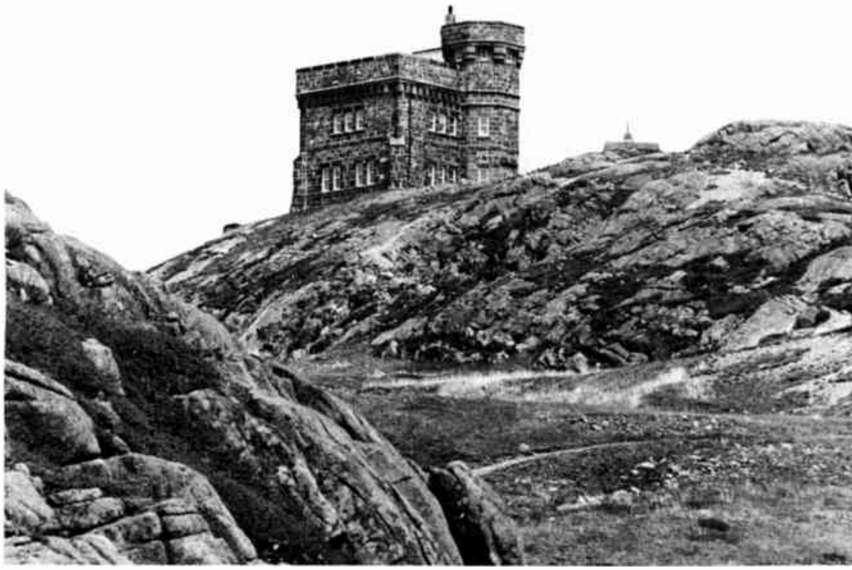


Figure 2–6 Signal Hill, Newfoundland where Marconi made his first successful transatlantic wireless contact. (Newfoundland Department of Tourism)

ATLANTIC. Across the ocean, the *Times* of London headlined *WIRELESS TELEGRAPHY ACROSS THE ATLANTIC.* The London paper described how Marconi had authorized Sir Cavendish Boyle, the Governor of Newfoundland, to "apprise the British Cabinet of the discovery, the importance of which is impossible to overvalue." Not forgetting his beloved Italy, Marconi informed the Italian government himself. Magazines were equally enthusiastic about the feat.[9] *Century Magazine* called Newfoundland "the theatre of this unequaled scientific development." *The World's Work* labeled the transatlantic transmission "a red letter day in electrical history." *McClure's Magazine* demanded: "Think for a moment of sitting here on the edge of North America and listening to communications sent *through space* across nearly 2,000 miles of ocean from the edge of Europe!"

Not all, however, was as happy as in Newfoundland. The apparent threat of competition between wireless and the cable telegraph surfaced immediately. Cable stocks declined shortly after the announcement of the Atlantic broadcast.[10] The Anglo-American Telegraph Company, which had a monopoly on telegraph communication in Newfoundland, was quick to threaten reprisals if Marconi did not stop the experiments. A few days later, the inventor received a letter from the company stating:

> *Unless we receive an intimation from you during the day that you will not proceed any further with the work you are engaged in and remove the appliances erected for the purpose of telegraphic communication, legal proceedings will be instituted to restrain you from further prosecution of your work and for any damages which our clients may sustain or have sustained; and we further give you notice that our clients will hold you responsible for any loss of damage sustained by reason of your trespass upon their rights.*[11]

The Canadian government, obviously seeing the chance to emulate its neighbor, immediately contacted Marconi and offered full cooperation with the inventor. Public sentiment for the action taken by the telegraph company was unfavorable on both sides of the Atlantic. *The New York Times* criticized the action, and letters to the editor of the London *Times* expressed similar sentiments. The threats, comments, and letters to the editor soon became history as the world began to use the results of the December experiments of 1901.

wireless expands: the Marconi companies

Despite the respect Marconi had for pursuers of pure science, he was much more interested in applying results and harvesting financial rewards.[12] Thus, it was only a short time after his patent had been issued in England that he began formulating a world corporate empire that would stretch over the seven continents and involve millions of dollars in capital. The company that had the most direct effect on wireless development was the Marconi Wireless Telegraph Company, Limited, first formed on July 20, ~~1897 as the Wireless Telegraph and~~ Signal Company, Limited. It was Marconi's father who insisted that the family name should be attached to the venture.[13] The beginning capital amounted to 100,000 English pounds, of which 15,000 went to Marconi for his patents. It was from this 15,000 pounds that he paid the cost of organizing the company. He also received 60,000 of the 100,000 initial shares valued at 1 pound each. The remaining 40,000 went on the open market.

England: Marconi's Wireless Telegraph Company, Ltd.

A year after its formation, the operating capital increased by another 100,000 pounds, and although wireless had captured the imagination of the British, there were warnings for unwary investors. *Investors World,* a financial publication, advised in 1898 that, "from all we can gather, the public will be well advised to keep clear of this concern. . . . Marconi's ingenious ideas do not seem to have made much headway, and it would be interesting to learn what the government officials reported about them."[14] The warning had little effect, and although the investment for years to come did not show much success in paying dividends, the public was always ready to buy up new shares whenever they were placed on the market.

By March of 1912, however, rumors of a contract between the company and the government had a taint of corruption. One rumor suggested that Marconi was treated favorably because of his close friends in Parliament. Some government officials had made a huge profit by selling their Marconi stock when it peaked after the news of the contract being signed. The second set of charges was of manipulation of stock by the American Marconi Company. A committee was appointed by Parliament to investigate the matter. After due deliberation, they came out strongly in favor of Marconi, but the matter was not over. Another committee investigated the role of middlemen and stockbrokers, and still another committee investigated the role of the House of Lords. Libel actions were taken and the stock tumbled. The publicity from the scandal meant that the company only briefly enjoyed the prosperity for which Marconi had long hoped. The future development of Marconi in England would have to wait until after the end of World War I. In North America, the story was much the same.

Marconi's Interests in Canada

Marconi's corporate interest in Canada came after the Newfoundland experience with the cable authorities. He erected a station at Glace Bay, Canada and began major experiments in achieving reliable transatlantic wireless. The first transatlantic service opened on the night of December 15, 1902 when the London *Times* correspondent at Glace Bay cabled his newspaper report across the Atlantic. Two nights later, it was arranged that the American station at Cape Cod would send a message from the United States to the King of England. The signal would be relayed to Glace Bay and from there to Poldhu. As it turned out, the atmospheric conditions were so good that the station in England picked up the signal directly from America.

The London *Times* was infatuated enough by the prospects of transatlantic service that it convinced Marconi to open the station again to send news flashes to England. That lasted for little more than a week until an ice storm sent the Glace Bay antennas crashing to the ground. The station was later reconstructed using a large umbrella antenna.

The American Marconi Wireless Telegraph Company

When Marconi came to the United States in 1899 to report the American Cup races by wireless, he also began an American subsidiary of his English company. To utilize Marconi patents in America, the American

Marconi Wireless Telegraph Company was incorporated in the state of New Jersey in the fall of 1899. The first equipment was used to warn ships of bad weather and coastal conditions, and was installed on the Nantucket Light Ship with a shore station on the eastern shore of Nantucket Island.

That same year, the American company ran into trouble over a proposed United States Navy contract for the installation of Marconi wireless on Navy ships. After a series of tests, the Navy first recommended buying the Marconi equipment. Then after asking Marconi what the cost would be for wireless, the Navy received word that the company would not sell the equipment, but that the Navy would have to rent it. At that point the Navy backed out of the deal. Captain L. S. Howeth, later writing about the negotiations, said: "In light of future events, the Marconi leases and stipulations have proved a blessing in disguise. The foresight of the authorities in not permitting themselves to be shackled with its restrictions, which would have persisted for more than a decade, allowed the Navy a free hand in guiding and assisting in the development of radio in this country."[15]

Despite the loss of the Navy contract, the American company received a boost in assets in 1912 when it won a patent suit against the United Wireless Company. Using a case in England as a legal precedent, the American company charged United Wireless with patent infringement of patent 7,777, the Marconi tuner that could select different signals from a single aerial. United Wireless pleaded no defense, and Marconi assumed control of the company and all of its assets and contracts. It was an unusual way to obtain a corporate merger, but it was a positive boost for the American assets. The U.S. Navy ended up using Marconi equipment after all when World War I began, since the Navy either had taken over or had closed all commercial and amateur wireless stations, many using Marconi equipment.

A young boy named David Sarnoff had been hired by the American company in September of 1906. Shortly after World War I ended, the American company was purchased by the newly formed Radio Corporation of America (RCA). Sarnoff became part of RCA management, later heading the company. We shall learn the reasons for the sale and RCA's early development in chapter 3.

working to improve wireless reception

Although Marconi had successfully transmitted signals across the Atlantic and had developed a world corporate empire, his success had been greatly aided by subsequent developments in wireless communication.

One of the most important areas of scientific investigation was the need for a device that would more efficiently detect and receive electromagnetic waves. The receiving and sending apparatus had to be so big that antennas were the size of football fields, both for transmitting and receiving. Yet the current that entered a radio antenna and received an electromagnetic wave was minute. The great challenge was how better to detect these tiny, almost indistinguishable currents of energy hitting the antenna of a radio receiver. For radio to become a household appliance, the football-sized receiving antennas had to be eliminated.

Edison's Contributions

Some ~~of the first~~ experiments leading to an improved detector came not during the study ~~of radio, but during the~~ study of electric light.[16] Thomas Edison, while in the process of inventing the light bulb, had experimented with a two-element bulb, but had found it impractical. The bulb consisted of two metallic elements in a vacuum, called the *plate* and the *filament.* If a battery were attached to the bulb with the positive connector of the battery attached to the plate and the negative connector of the battery attached to the filament, current would flow through the bulb. If the connectors were reversed, the current would stop. What Edison had invented but discarded was an early two-element vacuum tube, or what was later to be called a *valve,* since it could "shut off" current running in one direction, much like a valve controls steam or water.

The Fleming Valve

J. Ambrose Fleming was an employee of Marconi when one of the big secrets to unlocking future development in wireless was to find some way to measure electromagnetic waves in order to understand better their behavior and their frequencies. Fleming determined that the best way to do this would be to invent a means of measuring the waves as they flowed in only one direction. The secret was in Edison's two-element light bulb. Fleming went to work perfecting the device, patenting the "valve" in England in 1904 and, through the American Marconi Company, in the United States in 1905. The device worked by attaching the plate to the antenna, attaching a wire from the filament to the ground, and then hooking a telephone receiver into this completed circuit. With the "valve" in position, the telephone receiver was able to hear the presence of the waves. His invention was called the oscillation valve or Fleming valve. It was not long, however, before Fleming's device was greatly improved by the inventive hand of an American, Lee de Forest (Figure 2–7).[17]

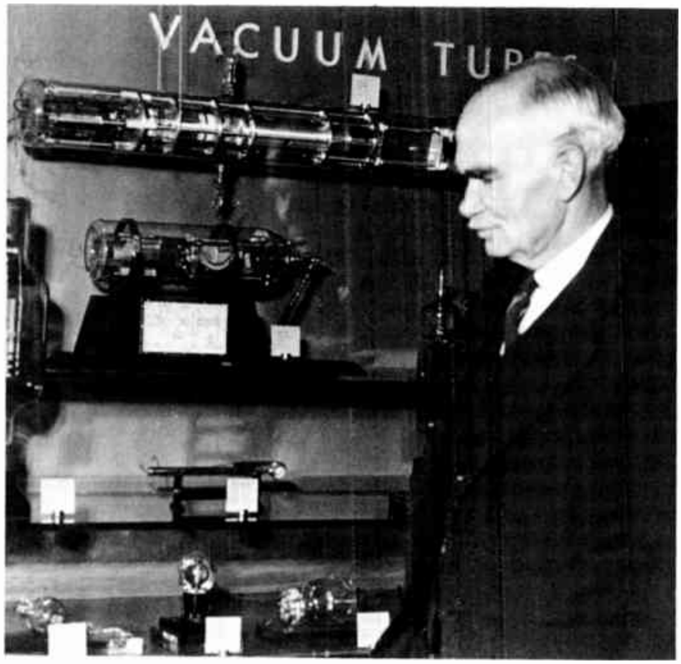


Figure 2–7 Lee de Forest, inventor of the "Audion," the three-element vacuum tube. Lee de Forest based his work on the foundation laid by Hertz. De Forest received a Ph.D. from Yale in 1899 with a dissertation titled "Reflection of Hertzian Wave from the Ends of Parallel Wires." Much of his career was marked by legal feuds with J. Ambrose Fleming. He is seen at the 1939 World's Fair with a display tracing the evolution of the vacuum tube. (AT & T Co.)

de Forest and the audion

The work of de Forest (Figure 2–7) ranks close to that of Marconi in the development of radio. Born in Council Bluffs, Iowa in 1873, de Forest was the son of a Congregational minister who was later to become president of Talladega College in Alabama. After attending Mt. Hermon School in Massachusetts, de Forest entered a mechanical engineering program at the Scheffield Scientific School at Yale University. With a dissertation entitled "Reflection of Hertzian Waves from the Ends of Parallel Wires," he was granted a Ph.D. in 1899. The research done and knowledge gained at Yale and his desire to apply pure science, first to inventions, then to patents, and then to profits, led him on a remarkable career that spanned much of his more than eighty years. He died in 1961 in Hollywood, California where he was closest to one of his most beloved works, talking motion pictures. Our emphasis here, however, is on the invention of the audi~~on, a~~ three-element vacuum tube which revo~~lutionized radio~~.

Adding the Grid to the Vacuum Tube

Lee de Forest ~~discovered that a third~~ element could be added to Fleming's two-element vacuum tube valve. ~~De Forest inserted~~ a tiny grid of iron wires. The result ~~was characterized~~ in an early radio publication:

> *This may not seem much to the uninitiated, but that miniature gadget was the truest "little giant" in all history. . . . that the brain of man ever created. It set unbelievable powerful currents in motion, magnifications of those which flicked up and down the antenna wire, and thus produced voice amplification which made radio telephony a finished product. By adding another tube and another, the amplification was enormously increased.*[18]

With the third element, the vacuum tube now had a filament, plate, and grid (Figure 2–8). Named the audion by de Forest's assistant, C. D. Babcock, de Forest first announced the tube in a paper presented to the October 26, 1906 meeting of the American Institute of Electrical Engineers in New York. After the paper was reproduced in the November 3,

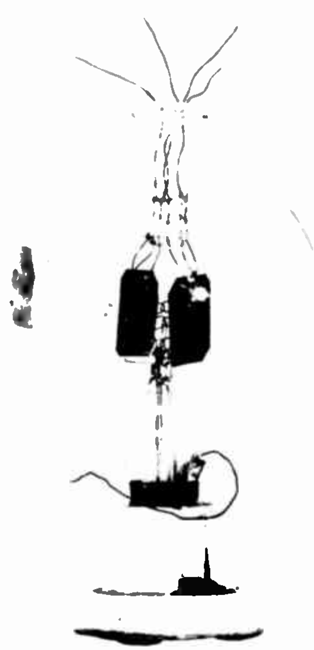


Figure 2–8 Lee de Forest's "Audion" tube. (AT & T Co.)

1906 issue of *Electrical World*, it was not surprising that one of the first reactions to the de Forest discovery came from Fleming.[19] In a letter to the editor of *Electrical World* on December 8, 1906, Fleming attempted to diminish some of the importance of the de Forest invention. Fleming wrote in part:

> *There is a remarkable similarity between the appliance now christ ened by de Forest as an "audion" and a wireless telegraphic receiver I called an oscillation valve. . . . Dr. de Forest's method of using this appliance as an electric wave detector appears, so far as I can judge from published accounts, to be a little different from mine, but nevertheless the actual construction of the apparatus is the same. . . . Even if Dr. de Forest has discovered some other way of employing the same device as a receiver, I venture to think that my introduction and use of it should not be ignored, as I believe I was the first to apply this device. . . as a means of detecting electric oscillations and electric waves.*[20]

De Forest did not sit back and let Fleming's suggestions go unchallenged. He replied to Fleming's letter with a letter to the editor of the same magazine, published in the December 22, 1906 issue. De Forest credited German scientists Johann Elster and F. K. Geitel, not Fleming, as deserving credit:

> *Prof. Fleming has done me the injustice of expressing an opinion based on an extract only of my paper regarding the "audion." In a more complete abstract of that paper published in the* Electrician *of London, it is seen that I mention not only the device described by Prof. Fleming in 1904, but point out the real genesis of this device by Elster and Geitel in 1882, or eight years prior to its rediscovery of Prof. Fleming in 1890. . . . The difference which Prof. Fleming questions may be tersely stated as that between a few yards and a few hundreds of miles; between a laboratory curiosity and an astonishingly efficient wireless receiver employing the same medium but operating on a principle different in kind.*[21]

The Feud with Fleming

The rift between Fleming and de Forest did not end in the pages of *Electrical World.* Lee de Forest went on to patent his audion, but the Fleming valve also had been patented in both England and the United States under the American Marconi Company. It was the United States patent that provoked a lawsuit brought by the American Marconi Company. The case went in favor of the company, which contended that Lee de Forest had read the paper presented by Fleming to the Royal Society of England in 1905 in which Fleming described the oscillation valve, and that de Forest then had used this knowledge to begin experimenting, with the end result being the audion.[22] The case was appealed, and again the court ruled in favor of the Marconi Company and the Fleming patent. Two years passed between the lower court's decision and the appeal. Both de Forest and the Marconi Company continued to manufacture the tubes. To make matters more complex, the court held that, although de Forest had infringed on the Fleming valve, the Marconi Company had infringed on the audion. The result was that neither company could manufacture the devices without the other's consent.[23] The situation was chaotic until the Fleming patent with Marconi expired in 1922. Even more incredibly, the United States Supreme Court in 1943 ruled that the Fleming patent had never been valid in the first place!

Although we might consider Lee de Forest's account of all this as rather biased, his summation of the conclusion of the Fleming-de Forest dispute is worth reading partly because of its humor, and most importantly because it captures the intense rivalry between two men, typical of feuds between companies and inventors in the early development of radio. In his book, de Forest comments on the state of affairs between him and Fleming in 1943 shortly after the Supreme Court decision. Lee de Forest wrote:

> *About this time Sir John Fleming, still unregenerate at ninety-two, published an amazing article in which he ignored all the earlier work . . . claiming even the discovery of the so-called "Edison effect," but never mentioning Edison's name! For this omission I wrote him in righteous reproach, incidentally calling to his attention the recent Supreme Court decision. Fleming's reply evinced profound disdain for what a mere Yankee court might think of his best-loved child. Having married a young opera singer at 84, he lived to the ripe old age of 95, dying in 1945. He never yielded in his firm conviction that he was radio's true inventor!*[24]

Lee de Forest's own modesty is not excused when we remember that he entitled his autobiography, *The Father of Radio.* He also had some words of his own about what radio had become when he told a group of radio executives: "The radio was conceived as a potent instrumentality for culture, fine music, the uplifting of America's mass intelligence. You have debased this child, you have sent him out in the streets in rags of ragtime, tatters of jive and boogie-woogie, to collect money from all and sundry."[25]

breaking the voice barrier: radio telephony

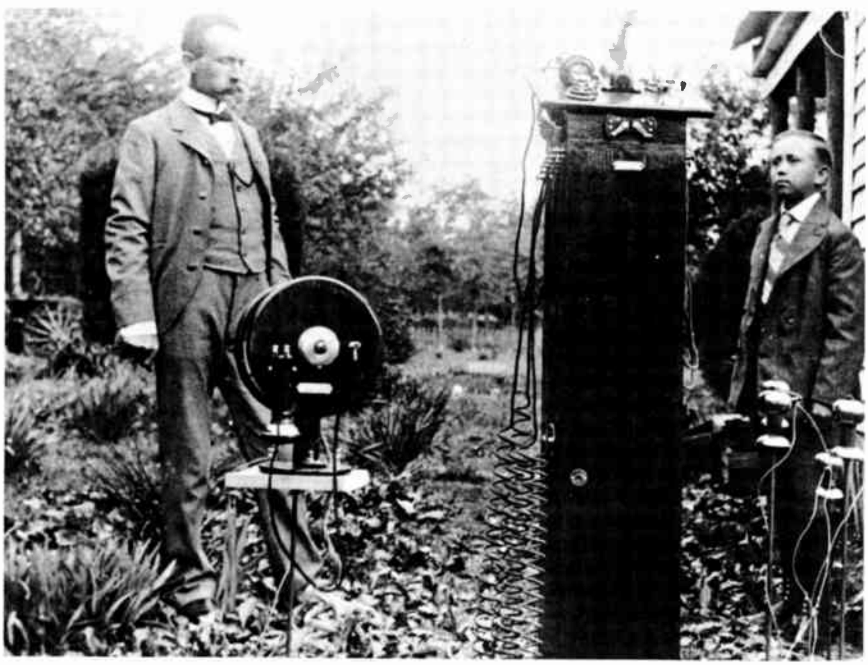
The second challenge to be hurdled in early radio was how to go beyond the "dit-dahs" of the Morse code and the "What Hath God Wrought" of the telegraph to the "O Holy Night" of Reginald Fessenden's Christmas Eve radio broadcast in 1906. The story of voice transmission starts long before 1906, back when early experimenters examined the phenomenon of using the ground and water to act as a conductor for transmitting and receiving "wireless telephone" conversations.

The system had been used by wireless operators in 1838.[26] It applied a process ~~known as *conduction*~~, in which the ground or ~~water~~ would be the conductor, providing the "second wire" in a telegraph hookup. Samuel Morse, inventor of the ~~telegraph,~~ used it in his New York experiments. It was not long before inventors discovered that they did not need any wire at all to communicate between the transmitter and receiver over short distances. ~~Because a current~~ in one antenna would produce a current in another one nearby, a process called *induction*, two antennas in close proximity to one another would ~~make the system~~ work. This was a different principle from that of electromagnetic waves traveling through space that Marconi and others used. Induction created an electrical disturbance in the atmosphere that was detectible only in the immediate vicinity of the transmitter.

Nathan B. Stubblefield and His Wireless Telephone

Before Marconi mastered the Atlantic and while de Forest was studying at Yale, a Kentucky farmer and experimenter developed a means by which voice could ~~be transmitted~~ as ~~much~~ as three miles by using induction. His name was Nathan B. ~~Stubblefield (~~Figure 2–9).[27] Near his

Figure 2–9 Nathan B. Stubblefield (left) and his wireless telephone. As early as 1892, Subblefield is reported to have sent voice by wireless over a short distance at his farm in Murray, Kentucky. His son, Bernard (right) later became an employee of Westinghouse. (Murray, Kentucky Chamber of Commerce)



home in Murray, Kentucky, and later on the Potomac River in Washington, D.C., he successfully transmitted voice without wires. It was in Murray, Kentucky, however, that he received his first publicity. Dr. Rainey T. Wells witnessed Stubblefield's experiments and recollected:

> *He [Stubblefield] had a shack about four feet square near his house from which he took an ordinary telephone receiver, but entirely without wires. Handing me these, he asked me to walk some distance away and listen. I had hardly reached my post, which happened to be an apple orchard, when I heard "Hello, Rainey" come booming out of the receiver. I jumped a foot and said to myself, "This fellow is fooling me. He has wires somewhere." So I moved to the side some 20 feet but all the while he kept talking to me. I talked back and he answered me as plainly as you please. I asked him to patent the thing but he refused, saying he wanted to continue his research and perfect it.*[28]

The demonstration was reported to have taken place in 1892. A modified, Bell-type transmitting device provided the signal which emanated from a large, circular, metal antenna. Other residents of the small town of Murray witnessed a similar demonstration six years later in 1898. Claims of his accomplishments were published in the *St. Louis Post Dispatch* and generated enough interest to bring him to Washington, D.C. for a public demonstration on March 20, 1902. Following the demonstration, Stubblefield said, "as to the practicality of my invention—all I can claim for it now is that it is capable of sending simultaneous messages from a central distributing station over a wide territory. . . . Eventually, it will be used for the general transmission of news of every description."[29]

Commercial exploitation of the invention was not far behind, and in 1903, Stubblefield became director of the Wireless Telephone Company of America. Demonstrations in Philadelphia and Washington, D.C. created more interest in the device; yet it is here that the rest of Stubblefield's life becomes somewhat obscure. There are various reports of what happened to him. One suggests that Stubblefield became disillusioned with how the stock for the company was being handled and on one occasion even charged it with fraud.[30] Stubblefield returned to Kentucky and with the help of local citizens, received a patent for the device on May 12, 1908. Obviously disenchanted with the business developments of his wireless telephone, Stubblefield went into seclusion and continued to research in his workshop-shack near Murray.

If you travel through the Kentucky countryside near Murray today, you may pass the place where Stubblefield was found dead on March 30, 1928, the cause of death listed as starvation. Or you might drive by Murray State College where students are acting in the play of Nathan B. Stubblefield's life, *The Stubblefield Story*. Then as you go downtown, you can tune your car radio to 1340 KHZ and hear a blend of rock, easy listening, and country, and the news "centrally distributed" from WNBS radio. At a certain time the announcer will tell you: "You are tuned to WNBS, 1340 on your radio dial in Murray, Kentucky, the birthplace of radio."

Fessenden at Brant Rock

Although Nathan Stubblefield's wireless telephone worked, someone had yet to master the ability to transmit voice beyond very short distances. Some of the most productive experiments toward this goal were carried out in Pittsburgh, Pennsylvania, in 1901. Reginald A. Fessenden (Figure 2–10), a Canadian by birth and a professor at the University of Pittsburgh, worked to improve both the detection of electromagnetic waves and a means by which a human voice could be placed "piggy back" on electrical oscillations and sent into the atmosphere.[31] He first developed an improved detector, which would later be called the *heterodyne circuit.* Fessenden applied for patent papers for the improved circuit in 1905. Simultaneously, he continued to improve the transmitting and antenna systems for wireless. The excitement of a breakthrough into reliable voice broadcasting was enough to encourage two Pittsburgh financiers, Thomas H. Givens and Hay Walker, Jr., to put $2 million into Fessenden's work and form, with Fessenden, the National Electric Signalling Company.

Figure 2–10 Reginald Fessenden. With financial support from two Pittsburgh investors, Fessenden applied his earlier work at the University of Pittsburgh to a successful test of long-distance voice transmission in 1906. With a new antenna design, he transmitted signals from Brant Rock, Massachusetts which were received as far away as Scotland and Puerto Rico. (Archives of the University of Pittsburgh)

Fessenden, besides $300 a month in salary, also received stock in the new venture.

The early experiments were conducted on the Chesapeake Bay, then were moved in 1905 to Brant Rock, Massachusetts. Here, the next chapter in wireless history would be written. Continually trying to improve Marconi's original invention, Fessenden constructed a high-power station at Brant Rock and radically altered the antenna design. Instead of the series of umbrellalike wires used in Marconi's experiments, Fessenden constructed an "antenna tower." It stood 420 feet high and was a series of telescopic metal tubes three feet in diameter at the bottom, held in place by supporting guy wires, and insulated at all points from the ground. The result was penetrating signals which beamed through the atmosphere which Marconi's station could not reach. Signals were received in Puerto Rico and at a station in Scotland even during the summer months when static normally interferes with transatlantic broadcasts. These first achievements at Brant Rock were shadowed by later excitement as voice broadcasting moved out of the laboratory.

Alexanderson's Alternator

The problem that continually plagued Fessenden was how to increase the number of transmitted oscillations so that the human voice would be audible. The inclusion of a telephone-type receiving apparatus already had been successful. Marconi had used it to hear the signals from England in his famous Newfoundland experiment, and wireless operators on ships used headphones to listen to messages in Morse code. The secret was to generate enough cycles so that the voice would travel with the signal and not be drowned out by the sound of the current passing through the headphones. To accomplish this, Fessenden enlisted the help of the General Electric Company in Schenectady, New York. There in the GE laboratories, a young Swedish scientist named Ernst Alexanderson (Figure 2–11) was placed in charge of the engineering team assigned to produce the Fessenden alternator. Both trial and error and difficulties in meeting Fessenden's wishes slowed down the project.

First, Alexanderson developed an alternator using a revolving iron core called an *armature*. Fessenden, however, demanded a wooden core, and the work started over. Fortunately for Fessenden, his two Pittsburgh financial backers continued to pour money into the project. Fessenden tried another company, the Rivett Lathe Manufacturing Company in Boston, but their device failed when the bearings burned up at the high speeds necessary to produce 50,000 cycles, the amount Fessenden felt would be needed for voice transmittals. Finally, Alexanderson and the GE team delivered the wooden armature alternator in September, 1906.

Ships within a few hundred miles of Brant Rock, Massachusetts were

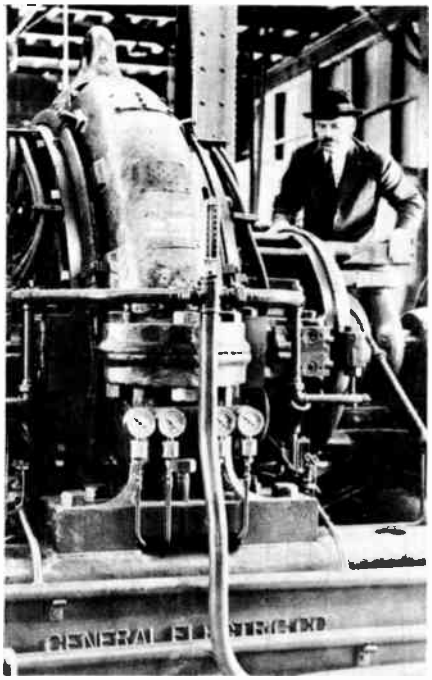


Figure 2–11 Dr. Ernst F. W. Alexanderson, a General Electric engineer who developed the high-frequency alternator that gave America a big edge in early long-distance voice broadcasting. This alternator, one of several developed by Alexanderson between 1905 and 1920, was used to send transatlantic broadcasts from the RCA station at Rocky Point, Long Island. (General Electric Research and Development Center)

filled with crews celebrating the mixed merriment and loneliness of Christmas at sea on that December night in 1906. In the wireless rooms, the operators were on scheduled duty exchanging messages and receiving the food and good cheer of fellow officers when the splitting sound of CQ, CQ came through their headphones. The universal call alerted them that a message immediately would follow. Then, instead of the dit-dah of Morse code came the sound of a human voice. Officers were called to the wireless station to witness the phenomenon. The voice was that of Reginald Fessenden. "O Holy Night" rang out through the cabin followed by the words, "Glory to God in the highest, and on earth, peace to men of good will." Voice broadcasting had reached as far away as Norfolk, Virginia and the West Indies, shouting the world of wireless into a new era.

The Canadian Controversy: Fessenden Is Bankrupt

Many of the early wireless experimenters managed to amass considerable financial gain from the new medium, and even those who at first had lost money later reaped a profit. For Reginald Fessenden, fate had the opposite in store.[32] With the Brant Rock experiments a success, Fessenden's backers wanted to develop some profit potential for the company, which up until now had been devoted to pure research. But Fessenden was at odds with Givens and Walker over a proposal to open a Canadian subsidiary. The Canadian company had evolved from a design on the part of all three men to give Marconi competition in transatlantic broadcasts. Fessenden went to England and made an agreement with the British Post Office in which if his station at Brant Rock could communicate with a station in New Orleans, a distance of about eighteen hundred miles, the British Post Office Department would approve a fifteen-year license for Fessenden's company to establish a reliable communication link between Canada and England.

Fessenden successfully completed the Brant Rock-New Orleans experiments, and then the trouble started. Fessenden, a Canadian by birth and the chief negotiator in the British contract, felt the Canadian subsidiary company should be controlled mainly by himself, the Canadians, and the British. Despite providing the capital for the new venture, to say nothing of the millions already invested, Walker and Givens were not to serve in any position of authority. Naturally, both men objected strongly, and Fessenden resigned and sued, collecting $460,000. The National Electric Signalling Company declared bankruptcy in 1912, and Marconi and his companies were once again the undisputed leaders in wireless communication.

de Forest Gains Publicity

After inventing the audion, Lee de Forest began to experiment with voice communication at the same time Fessenden was developing his hetrodyne circuit and conducting the Brant Rock experiments. Using a high frequency arc to modulate the signal, de Forest succeeded in transmitting a voice across the length of a room during the same year in which Fessenden gained recognition for his Brant Rock experiments with ocean vessels. De Forest was quick to see the potential of voice broadcasting and felt that good publicity would bring investors to his own company. Although voice broadcasts were well known in the United States, they were unknown in Europe. So in the summer of 1908, de Forest traveled to France and conducted demonstrations of radiotelephony from atop the Eiffel Tower to stations about twenty-five miles away.

The European experience whetted de Forest's appetite for more publicity at home. Always an opera buff, the inventor contacted the Metropolitan Opera in New York. He arranged to place a transmitter in the attic and connect it to the microphones on stage in the music hall. Although not very clear by modern standards, the microphones were the new Acousticon models manufactured by the National Dictograph Company.[33] On January 13, 1910, Enrico Caruso's and Ricardo Martin's booming voices bellowed *Cavalleria Rusticana* and *Il Pagliacci* to a small audience listening to receiving sets in New York. A master at gaining publicity, de Forest could rival the likes of Buffalo Bill Cody at obtaining press coverage for a show. The opera broadcasts were no exception. "The newspapers had been tipped off in advance and reporters were listening in at the Terminal Building, 103 Park Row, the Metropolitan Tower station, at the Hotel Breslin, on one of the ships downstream, and at our factory in Newark."[34] Although World War I and patent squabbles would slow the growth of modern radio until the late teens, de Forest's publicity helped to set the stage and arouse the public's enthusiasm for what would occur in the decades ahead.

wireless gains popularity: crystals and hams

Up to this time, the wireless had remained in the hands of the large companies, such as Marconi, and the major users—the Navy in the United States and the Post Office Department in England. That all changed in 1906 with the invention of the crystal radio receiver by General Henry C. Dunwoody. That same year, Greenleaf W. Pickard perfected a silicone crystal detector. These two devices contributed two important words to the wireless vocabulary: "availability" and "inexpensive." Remember, the audion was still being perfected, and vacuum tubes were expensive. Early ads for radio-receiving equipment as late as 1915 ran anywhere from $20.00 to $125.00. For a young experimenter attracted to the lure of wireless, those prices were beyond his or her reach. But by using the silicone crystal and a long, outside antenna, the general public could listen in on everything from opera to Navy broadcasts.

These early experimenters were called *amateur radio operators*, better known today as *hams*.[35] ~~They were primarily of two types,~~ (1) those who were interested in ~~radio to experiment with and test new~~ equipment, and (2) those who ~~wanted to use the~~ new medium to communicate with other people. ~~In each~~ type the spirit of the other was fostered. It was these early, home-town inventors who did much to see radio mature. Although the inventors and the big companies provided capital backing for international expansion, the ham operators were responsible for many of the early developments and experiments aimed at improving radio. In 1909, the first known amateur radio club was formed in New York City. The group started with five youngsters, and their advisor was Reginald Fessenden.

A second organization also acquired members, the Wireless Association of America. Started by Hugo Gernsback, the publisher of *Modern Electrics*, the membership roster jumped from 3,200 in 1909 to 10,000 by November, 1910. The association published the first *Wireless Blue Book*, which listed ninety amateur stations as members. A second *Blue Book* followed a short time later, and *Modern Electrics*' circulation soared to 52,000 by 1911. Sensing a lucrative market, the D. Van Nostrand book publishing company put *Wireless Telegraph Construction for Amateurs* on the bookstore shelves. By now, other radio clubs were rapidly forming, including the Radio Club of Salt Lake City, the Wireless Association of Central California, and the Radio Club of Hartford.

Ham radio was also gaining stature because of its ability to communicate when other systems failed. In March of 1913, a major storm hit the Midwest, knocking out power lines and telephone communication. Ham radio operators, including those at Ohio State University in Columbus and the University of Michigan in Ann Arbor, carried on communication and relayed emergency messages for seven days following the storm. It was this idea of relaying messages that sparked Hiram Percy Maxim, famous as an inventor of an automobile and engine silencer, to form the American Radio Relay League in 1914, an outgrowth of the Hartford Radio Club of which Maxim was a member.

Ham radio has continued to thrive as a hobby and has developed throughout the entire field of wireless communication. When radiotelephony replaced wireless, hams began to chat "in person," but the Morse code remains even today a cherished language of those amateur experimenters. They communicate worldwide using teletype, teleprinters, video display terminals, and television. In cooperation with NASA, relay satellites have been launched for use by hams in international communication.

summary

In chapter 2, we traced the beginnings of wireless from the early work of Henrich Hertz to the successful transmission of voice broadcasting by Reginald Fessenden and Lee de Forest. Hertz's major experiments on the presence of electromagnetic waves took place between 1886 and 1889. Working under the German scientist von Helmholtz, Hertz made the historical discovery while discharging static electricity through two metal coils. Based on Hertz's discoveries, Guglielmo Marconi first transmitted wireless signals over a short distance near his home in Italy. After the Italian government showed little interest in his invention, he traveled to Great Britain where he received financial support from the British Post Office Department. After tests near the Bristol Channel, he successfully received wireless signals from across the Atlantic in 1901.

Marconi continued with his experiments while expanding his corporate interests. Companies began to spring up in many countries, including the Marconi Wireless Telegraph Company Ltd. in England and the American Marconi Wireless Telegraph Company in the United States.

Improvements in the wireless were also made by J. Ambrose Fleming with the Fleming valve, and Lee de Forest with the audion.

It was not long before people started to transmit voice over the airwaves. With the devices that had been developed for telephone communication, scientists came closer and closer to quality voice transmission. A Kentucky farmer named Nathan B. Stubblefield performed short-distance wireless voice transmission. Then Reginald Fessenden developed the hetrodyne circuit. With this improved detector of electromagnetic waves and with the help of a large alternator developed by GE and Ernst Alexanderson, Fessenden transmitted voice in December 1906. After disagreements with his financial backers, Fessenden was overtaken in his quest for what was called radiotelephony by de Forest and others. At the same time, radiotelephony became practical as inexpensive receiving sets using silicone crystal detectors were manufactured and sold. The general public was becoming interested in what was now being called radio, and amateur ham operators talked across city blocks and eventually across continents.

spotlight on further learning

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3

the development of modern radio and television

FOCUS After completing this chapter we should be able to

Trace the development of the pioneer radio stations.

Tell what led to the formation of RCA.

Understand how cross-licensing agreements affected radio's early development.

Describe how commercial or "toll" broadcasting started.

Explain the events that shaped the beginning of early radio networks.

Describe the background and impact of FM broadcasting.

Describe early attempts by Nipkow to reproduce an image using mechanical television.

Explain the later contributions of Zworykin and Farnsworth.

Discuss the FCC imposed "freeze," the battle over color, and the struggle of UHF.

Trace the development and application of modern television technology.

Tell how home VTRs, videodiscs, and games could fragment the television audience.

The excitement of the first wireless signals, the thrill of the first voice broadcasts, and the world of the radio amateur, all came from an era of pioneer spirit and experimental technology. Radio was magic, and people welcomed it with open arms. They could set a black box on their kitchen table, stretch a wire into the evening sky, and pick voices and music right out of the air. There was no need to have it delivered by the paper carrier, no need to walk to the country store to get it. The sounds of presidents, operas, big bands, and sporting events were live and immediate. Needless to say, people wanted all the radio they could get, and the stations that gave it to them grew in stature and power. Some of the earliest stations are still household words, and by learning about them, we can catch some of the spirit of early radio.

the pioneer stations

Much like trying to identify the inventor of radio, it is hard to put a label on the town, the place, or the person responsible for the first broadcasting station.

Basic Criteria of a Broadcasting Station

R. Franklin Smith has established basic criteria for broadcasting stations of modern standards.[1] These are: (1) *A broadcasting station transmits by wireless.* The signals must travel through space using electromagnetic waves. Smith does not consider ETV a form of broadcasting nor closed-circuit, "wired" college stations; (2) *A broadcasting station transmits by telephony.* The sounds of the station should be intelligible to the general listener; (3) *A broadcasting station transmits to the public.* It is distinct from other types of communication such as telephone or telegraph, and such special services as safety, aviation, and marine use; (4) *A broadcasting station transmits a continuous program service.* Smith characterizes this as programming which is interconnected and occurs as a pattern recognizable as a program service; and (5) *A broadcasting station is licensed by government.* In the United States, this would be the Federal Communications Commission.

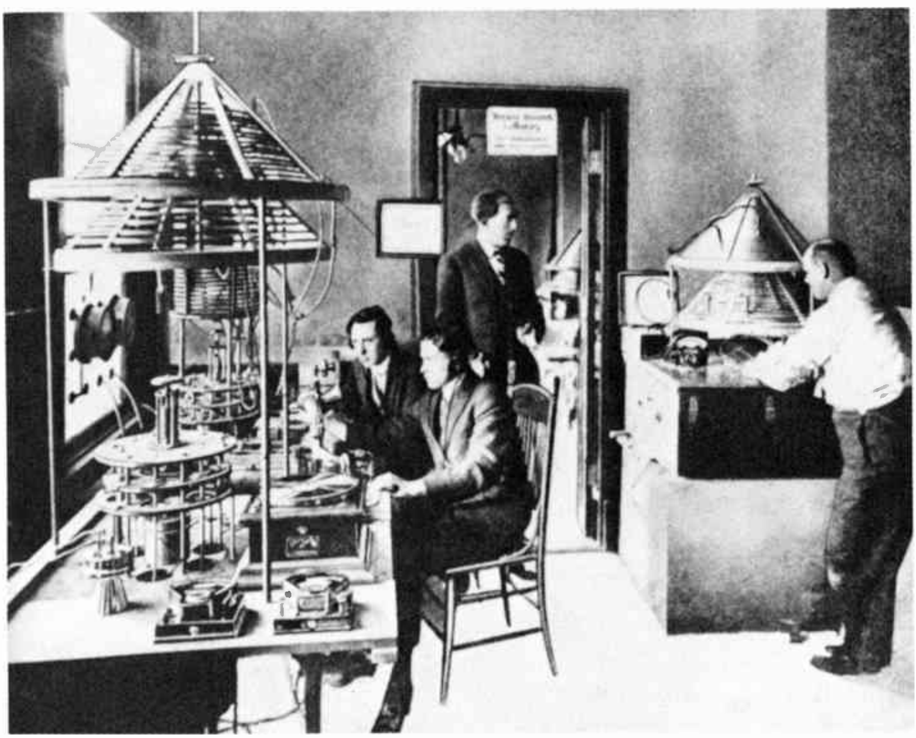
Although these criteria are too limited for our purposes, they are helpful in outlining the history of broadcasting. Even finding the station which first fit the five criteria is difficult since definitions of broadcasting were changing even in the early 1920s. Service, licenses, call letters, and ownership were often short-lived and sporadic.

Still, four stations rank as being important to understanding the historical development of broadcasting. These are KCBS in San Francisco, which evolved over the years from an experimental station located in San Jose, California in 1909; noncommercial WHA at the University of Wisconsin in Madison; WWJ in Detroit; and KDKA in Pittsburgh, Pennsylvania.

Charles David Herrold Begins in San Jose

Professor Charles David Herrold is credited with operating one of the first broadcasting stations in America (Figure 3–1). Others broke the airwave silence before him, but in 1909, residents of San Jose, California could spend a Wednesday evening with their crystal sets tuned to news

Figure 3–1 Charles David Herrold is seen in the doorway of one of his early radio stations in San Jose, California, this one constructed in 1913. He first signed on the air in 1909 and is credited with starting one of America's pioneer radio stations. Others in the picture include (left to right) Kenneth Saunders, E. A. Portal, and Frank G. Schmidt. (KCBS radio, Gordon B. Greb, and the Sourisseau Academy of San Jose State University)



and music broadcast by this owner of the School of Radio in San Jose.[2] For the school, the radio station was its medium of advertising, advertising which was aired more than ten years before KDKA in Pittsburgh and WWJ in Detroit began regular programming. A classmate of Herbert Hoover at Stanford, Herrold constructed a huge umbrellalike antenna in downtown San Jose. From the Garden City Bank Building, the wire structure hung out in all directions for a city block. Although it was a far cry from the eastern giants that could carry football games and political speeches, the little San Jose wireless station became one of the famous firsts in the broadcasting industry.

After 1910, the station handled regularly scheduled programs with operators on regular shifts. Even Herrold's first wife, Sybil M. True, had an air shift and was one of the earliest female disc jockeys.[3] She would borrow records from a local store and play them as a form of advertising. When listeners went to the store to purchase the recordings, they would register their name and address, giving the station an indication of its extent and influence. The California station gained national recognition at the Panama Pacific Exposition in 1915. When Lee de Forest spoke in San Francisco in 1940, he credited Herrold's station as being "the oldest broadcasting station in the entire world."[4]

WHA, Madison, Wisconsin

WHA ~~traces~~ its inception all the way back to 1904 in the physics laboratory at the University of Wisconsin where Earle M. Terry (Figure 3–2) worked as a ~~graduate student pursuing a Ph.D.~~[5] Graduating in 1910, he stayed on as an assistant professor, and in 1917, with the help of colleagues and assistants, he began experimental broadcasting of voice and music. The equipment was makeshift, and the three element tubes were not the sturdy successors of the 1920s. Instead, they were a mixture of creative craftmanship, hand-blown glass, and immense frustration, especially when they burned out.

By 1922, station 9XM had been legitimized by the Department of Commerce with a ~~license and the~~ new call letters WHA. The same year, Professor William H. Lighty (Figure 3–2) became WHA's program director, developing the station into one of the first "extension" stations responsible ~~for bringing universities to the public with~~ everything from news to college courses. Major programming also made great strides by featuring the University of Wisconsin Glee Club, regular weather and road reports, farm and market reports, symphony broadcasts, and the famous Wisconsin School of the Air.

To aid listeners, Professor Terry taught them how to build their own radio sets. He even distributed some of the raw materials free of charge. The radio rage of the early twenties caught many of the large equipment

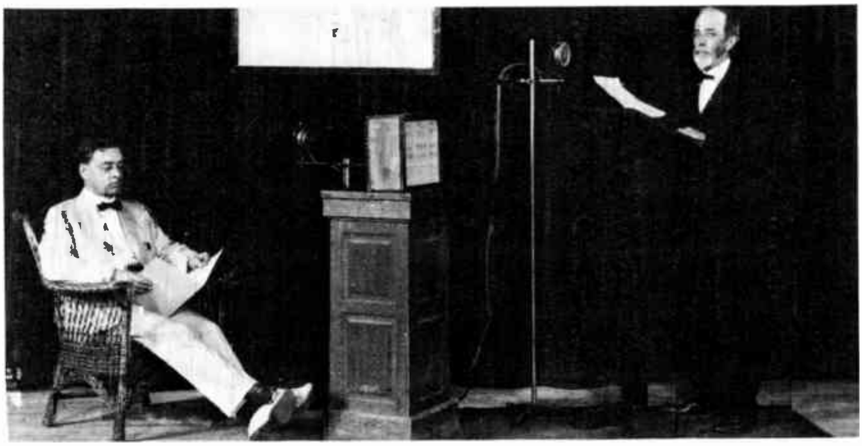


Figure 3–2 Professors Earl M. Terry and William H. Lighty in an early studio of WHA radio at the University of Wisconsin, Madison. (University of Wisconsin)

manufacturers unprepared. Loudspeakers had not yet replaced the earphone, and Professor Terry's demonstrations of amplified radio reception made their first appearance in the Wisconsin exposition hall.

Meanwhile, WHA's farm and market reports and weather broadcasts were being picked up by the newspapers, and weather forecasting stations were using WHA data to aid predictions as far away as Chicago. Letters continued to pour in from listeners as far away as Texas and Canada. WHA has since been joined by WHA-FM and WHA-TV. At the University of Wisconsin in Madison, a historical marker reads: "The Oldest Station in the Nation . . . the University of Wisconsin station under the calls 9XM and WHA has been in existence longer than any other."

WWJ and the Detroit News

After leaving the historical marker at the University of Wisconsin, you can travel east around Chicago and the tip of Lake Michigan to another pioneer station still operating—WWJ in Detroit.[6] When broadcasting was still in its infancy, some forward-thinking newspaper publishers realized that it would be better to reap some of its profits rather than always to compete against it. William E. Scripps of the *Detroit News* had such a vision. Presenting the idea to his colleagues, they appropriated money to construct a makeshift radiotelephone room on the second floor of the Detroit News Building.

At 8:15 P.M. on the night of August 20, 1920, an Edison phonograph played two records into the mouthpiece of the de Forest transmitter, and probably no more than one hundred amateur operators heard the signal.

No advance warning gave a hint of the trial broadcast; no publicity draped the pages of the *Detroit News.* Everything worked perfectly, and the staff began preparations for the next day's broadcast of a Michigan election. When the election returns began to trickle in, it was the radio, not the newspaper, that first brought them to the public. Like a proud parent doting on a child's accomplishments, the September 1 issue of the *News* reported: "The sending of the election returns by the Detroit *News* Radiotelephone Thursday night was fraught with romance, and must go down in the history of man's conquest of the elements as a gigantic step in his progress."

The early programming of WWJ, originally licensed under the call letters 8MK, reflects much of the same programming that other early stations tried, experimented with, and sometimes nurtured into long-running popular fare. The election returns were supplemented the following day with a sportscast, a preview of the World Series on October 5, and WWJ's reports of the Brooklyn-Cleveland match-up. Returns of the Harding-Cox election were heard on November 20, 1920, the same election returns that later became KDKA's claim to the "first station" honor.

So important was music, that WWJ organized the sixteen-piece *Detroit News* Orchestra expressly for broadcast use. It also expanded its studios to auditorium proportions which were described as "magnificent" with perfect acoustics, two-toned blue walls, and a white ceiling with a silver border.

The latest equipment took WWJ's news microphone onto the road and into the air. A single engine prop aircraft with NEWS painted in big letters on one wing was equipped for direct broadcast, and a news and photographic unit thus became one of the first "mobile units" (Figure 3–3), now a common element of radio stations in even small communities.

With all of these early credits to its name, it is not surprising that on the front of an antique microphone illustrating the promotional literature of WWJ reads the inscription: "WWJ RADIO ONE, WHERE IT ALL BEGAN, AUGUST 20, 1920."

KDKA at East Pittsburgh

Station KDKA also established its place in broadcasting's history in 1920.[7] The story of KDKA's begins with Dr. Frank Conrad (Figure 3–4), the assistant chief engineer at the Westinghouse Electric Plant in East Pittsburgh, Pennsylvania, who constructed a transmitter licensed in 1916 as 8XK. After the World War I ban on nonmilitary uses of radio was lifted, Conrad began his experimental programming. Through an arrangement with a local record store in the nearby community of Wilkinsburg, Pennsylvania, he received records in exchange for mentioning the name

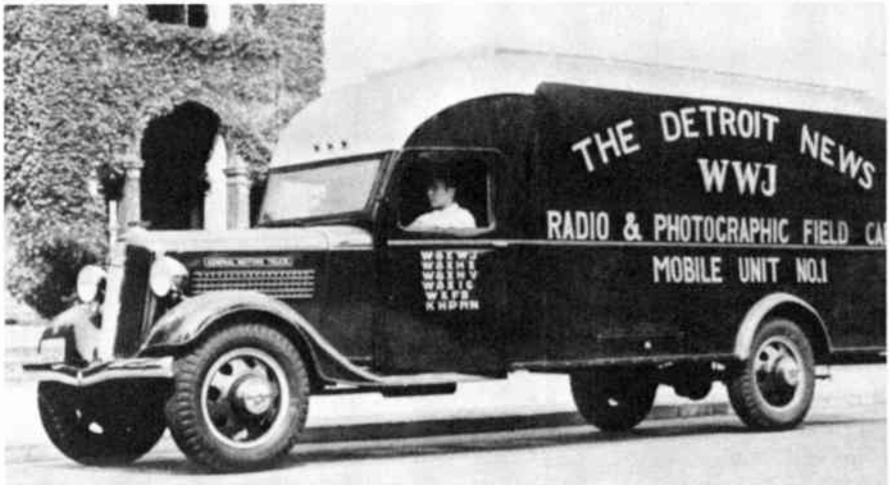


Figure 3–3 A broadcasting station, photographic dark room on wheels, and a newspaper office is how the *Detroit News* described this early mobile news unit. (WWJ and the *Detroit News*)

Figure 3–4 Dr. Frank Conrad, who conducted the experimental work that led to the establishment of KDKA radio. The station began broadcasting on November 2, 1920. (KDKA)

of the store. Its popularity grew so rapidly that Horne's Department Store in Pittsburgh ran an ad for inexpensive receiving sets.

To H. P. Davis, a Westinghouse vice president, the ad was the inspiration for a license application with the call letters KDKA, granted on October 27, 1920. A month later, the new call letters identified the station as it sent Harding-Cox election returns to listeners with amateur receiving sets and to a crowd gathered around a set at a local club. The crowd called for more news and less music, and KDKA's mail reported receiving the signals even at sea. The success of the broadcast gained widespread publicity, overshadowing WWJ's similar efforts, because KDKA had official call letters. Mor~~eover, the combination of~~ a publicized event coupled with a major effort to ~~get receivers into the ha~~nds of the public made the KDKA broadcast an ~~historical milestone~~.

For Westinghouse, manufacturing receivers was its definition of "commercial" broadcasting. Addressing an audience at the Harvard Business School, H. P. Davis remarked: "A broadcasting station is a rather useless enterprise unless there is someone to listen to it. . . . To meet this situation we had a number of simple receiving outfits manufactured. These we distributed among friends and to several of the officers of the company."[8]

As the popularity of the station grew, so did the staff, and when a Westinghouse engineer walked into the transmitting shack, he became the first full-time announcer in radio. Harold W. Arlin's (Figure 3–5) experiences were quite a change from his duties as an electrical engineer. During his career he introduced to KDKA's listeners such famous names as William Jennings Bryan, Will Rogers, Herbert Hoover, and Babe Ruth.

Today, clear-channel, 50,000-watt KDKA can be heard over a wide area of the northern hemisphere during late night periods and with good atmospheric conditions. If you are traveling in the Pittsburgh area, you might even pass the former home of Dr. Frank Conrad in the suburb of Wilkinsburg where a plaque reads: "Here radio broadcasting was born. . . ."

RCA is formed

Although it may seem as though the pioneer stations and their owners were to become the corporate giants of broadcasting, by 1920, a new worldwide corporation was already operating and had the blessing of the United States government. It would soon become a giant not only in broadcasting but in other communications interests as well. The company was the Radio Corporation of America (RCA). Its beginning is full of international intrigue, skilled corporate maneuvering, presidential politics, and even the United States Navy.

Figure 3–5 Harold W. Arlin, who became KDKA's first full-time announcer. Besides introducing many well known personalities to KDKA listeners, he is also credited with broadcasting the station's first play-by-play football game. (KDKA)

The play begins at the close of World War I when the United States still had control of all wireless communication. The ~~thought~~ of turning a major share of the ~~American wireless interests back~~ to Marconi was more than President ~~Woodrow Wilson wanted to do.~~ After all, the Marconi Company was still substantially British in influence if not in stock ownership. Communication and transportation were now realized as important keys to world international power. Great Britain had a network of cable systems in Europe and the United States, and its shipping industry and strategic location had an edge on transportation. Although not necessarily a threat, the British were at least to be treated with caution. President Wilson was also a fan of radio in his own right, having seen the benefits of his famous Fourteen Points spread throughout Europe by an American station using the huge General Electric alternator of Ernst Alexanderson.[9]

Government Attempts at Keeping the Alternator

In 19~~18, two bills were~~ introduced in Congress, both designed indirectly to bring ~~wireless under control. Although~~ seemingly harmless at the time, they suggested the use of technical ~~school radio~~ stations for experimental use but failed to mention anything about the amateur or "ham" stations.

Although the legislation had the support of President Wilson and the Department of the Navy, neither counted on the lobbying efforts of the amateurs. In chapter 2, we learned of the mushrooming popularity of radio and the growth of the amateur organizations. When World War I began, and the government took control of broadcasting, it was silence for the hams, and their equipment did little more than collect dust. Now, with all of their pent-up enthusiasm of going back on the air, their exciting tales of radio's war escapades, and a flood of war-trained operators wanting to continue their experiences as hobbyists, the legislation did not have a chance. Scathing attacks on the bills even claimed that they would prohibit the youth of the country from participating in investigation and invention.[10] Finally, the bills were tabled, permanently.

Bullard, Young, and Sarnoff

The next scene cast the General Electric Company, President Wilson, and Admiral William H. G. Bullard in leading roles. For GE, the war was a period of considerable government support, especially for its Alexanderson alternator. When the war ended, the company faced serious layoffs because of the lack of government contracts. Although trading patriotism continued during the hostilities, an end to the conflict meant GE was free to trade with any company it chose. By coincidence, that trading was about to begin with the British Marconi Company. But President Wilson wanted the new technology of radio to remain in American hands. Although the details of the conversation are unclear, we know President Wilson at least spoke to Admiral W. H. G. Bullard (Figure 3–6), chief of Naval Operations Service, about keeping the Alexanderson alternator on home ground.[11] Bullard then took it upon himself to speak to General Electric's general counsel, Owen T. Young (Figure 3–6). Whatever persuasive arguments Bullard used, he managed to convince Young and GE to take the giant leap to form a new, all-American company in the wireless business.

In the tradition of people known for significant corporate maneuvers, Owen T. Young managed to coordinate an international negotiation that formed not only the Radio Corporation of America, but also facilitated the purchase by RCA of the American Marconi Company. GE also bought the stock of the American Marconi Company that was owned by the British Marconi Company. The new corporation had American directors and stipulated that no more than 20 percent of its stock could be held by foreign nationals. For American Marconi, the decision to become part of RCA was a necessity in order to overcome its "British" image in the face of American patriotism. It also needed the alternator to succeed just as much as GE needed customers. As it turned out, the merger maintained the jobs of American Marconi employees and directors.

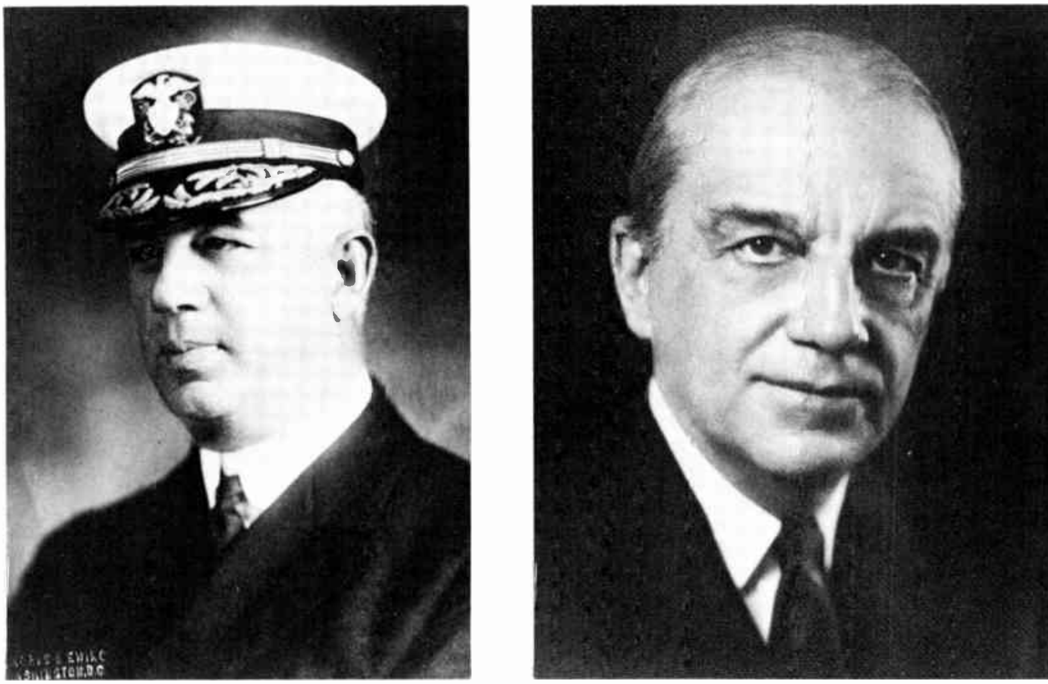


Figure 3–6 Two men important to the early formation of the Radio Corporation of America. Admiral William Hannum Grubb Bullard (left) became the chief intermediary between the U.S. Navy, the White House, and General Electric. Owen D. Young, serving as General Electric's general counsel, was persuaded by Bullard's recommendations and began the maneuvers culminating in the formation of RCA. (Department of the Navy and RCA)

One ~~of the more famous directors was David Sarnoff (~~Figure 3–7). As a wireless operator, ~~he had "worked" the messages~~ from the ships rescuing the survivors of the *Titanic.* Later in 1916, he wrote his boss, Edward J. Nally, at the American Marconi Company suggesting the modern application of radio. In the now famous letter, Sarnoff said:

> *I have in mind a plan of development which would make radio a "household utility" in the same sense as the piano or phonograph. The idea is to bring music into the house by wireless. . . . The receiver can be designed in the form of a simple "Radio Music Box"; . . . supplied with amplifying tubes and a loudspeaking telephone, all of which can be neatly mounted in one box.*
>
> *Aside from the profit to be derived from this proposition the possibilities for advertising for the company are tremendous, for its name would ultimately be brought into the household, and wireless would receive national and universal attention.*[12]

David Sarnoff, named ~~commercial manager of RCA when the~~ merger took place, later ~~headed the corporation~~.[13]

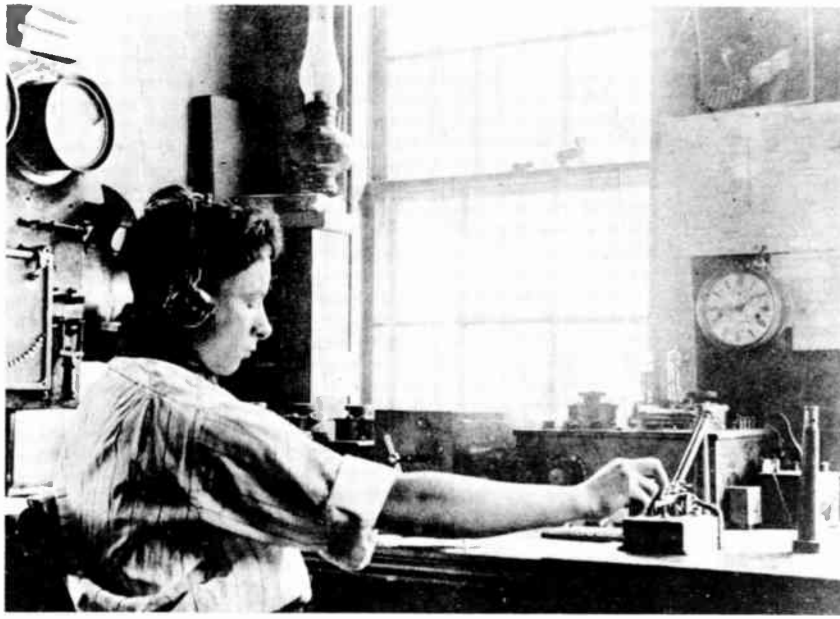


Figure 3–7 David Sarnoff taught himself Morse Code and landed a job with the American Marconi Company as a wireless operator for the station at Siasconset on Nantucket Island. (RCA)

patents, cross-licensing, and competition

KDKA's experiments and their accompanying publicity put the major corporations in wireless communication into a small turmoil. The giants of RCA, GE, and American Telephone & Telegraph had entrusted their futures in a joint block of power that would effectively, if not completely, control the development of radio. But to the triumvirate, the vision had been marine communication and radiotelephony, not the communication KDKA created with its November, 1920 demonstration. Now the memo of David Sarnoff that originally went politely unheeded took on new significance. Perhaps there was money to be made from using broadcasting for mass appeal. The empire that Owen T. Young had built already had acquired allies in GE and AT&T—each had previously acquired important broadcasting patents which the three now shared by agreement.

Sharing the Discoveries

Some of the earliest patents belonged to Lee de Forest. The audion, which was the forerunner of a whole series of improved vacuum tubes, was the most important link to the future of communication, at least in the way AT&T saw it. In 1913, AT&T began buying de Forest's patents to the vacuum tube and then worked with their own engineers to improve the device. By 1915, using the latest equipment, including German-manufactured vacuum pumps to suck the air out of the tubes, the company perfected the first commercially successful device (Figure 3–8).[14] AT&T used it for the first transatlantic telephone call.

As we learned in chapter 2, the courts ruled that the audion infringed on the vacuum tube invented by Ambrose Fleming and that Fleming's patents belonged to the American Marconi Company. Yet war has its peculiar benefits, and breaking this AT&T-American Marconi conflict was one of them. The United States government stepped in and called for all companies to forge ahead as part of the war effort; thus all became immune from patent infringement suits.

The demand for vacuum tubes also involved GE and Westinghouse. Each had the capacity to manufacture light bulbs. The equipment that could suck air from a light bulb also could perform the same task in manufacturing vacuum tubes.[15] General Electric, as we learned, also had the Alexanderson alternator.

So for the duration of World War I, everyone worked in harmony, each cooperating with the other, but each with an important part of the pie that could be reheated after the war ended. When it did, each had

Figure 3–8 The first commercially successful vacuum tube developed in 1915. (AT & T Co.)

something the other needed. Thus for the future of radio, it was advantageous for RCA, GE, and AT&T to enter into a complex arrangement of cross-licensing agreements, permitting each to share in the developments of the others but clearly dividing the way in which radio would be marketed to the public.

Armstrong's Superhetrodyne: Westinghouse Asset

Westinghouse, meanwhile, had been scrambling to compete with the RCA-GE-AT&T alliance. It acquired the patents to a new type of circuitry invented by a graduate student at Columbia University, Edwin H. Armstrong (Figure 3–9). While Armstrong was serving in France in World War I, he became interested in finding a way for antiaircraft guidance systems to home in on the radio waves emitted by aircraft engines.[16] Although his invention never aided the war effort, it did spark the development of the *superheterodyne circuit,* an improvement on Fessenden's heterodyne circuit. The superheterodyne changed the frequency of incoming radio waves, amplified them, then changed them to an audible signal. Westinghouse, just a month before the November 1920 broadcast, shrewdly bought the Armstrong patents and also some held by Michael Pupin, a Columbia professor who had worked with Armstrong, permitting Armstrong to use his laboratory and financing some of Armstrong's work.[17]

When KDKA showed its stuff, Westinghouse was invited to become the fourth member of the RCA-GE-AT&T alliance. Still another com-

Figure 3–9 Edwin H. Armstrong, who developed the superhetrodyne circuit and later, a successful frequency modulated (FM) transmission system. (Columbia University)

pany, United Fruit, joined because of its patents on crystal detectors. Thus under agreements among the big four: (1) GE and Westinghouse would manufacture radio parts and receivers; (2) RCA would market and sell them; and (3) AT&T would make, lease, and sell radio transmitters.[18] All of them were free to start their own broadcasting stations, and they did. But the agreements were mostly concerned with wireless telephony and telegraphy.[19]

When the stations did get underway, they signed on fast and furiously. KDKA was only the beginning. More and more amateurs with numbered-prefixed call signs applied and were granted licenses to operate broadcasting stations in the same fashion as KDKA. Westinghouse did not stop with that Pittsburgh station; it was not long before it signed on WBZ in Springfield, Massachusetts; WJZ in Newark, New Jersey; and KYW in Chicago, later assigned to Philadelphia. WJZ was sold to RCA in 1923.

RCA started its own station in 1921, WDY in New York. Although it stayed on the air only three months, it did try some innovative programming, including a remote broadcast from the New York Electrical Show featuring Metropolitan Opera star Ann Case (Figure 3–10).

Figure 3–10 An early remote broadcast from WDY's improvised studio at the New York Electrical Show of 1921. Standing (left) is Major J. Andrew White, WDY program manager, and Ann Case of the Metropolitan Opera. Opera singers often were used in early experimental broadcasts, not only because of their popularity, but also because their powerful voices could compensate for the less sensitive microphones. (RCA)

General Electric entered broadcasting by signing on WGY in Schenectady, New York. But of all the stations on the air in the early 1920s, the one to stir the attention of the public and the industry alike was AT&T's WEAF in New York.

toll broadcasting: WEAF

The idea of ~~commercial broadcasting~~ was developed at AT&T on June 1, 1922 with the licensing of WEAF. WEAF initiated ~~the concept of~~ "toll broadcasting." This meant that ~~anyone wishing to use the station~~ could do ~~so by~~ paying a toll. ~~Sponsoring a program meant buying the~~ entire time ~~segment and using it for whatever purpose desired~~. At first, the idea had few takers. So the station used AT&T personnel as announcers to fill the programming void, one of the earliest being Helen Hann, a member of AT&T's Long Lines Department (Figure 3–11). The first sponsor to try the new toll concept was the ~~Queensboro~~ Corporation of New York which used a set of five short programs over five days ~~to~~ sell real estate.[20] On August 28, 1922, at a cost of $50.00, the Queensboro Corporation's first program began the era of ~~modern commercial~~ broadcasting.

Figure 3–11 WEAF's early studio with Helen Hann, the announcer. (AT & T Co.)

Criticism of Toll Broadcasting

Not everyone thought the idea was good. Arguments against commercial radio started surfacing in the trade press. The *American Radio Journal* suggested three alternatives: (1) have municipalities undertake programs on a civic entertainment basis; (2) charge the public and collect revenues from a large number of "radio subscribers"; or (3) tax the manufacturers of radio equipment, the people who distribute it, and the people who sell it.[21] *Printer's Ink*, the trade journal of early advertising, concluded: "Any attempt to make the radio an advertising medium, in the accepted sense of the term, would, we think, prove positively offensive to great numbers of people. The family circle is not a public place, and advertising has no business intruding there unless it is invited. . . . The man who does not want to read a paint ad in the newspaper, can turn the page and read something else. But the man on the end of the radio must listen, or shut off entirely. That is a big distinction that ought not be overlooked."[22] Despite questionable reviews, advertising revenue gradually dribbled in to WEAF.

Through some political strategy with the Department of Commerce, the station managed to secure a more favorable frequency and extended hours. That in itself was important since stations did not have the protection from interference that they have today. In fact, sometimes three or more stations had to split up the broadcast day on the same frequency with each vying for the audience when the other signed off.

As WEAF attracted more advertisers, AT&T began pouring money into the station, building new studios and the finest equipment Western Electric would manufacture. That fine equipment also became the envy of the broadcasting industry, and when other stations started to request it, AT&T was reluctant to fill their orders. The short-term profit of a transmitter sale was less important to AT&T than the potential of a national advertising medium under the telephone company's control. When AT&T increased WEAF's remote broadcasts, the audience clamored to listen, and when WEAF's competition did make remote broadcasts, AT&T responded financially.

Finally, AT&T concluded that it would be in its best interests to block remote hookups on AT&T lines from its old allies, RCA, GE, and Westinghouse. Resentment, fueled by profits, lit a spark that inflamed the industry. While the other three competitors were scrambling to use Western Union lines for broadcasts, AT&T was arguing that it alone should be permitted to engage in toll broadcasting, based on nothing less than the 1920 cross-licensing agreements which spelled out manufacturing and distribution rights to radio equipment.

As time went on, the stakes grew higher. WEAF's income from its toll venture continued to climb, while hundreds of smaller companies ate away at the profits of RCA, GE, and Westinghouse by manufacturing radio receivers in defiance and sometimes in ignorance of patent rights. It was clear that the future belonged to commercial broadcasting to a mass audience. AT&T even went so far as to collect license fees from some stations before permitting hookups into AT&T long lines. The company also gathered together a group of stations on which an advertiser could buy time separately or as a group. The stations, or "chain" as early network broadcasting was to become known, presented a sizeable example of how toll broadcasting could work.[23] Although AT&T was receiving some severe criticism in the press, it continued its toll concept.

Finally, the accusations of infringement on the 1920 agreements elevated into open confrontation, and an arbiter was called in to mediate. The parties agreed to adhere to a final verdict issued by Boston lawyer Roland W. Boyden.[24] Simultaneously, the Federal Trade Commission, apparently completely unaware of the arbitration action, issued a report claiming a monopoly in the radio industry and placed the blame on none other than AT&T, RCA, GE, Westinghouse, and the United Fruit Company.

The Antitrust Issue

The Federal Trade Commission's report was sobering, but the radio allies already had agreed to abide by Boyden's decision. Taking his time in this delicate matter, Boyden finally presented his position to the litigants.[25] His draft opinion which effectively ended AT&T's claim to exclusivity in toll broadcasting caused the telephone company to try an end-run. The AT&T attorneys first leveled a reaction to the draft opinion:

> *We believe that the referee's unavoidably incomplete knowledge of the extremely intricate art involved in this arbitration with his effort to cooperate in the attempt of the parties to work out this situation, have misled him into a radical departure from the contract which the parties actually made, and into conclusions which amount to an attempt to make a new contract for them.*[26]

They then got an opinion from none other than John W. Davis, who had helped draft the Clayton Act, that major piece of antitrust legislation passed the same year that the Federal Trade Commission was formed. Davis argued that if Boyden were correct, then the original cross-licensing agreements of 1920 were illegal and an infringement of antitrust laws. It was a crafty move on AT&T's part, effectively suggesting that it did not have to agree to the arbitration because the agreement was illegal in the first place.

With all the turmoil, AT&T was still very conscious of public opinion. An image of waging open warfare to gain control of broadcasting was something it did not want to acquire. The next scene would see the power structure of American broadcasting change dramatically.

Whether RCA either realized AT&T did not want to begin battle, or decided it was time it went into toll broadcasting is open to speculation. Undoubtedly, both thoughts crossed the mind of David Sarnoff as he and other RCA officers watched AT&T organize its broadcasting interests into a separate corporation in May, 1926 and call the new subsidiary the Broadcasting Company of America. At RCA, a similar move was afoot as the RCA broadcasting interests were consolidated in September, 1926 into a company called the National Broadcasting Company. Shortly thereafter, for the sum of $1 million, WEAF became the property of RCA, which was eventually consolidated into WJZ, which RCA had previously purchased from Westinghouse.

NBC had been successfully launched, and for AT&T, the future forecast a healthy income from fees paid by broadcasters to use long lines for remote and network broadcasting. It also lifted the weight of negative public opinion from AT&T's shoulders. Although it might have won the court battles and the arbitration, and even survived the wrath of the Federal Trade Commission, AT&T felt comfortable with its network of "wires," letting NBC shoulder public opinion on the new "national network." In a major display of public pronouncement, NBC advertised its new venture in newspapers with a promise of "better programs permanently assured by this important action of the Radio Corporation of America."

NBC's Red and Blue

NBC operated two basic networks as part of its nationwide coverage plan. The Blue network served some stations exclusively as did the Red network, and a number of the stations had the option of drawing programming from either. Although still consolidated under NBC, the flagship station of the Red network was none other than WEAF. The Blue network chose its old rival WJZ. It is not surprising that the rivalries continued with each attempting to outdo the other. In 1932, NBC executives began to consider a separate status for the Blue network, having it operate even more competitively with the Red. One of the executives to conceive the idea was Mark Woods (Figure 3–12) later to play a key role in ABC's development. Things remained the same at the Blue until 1939 when a separate Blue sales department was established, followed by other departments separate from the Red network. Undoubtedly, an impetus for the changes came with the Federal Communications Commission's announcement in 1938 that it was planning a full-scale inquiry of network broadcasting.

The FCC's Report on Chain Broadcasting

Out of the inquiry came the FCC's 1941 *Report on Chain Broadcasting*. Among other things, it was critical of NBC's interest in talent management. This interest developed early in 1931 when, because of its need for talent, NBC acquired a 50 percent share of the Civic Concert Service, Inc. to complement an artists' management division of the company. Increasing its share in the Civic Concert Service until it owned it, the network became the target of conflict-of-interest charges by the FCC. The *Report* stated: "As an agent for artists, NBC is under a fiduciary (hold in trust) duty to procure ~~the~~ best terms possible for the artists. As employer of artists, NBC is interested in securing the best terms possible from the artists. NBC's dual role necessarily prevents arm's-length bargaining and constitutes a serious conflict ~~of~~ interest."[27] Criticism of the artists' service was only part of the scrutiny. The *Report* also examined NBC's growing interest in its transcription business, which included recordings for libraries and other services.

When the FCC concluded its investigation, it reported that stations could not be bound by exclusive network contracts prohibiting them from airing programming from other networks; ~~network contracts~~ were to be for periods of one year; and stations ~~were to be the sole~~ determiner of ~~programming, that right not to be delegated to the~~ networks. The most important statement, however, hit at the very heart of NBC's dual network concept: "No license shall be granted to a standard broadcast station ~~affiliated with a network organization which~~ maintains more than one ~~network."[28] Seasoned veteran David Sarnoff, now president~~ of RCA, set the ~~wheels in motion to protect RCA's investment. He~~ immediately ~~organized the Blue network as a separate corporation.~~ The action was an attempt: (1) at least temporarily to pacify the FCC, and (2) to get an accurate reading of exactly how much the Blue network was worth by creating a separate accounting system. The handwriting was on the wall—Blue had to be sold.

Edward J. Noble Launches ABC

When it became clear that NBC's disposal of the Blue network was inevitable, major industrialists began to consider the jump into broadcasting. They included the Mellons in Pittsburgh, Marshall Field, Paramount Pictures, and Edward J. Noble (Figure 3–13), who had developed a sizeable fortune making and selling Lifesavers candy. A former undersecretary of commerce, Noble ~~in the summer of 1943~~ posted $1 million of Blue's ~~purchase price and made arrangements to~~ pay RCA the remainder from his own ~~pocket and with loans from three~~ New York

Figure 3–12 Mark Woods, who helped to establish the ~~NBC Blue network which became ABC~~ with Mark ~~Woods as its president.~~ (ABC)

Figure 3–13 Edward ~~J. Noble, who used the pr~~ofits of Lifesaver candies to purchase the NBC Blue ~~network. (ABC)~~

ban~~ks.[29] Th~~e FCC, meanwhile, had delayed enforcing the 1941 *Report* to permit the sale of the Blue network in a calm atmosphere that wouldn't depress the price.

On October 12, 1943, the commission announced it was approving the sale of the Blue network to Edward J. Noble.[30] Mark Woods was retained as, president. In approving the sale, the FCC stated the transaction "should aid in the fuller use of the radio as a mechanism of free speech. The mechanism of free speech can operate freely only when controls of public access to the means of a dissemination of news and issues are in as many responsible ownerships as possible and each exercises its own independent judgment."[31]

For Edward J. Noble, the challenge to develop the Blue network was sizeable. World War II was raging, and American business, although geared up for war production, was in a state of uncertainty. A total of 168 stations and 715 employees were now Noble's responsibility. Already on the climb, however, were Blue's credits as an independent organization.

While still part of NBC, the Blue network showed promising opportunities as an investment. It instituted a special daytime-rate package, permitting advertisers to buy at a discount over a series of daytime hours. Another discount package provided savings for advertisers who steadily bought time on more stations to carry their programs. Institutional advertising permitted companies to sponsor one-time programs publicizing important accomplishments. Typical were the famous "Victory Broadcasts" calling attention to the war effort. Noble also inherited the "strip" broadcasts, which permitted companies to sponsor programming over a strip of four to seven evenings per week. Some of the early takers included Metro-Goldwyn-Mayer which sponsored the comic antics of Colonel Lemuel Q. Stoopnagle, heard five nights a week for five minutes a night and carried by 54 stations.[32]

Despite all its recent accomplishments, the Blue network still had not made a profit, and Noble pulled together his own team of experts. He named a New York advertising executive to be vice president of programs. Adrian Samish, in his mid thirties, had had previous stage work and realized the Blue network did not have the big-name talent that was pulling audiences to the other networks. He was also faced with a diehard group of female followers on other networks who lived for the soap operas of sound with their tensions, intrigues, and love affairs. To compete with these, he instituted a series of game shows, and although not setting the world on fire, did provide the Blue with alternative programming.

Working with Samish was Robert Kinter, a former Washington correspondent. As vice president in charge of special events, Kinter at first seemed like a public relations trouble-shooter until he began showing everyone he had a head for management decisions. By the turn of the decade, he was serving as executive vice president, later to be named president of the network.

Noble had formed a separate corporation, the American Broadcasting System, Inc., to purchase the Blue network. On June 15, 1945, affiliate stations heard announcer James Gibbons say, "This is the American Broadcasting Company." The influence of the war effort and the patriotic mood of the country were reflected in Mark Wood's comments about the new name. The name was chosen, he said, "because 'American' so completely typifies all that we hope, and believe, this company will be and will represent to the people of the world. The tradition of independence and of free enterprise, liberality in social philosophy, belief in free education for all and in public service—all of this and much more is inherent in the name."[33]

To some, the words today might be criticized as overstated, but for a nation headed toward victory in global conflict, Woods was appealing to the heart of the hinterland. Patriotism was also present later that same evening, when ABC officially retired the label of "Blue" with an hour-long program titled "Weapon for Tomorrow" discussing the "importance to a democracy of a freely-informed people."[34]

CBS Is Born

When ABC began network broadcasting, it had three formidable competitors—the Red network which later became NBC, and two other networks, CBS and Mutual. CBS can trace its beginnings to January 27, 1927 when a company called United Independent Broadcasters, Inc. was formed to serve the dual purpose of selling time to advertisers and furnishing programs for stations. Acting as the sales arm of United was another company and stockholder, the Columbia Phonograph Broadcasting System, Inc. Sixteen stations were included in the original United network, and it was not long before financial difficulties made the venture less than profitable.

United had devised a plan by which it would pay the sixteen stations $500 per week to furnish it with ten specified hours of broadcasting. But the cost was simply too high, and in the fall of 1927, the Columbia people withdrew from the venture, and United bought the stock. United also changed the name of the organization to the Columbia Broadcasting System, Inc. The network fortunately revised its rate agreement with the affiliate stations, having suffered losses of over $220,000 in its first nine months of operation.[35] The new agreement cut the losses, but it was not until a man named William S. Paley (Figure 3–14) arrived on the scene that things began to look up.

Paley's father owned the Congress Cigar Company which had been one of the sponsors on the old United network. When cigar sales jumped from 400,000 to 1 million per day in six months, radio got the credit. Congress's advertising manager, the owner's son, went to New York with an eye on buying the faltering 16-station network. Taking control of 50.3 percent of the stock, the Paley family entered the broadcasting business.

The growth of CBS is somewhat legendary in broadcasting history. The very next year after Paley assumed control, the network jumped into the black and continues to operate at a profit as one of the largest advertising media in the world. Ten years after Paley arrived, the network grew from 16 to 113 affiliates. In its first year of operation, it sank more than $1 million into programming and moved its facilities to new quarters.[36] Paley himself took an active interest in network programming, personally supervising CBS's coverage of the 1928 election returns. By 1930, CBS was holding its own against NBC and was actively participating in the era of "experimental" broadcasting that characterized early radio. We'll learn more about this later in the chapter.

Figure 3–14 William S. Paley, who guided the corporate development of CBS after his father's cigar company purchased the floundering network in 1928. (CBS Inc.)

The Mutual Broadcasting System

The Mutual Broadcasting System started much in the same way as the United network did except for two major differences.[37] First, Mutual did not enter into agreements to pay unmanageable sums of money to affiliate stations, and second, it started small. Mutual began with four stations—WOR in Newark, New Jersey; WXYZ in Detroit; WGN in Chicago; and WLW in Cincinnati. The four stations agreed that Mutual would become the "time broker" and pay the stations their regular advertising rate, deducting first 5 percent sales commission and other expenses such as advertising agency fees or line charges. It expanded in 1936 when Mutual added 13 stations in California and 10 in New England. In 1938, a regional network in Texas added 23 more stations to the chain. By 1940, Mutual had 160 outlets. Yet the network operated more like a co-op than a profit-making network like NBC and CBS. A special stock arrangement even gave some stations a greater voice in the network's operation as well as in special sales commissions. But unlike United, which had to scramble to stay in business, Mutual grew slowly, making it the third competitor in early network broadcasting.

A system of noncommercial radio stations also developed and we shall learn more about them in the chapter on educational-public broadcasting.

fm broadcasting

Many stepping stones dot radio's path of development. Some of these are milestones, such as KDKA's first broadcast. Others mark decisions made in corporate board rooms, decisions that charted the medium's course. Still others represent developments from inside the laboratory.

Armstrong Applies the Principle

Frequency modulation, changing the frequency of a wave to modulate a signal, was not new to Edwin Armstrong. He had studied it and did not believe the words of his predecessors that FM had no real application to broadcasting. One day while talking with David Sarnoff, Armstrong agreed that a device was needed that would clear the static from radio transmission.[38] To Armstrong, that challenge meant years of research at Columbia, culminating in 1933 when RCA engineers accepted an invitation to witness his latest efforts. Although the equipment worked, RCA was not enthusiastic. Still, it gave him permission to continue the experiments at the Empire State Building. There, with successful tests ranging up to 65 miles, Armstrong was sure FM held the key to revolutionizing radio.

But the vision in RCA's eye was television. Tests had already been successful, and the company was undoubtedly thinking a few years ahead to the public relations splash a television demonstration would make at the World's Fair. Armstrong grew increasingly suspicious of RCA's and Sarnoff's intentions. Deciding not to wait, he launched a lecture tour of his own and demonstrated FM to dozens of audiences across the United States.[39] Selling his RCA stock and receiving encouragement from the Yankee and Colonial networks in New England, Armstrong built his own FM station in Alpine, New Jersey. There, after battling the FCC for a license, he continued his experiments and managed successful broadcasts of up to 300 miles while spending a personal fortune of between \$700,000 and \$800,000.[40] The World's Fair came and went, and Armstrong was left with his fledgling experiments. But even with the thrill of television, FM was beginning to catch on, so much so that on January 1, 1941, the commission authorized commercial FM broadcasting. Although it might have seemed that Armstrong could look his old friend David Sarnoff in the eye with an "I told you so," that was not the case. In 1945, RCA won a victory when the FCC moved FM to its higher frequency, making room on the spectrum for television.[41]

Finally in 1948, after seeing RCA get away without paying royalties on FM sound transmission for TV, Armstrong brought suit. For five years the legal battle went on until Armstrong finally agreed to a settlement.

He died shortly thereafter, reportedly committing suicide. But FM, even with setbacks, corporate lobbying, government tampering, and changed frequencies, continues to develop and win audiences.

Factors Affecting FM Growth

The growth of FM broadcasting can be attributed to ten reasons. *First,* even though it was set back by World War II, the FCC gave FM permission in 1941 for full-scale development which prospered in the brief prewar period. *Second,* the perfection of sound recording gave the public a new appreciation for quality reproduced music, quality that FM could provide better than AM could. *Third,* FM was boosted by the development of stereo sound recording and the corresponding public demand for stereo FM. *Fourth,* the June 1, 1961 decision by the FCC permitting FM to broadcast stereo signals gave FM the ability to supply that demand. *Fifth,* the crowding on the AM frequencies prompted new broadcasters to enter the industry on the FM spectrum. *Sixth,* FCC requirements which gradually eliminated the once common practice of simulcasting the same program on combination AM/FM stations under the same licensee forced licensees to develop the FM stations. *Seventh,* more radio receivers are capable of receiving FM signals.

Eighth of the ten reasons for growth is that FM stations are now presenting a diversity of programming which appeals to a wide range of tastes (Figure 3–15). A research project conducted by Cox Broadcasting Corporation examined broadcast diversity.[42] The research found 21 percent of FM stations programmed contemporary music, more than what AM stations programmed. So the image of FM as devoted mostly to classical music is already outdated. Cox found that "beautiful" music occupied only 6 percent of FM programming. Twenty-four percent of the stations programmed "beautiful" music, 13 percent light music, 9 percent country, 8 percent contemporary, 5 percent soul, and 14 percent "other" formats. *Ninth,* although it is changing, FM has fewer commercials than AM does. *Tenth,* automated programming equipment permits licensees with an AM/FM combination to program the FM station without increased staffing.

FM's growth has been substantial. Cox researchers predict that in 1981 there will be 3,500 FM stations in operation as compared to 4,600 AM stations (Figure 3–16). The same research sees FM as equaling AM in popularity, capturing 57 percent of the total American listening audience (Figure 3–17) in 1981.[43] So the work of Edwin Armstrong, despite his frustrations, did open a new era in radio which has had not only a profound effect on the industry, but also on the radio programming which we receive.

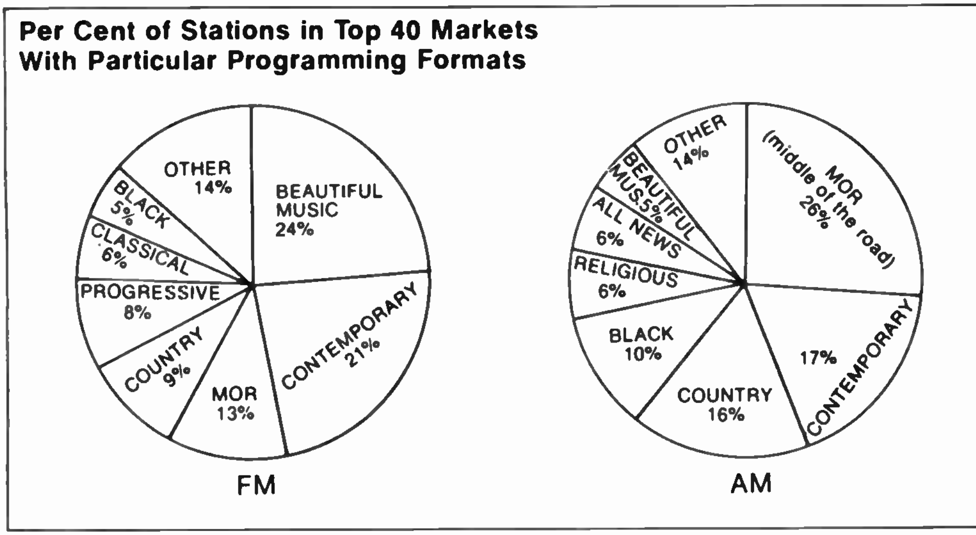


Figure 3–15 (Cox Broadcasting Corporation)

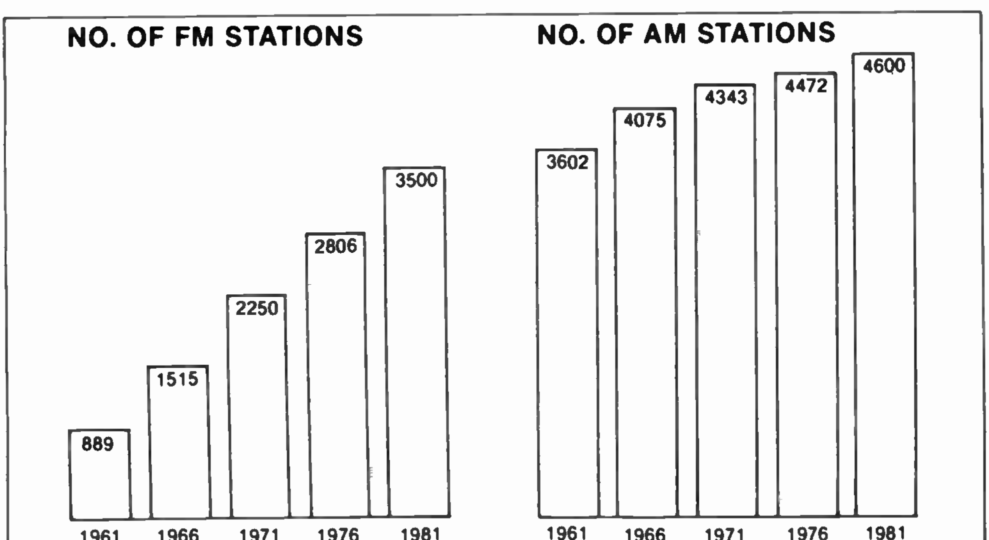


Figure 3–16 (Cox Broadcasting Corporation)

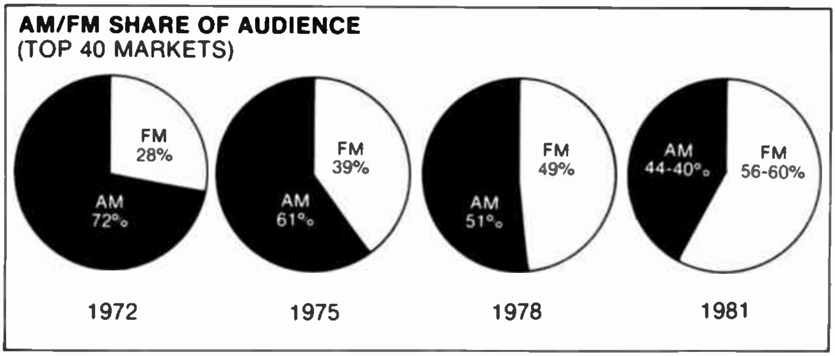


Figure 3–17 (Cox Broadcasting Corporation)

the transistor

The story of the transistor begins in the Bell Laboratories in 1947 when Dr. William Shockley sent a memo to colleagues inviting them to observe an experiment he had perfected using crystals, much like those used in early radio receivers. What Dr. Shockley was experimenting with was the "transistor effect." Using a small silicon crystal, scientists at Bell Labs discovered that the crystal could be made to react to electrical currents in much the same way that the vacuum tube reacted. Dr. Shockley, working with colleagues Walter H. Brattain and John Bardeen, perfected the transistor, early models of which were not much bigger than a grain of sand. Today, scientists have perfected the transistor to the point at which thousands of them can fit onto a tiny chip smaller than the end of your finger (Figure 3–18).

Transistors function in a process similar to a switch controlling an electrical current. The transistor in your portable radio consists of a wafer-thin crystal in three layers. A wire is attached to each of the three layers. One wire is used to detect the radio signal being sent through space. When the signal is detected, it allows current to flow through the transistor in sequence with the incoming signal. By attaching a battery to the transistor, the radio signal can trigger a circuit, releasing current from the battery. Because the current is released in exact sequence to the incoming signal, the transistor permits the signal, through the battery's current, to be amplified tens of thousands of times.

The small size of the transistor revolutionized radio. When its practical applications were realized, the radio receiver could be taken outside the home with no more power than a tiny battery. Radio receivers were suddenly everywhere—on the beach, at the ball game, on picnics. There was a new gift-giving spree as transistor radios became *the thing* to own. We now take for granted the tiny pocket device that can put us in instant

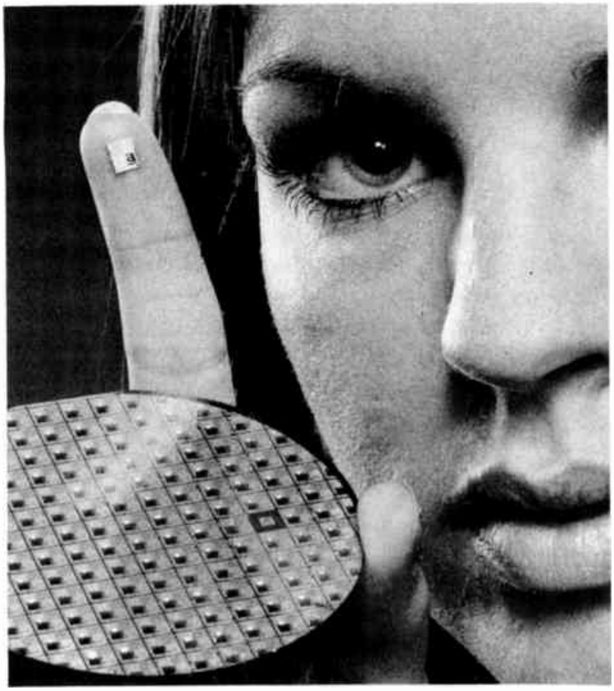


Figure 3–18 The transistor chip on the woman's finger has a circuit capacity of thousands of single transistors. (Rockwell International)

touch with dozens of AM and FM radio stations. F~~or William Shockley,~~ Walter H. Brattain, and John Bardeen, their discovery won them the Nobel Prize in Physics.

reproducing an image

Even before Henrich Hertz had proved the existence of electromagnetic waves, scientists were working to find a way to reproduce images and send them from a transmitter to a receiver. The person credited with the first breakthrough was German ~~scientist Paul Nipkow.~~ As Marconi continued to build his worldwide corporate ties, as the giant American corporations fought over the control of wireless, as the pioneer stations signed on the air, and as the transistor was being developed, television continued through its experimental era to become a mass medium that by the 1950s equaled radio as a mass medium.

Nipkow's Scanning Disc

Paul Nipkow's scanning disc proved that images could be transmitted electrically and mechanically, using a series of wires between the transmitter and receiver. By punching holes in the disc and arranging the holes in a spiral, the revolving disc would enable the holes to scan a picture placed behind the disc. By rapidly changing the picture, the illusion of a moving image could be transmitted over wires. The system worked even in 1884; yet it lacked many components needed to make television a reality. First, the system was mechanical, not electronic. Compared to today's television, it was slow and cumbersome. Second, the wires limited the distance that the image could be transmitted, because stringing wires to many different locations was impractical. Third, the image was unclear because coordinating the scanning disc with the changing pictures still had not been perfected. Experimentation on the scanning disc continued. Ernst F. Alexanderson, inventor of the Alexanderson alternator, continued to work on mechanical television, experimenting with both small and large screen systems. Television technology continued to advance to the point at which it could transmit pictures of crude clarity using high intensity lights. The most famous demonstration of this technique was with the cartoon character, Felix the Cat (Figure 3–19). Perched on a converted phonograph turntable in New York, experimental receivers as far away as Kansas City relayed the revolving Felix, who looked very much like a venetian blind. Two men in the 1920s were to make those experiments obsolete.

Zworykin and Farnsworth

A scientist at RCA and an Idaho schoolboy gave the world electronic television. Working far apart, the two transformed television from a clumsy mechanical device into a sophisticated electronic eye. Vladimir K. Zworykin, who immigrated to the United States from Russia, went to work for Westinghouse in its Wilkensburg, Pennsylvania plant a year before KDKA signed on the air. He asked and received permission from Westinghouse to work on a device that used electrons instead of scanning discs to detect and transmit pictures. In 1923, Zworykin patented an all-electronic television pickup tube called the iconoscope Figure 3–20) which signaled the end of the scanning process. By 1929, he and his research team demonstrated an all-electronic television receiving tube called the kinescope.

But 60-line television was still a far cry from public acceptance. It was this very thought that crossed the mind of a teenager from Rigby, Idaho. Philo Farnsworth, later to become known as the "father of television,"

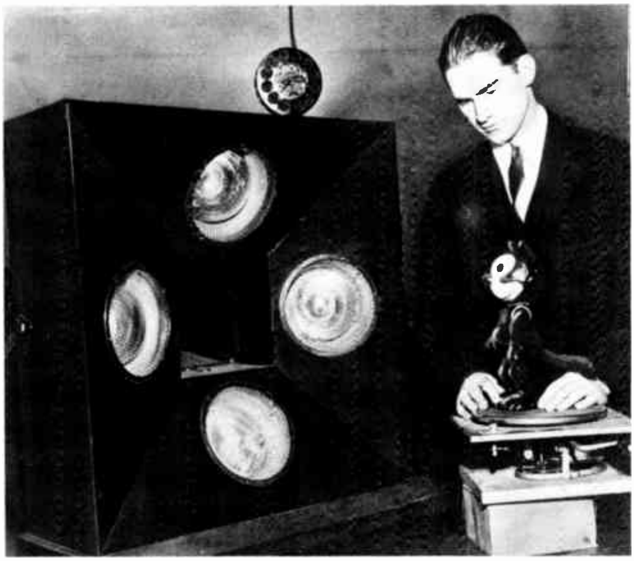


Figure 3–19 In 1928, television was progressing through its experimental era which showed the clarity of a 60-line picture in black and white (left). The television picture was produced by putting Felix the Cat in front of a television camera flanked by high intensity spotlights (right). (RCA)

Figure 3–20 Vladimir K. Zworykin holding his invention, the iconoscope, an all-electronic television pickup tube. (RCA)

first came up with the idea of electronic pickup and scanning systems in 1921 at the age of fifteen.[44] To his science teacher, Justin Tolman, Philo explained the solution to the electronic scanning and pickup problem. Tolman encouraged the boy, as much as could be expected in deference to a fifteen-year-old with an inquisitive mind. By the late 1920s, Farnsworth had formed the Crocker Laboratories in San Francisco, later to become the Capehart-Farnsworth Corporation. In 1930, Farnsworth was asking for permission to experiment on the air with a system which could get a 300-line picture quality.

By 1931, he had provoked Zworykin and RCA's interest enough to entice them to travel to California to view his system. Upon seeing it, Zworykin claimed that Farnsworth had nothing he needed. But RCA quickly realized it was going to have to reckon with the boy from Idaho. Farnsworth, with gall that probably made the corporate giant a bit uneasy, told RCA that it could forget about buying his system. The company would have to rent it in a royalty contract. Finally, after much negotiation, RCA did just that. Later in 1941, Justin Tolman testified in a court suit over patent rights. In the courtroom, he drew the same diagram Farnsworth had placed on his blackboard that day in 1921 in Rigby, Idaho, winning an important patent decision for Farnsworth who would later hold over 150 patents, some common to all television receivers.[45]

The Experimental Era

With both electronic pickup tubes and an improved scanning system, television was ready to make its mark. The first United States station to sign on was W2XBS in 1930, owned by NBC in New York. The following year, an experimental RCA-NBC transmitter and antenna were in operation atop the Empire State Building. At RCA, a committment of $1 million was earmarked for field tests. From these tests came the forerunner of big-screen television as RCA's electron "projection" gun made history by producing television pictures on an 8′ × 10′ screen. RCA-NBC mobile television arrived in 1937. The following year, scenes from the play *Susan and God* were telecast from NBC studios in New York, and RCA president David Sarnoff announced that television sets would go on sale at the World's Fair in 1939.

President Roosevelt opened that ~~World's Fair~~ and became the first president ever seen on ~~television by the general~~ public. The fair-going public flocked to ~~look inside the special television~~ receiver prototype displayed by RCA (Figure 3–21). An 8″ × 10″ screen reflected on the lid kept fair-goers asking questions about how it worked and how they could buy one. The same year, AT&T lines linked an NBC camera at a Madison Square bicycle race to a broadcast transmitter, proving that both wires and airwaves could complement each other in aiding television's growth.

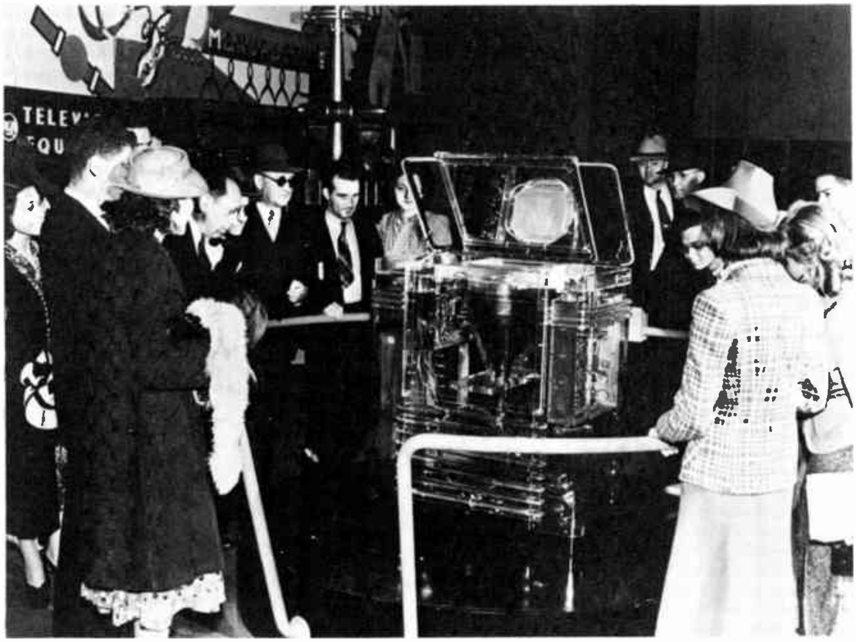


Figure 3–21 A crowd gathers in front of a clear glass model of an early television receiver on display at the 1939 New York World's Fair. The set had an 8″ × 10″ screen reflected on a mirrored cabinet top. (RCA)

By 1941, the FCC realized both the potential and the demands of television, and authorized commercial licensing of television. But the glory was short-lived. As war raged in Europe, the United States needed skilled technicians to work in electronic plants and laboratories at home. There was little use for television. In fact, when the Japanese attacked Pearl Harbor, pushing the United States officially into World War II, it was radio, not television, that brought the sounds of bombs and gunfire to American living rooms. For that dubious distinction, television would have to wait for Vietnam.

The Freeze, UHF, Color

Between 1948 and 1964, three events helped mold television's future. Although not directly related, they occurred somewhat simultaneously and represent an era which is best described as an era of decision and indecision. After World War II was over, the industry once again began to gear up for television. At the FCC, concern was beginning to mount over signal interference from those stations which wanted to begin broadcasting. The bombardment of requests was overwhelming, and the commission instituted the famous television "freeze" of 1948, placing a hold on all new licenses. In 1952 the freeze was lifted. The FCC assigned 12 channels in the very-high frequency (VHF) area (channels 2 through 13) of the electromagnetic spectrum, and 70 channels in the ultra-high frequency (UHF) area of the spectrum (through 83).

In theory, UHF was on a par with VHF. In practice, they were far apart. One big reason was the lack of receiving sets with UHF tuners. UHF simply could not compete in the marketplace. If people did not watch UHF, the UHF stations found it difficult to attract advertising dollars. Finally, in 1964 the FCC began requiring manufacturers to install both VHF and UHF tuners on all television sets. In 1976, the electronics firm of Sarkes Tarzian developed a device called a Uni-tuner which tunes both UHF and VHF channels with the same "click knob."

Although UHF still has a long way to go toward reaching its full potential, its future is beginning to brighten significantly. Many UHF stations are not network affiliated, and expensive network advertising rates are sending many national advertisers to these independent stations. Moreover, a wider assortment of syndicated programming is permitting independent stations to capture a larger viewing audience once reserved for network affiliates.

At the same time as the freeze was taking place and the FCC was deciding how to allocate frequencies, two giants were battling it out over the future of color television. RCA and CBS went to battle over what type of color television system should become the national standard. CBS won the first round when the FCC approved a noncompatible color system for commercial broadcasting.[40] Noncompatible meant the color signals could not be received on sets built for black and white reception. Meanwhile, RCA, which had been developing a compatible system, slapped CBS with a law suit. The appeals went all the way to the Supreme Court which upheld the FCC's approval of the CBS system. CBS, elated over the victory, bought a company called Hytron Electronics and its subsidiary Air King. The new company manufactured receivers capable of picking up the CBS color telecasts. Unfortunately the joy was short-lived. Realizing the importance of compatible color, the FCC in 1952 reversed its decision, and CBS's venture into color television came to an abrupt halt.

television technology

The FCC eventually approved a 525-line resolution system for American television, meaning the picture would be scanned 525 times in rapid succession. It was a giant improvement over Zworykin's initial 60-line system and a considerable improvement over the 441-line system used in Europe before a later 625-line system was adopted.

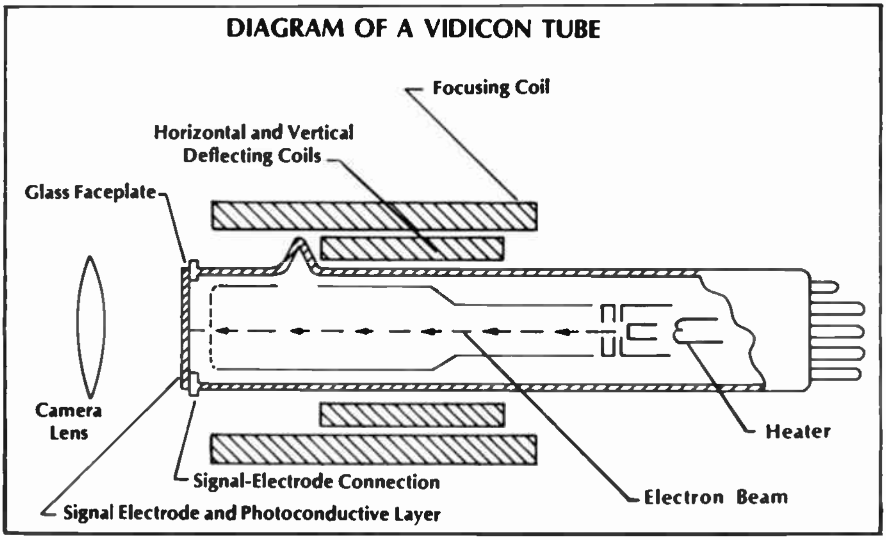
Iconoscopes to Plumbicons

Some of the most important improvements in television technology were in the sensitivity of camera tubes. We already have learned about Zworykin's iconoscope tube and the work of Philo Farnsworth. Although helping picture clarity, the necessity for high intensity lights made working with the iconoscope tube at best uncomfortable. The *orthicon* tube followed, providing improved clarity, and its successor, the *image orthicon*, reduced considerably the amount ~~of light necessary to~~ obtain a clear picture.

After the image orthicon tube came the ~~*vidicon* tube. Even~~ more sensitive, ~~the vidicon paved the way for~~ even greater picture quality. The vidicon is ~~best described as a very sensitive light detector which turns light into electricity.~~ All television since the scanning disc has done this, but the key is sensitivity combined with a high-resolution electronic scanning process. The vidicon is like an electron gun with a heater in the bullet chamber and a lens over the gun barrel. The electrons are fired at the lens and are controlled by a photoconductive layer just behind the lens. When the lens sees a light image, such as a snow scene, more electrons pass through the photoconductive layer to the signal electrode which generates the picture (Figure 3–22).

Improvements on the vidicon tube, especially as applied to color television, continue to be made. A major advancement came with the Amperex Plumbicon® tube which has the ability to capture color images with the sensitivity of the human eye. Experiments in holography, using

Figure 3–22 (*Educational & Industrial Television*)



refracted laser beams, further indicate that three-dimensional pictures are not far away.

Magnetic Recording

Capturing the live image was only part of television's progress. Recording that image for future playback would give the medium a new, flexible, dimension. Thus, film and magnetic recording, later to be called videotape, developed side by side, one using the technology of the other.

Recording television fascinated John L. Baird as early as 1927 when he conducted successful experiments using a magnetic disc.[47] The quality, however, was too unsatisfactory even to try using it for future television recording purposes. Building on Baird's work, researchers spent the next twenty years trying to perfect a video-recording device by using such modes as a combination-television camera and standard 16 mm film, and even large-screen television using 35 mm film, the unsuccessful brainchild of Lee de Forest.

Early color television recording concentrated on combining color clarity with picture clarity. Although most early attempts were marginal, in 1948, Eastman Kodak introduced a 16 mm system developed in cooperation with NBC and the Allen B. DuMont studios. Using a Navy camera, Kodak film, and a CBS receiver, the first "completely successful" recording of color television was made in February, 1950.

The birth of videotape came a year later. The Electronic Division of Bing Crosby Enterprises demonstrated a videotape recorder in 1951, improving the quality a year later. In 1953, RCA demonstrated its version of a videotape recorder. The big videotape breakthrough and publicity, however, came in April 1956 when Ampex engineers demonstrated their videotape recording to a CBS-TV affiliates' meeting. RCA meanwhile, demonstrated a color videotape in 1957, but Ampex was to carry the banner for some years to come. Ampex engineer Charles P. Ginsburg is credited with much of Ampex's success, although a team of engineers worked on videotape development.[48] In 1964, SONY Corporation of Japan introduced a system claiming improved recording head design and simplified operation for black and white recording. Portable videotape units were proving their worth in the mid-1960s with schools and businesses finding especially useful the one-inch, reel-to-reel videotape which could be easily stored and applied to instructional purposes. Next to arrive were the video cassettes. CBS introduced the first video-cassette system called EVR in 1968. The following year, SONY Corporation of America introduced the first color videotape cassette recorder.

Further refinements in videotape storage were developed by CBS under the direction of the late Dr. Peter C. Goldmark. The CBS Rapid Transmission and Storage (RTS) system became operable in 1976, permitting up to 30 hours of programming to be stored on one video cassette. Different programs can be played back from the tape simultaneously over different transmission systems, such as different cable channels.

John L. Baird's research efforts in 1927 ushered in a new era in video recording for everything from full-length movie features to electronic news gathering (ENG).

The Role of Film in Video Recording

Although videotape is currently the center of attention because of its quick playback and reusable tape, film continues to be important. An intermediate film transmitter which "scanned" film was introduced at the Berlin Radio Exhibition in 1932. In 1933, an intermediate film receiver was demonstrated at the same exhibition. Kinescope recording, a quick-developing, film-recording process, was used widely in the early 1950s. In fact, when a nationwide microwave link was completed in 1951, kinescope recording became popular for network transmissions until the conversion to videotape. Even after the conversion, the 16 mm camera continued to be essential to the television news production process and still remains a favorite of many television newsrooms.

Super 8 film also has become a favorite of some broadcasters. Less expensive than 16 mm, super 8 uses one-third more area on the film and an improved camera, thus making it adaptable to many broadcast uses. Professor Ron Whittaker has examined the uses of super 8 film in broadcasting, noting that it can serve broadcasting because: (1) electronic image enhancers can increase image sharpness and provide clarity on television comparable with 16 mm film; (2) advances in the film emulsion process have reduced graininess; (3) super 8 works well in low light conditions; (4) super 8 equipment is still more portable and lighter than ENG equipment; (5) in low light levels, a picture "lag" or "smear" can occur with many electronic cameras, whereas film can handle the greater brightness range; (6) film can be processed in as little as fifteen minutes; (7) the super 8 camera is small and inconspicuous compared to most ENG equipment, which can be especially important when covering such things as civil unrest in which the presence of television cameras can trigger crowd reaction; and (8) stringers can use super 8 cameras easily without much training and at less cost than an ENG setup.[49]

Electronic News Gathering

As refinements continued in videotape recording, bringing higher quality, lighter weight cameras and smaller microwave transmitting and receiving equipment, the stage was set for electronic news gathering (ENG). By the early 1970s, stations were beginning to jump on the ENG bandwagon, some disregarding film altogether. It changed much of the news and public affairs programming as local anchorpersons switched to live coverage of events in the midst of their local television news as easily as they switched to a commercial. Today, we see live pictures from helicopters, boats, lettuce fields, and courthouse steps. We also have become accustomed to live aerial shots of a football stadium from one of the Goodyear blimps (Figure 3–23). The new technology has moved live television far beyond the confines of the television studio.

Changes in Receiver Design

Changes in television receiver design have been as dramatic as the rest of television's facelift. A comparison of the receiver displayed by RCA at the 1939 World's Fair with today's average home set illustrates the considerable difference in both size and design. The transistor's application to television permitted a vast reduction in size, and miniature,

Figure 3–23 Developments in microwave technology have made remote broadcasting commonplace. Pictured is the television camera inside the Goodyear blimp, "Mayflower," focusing on a test picture. Pictures from the blimp are sent by microwave to a receiving dish on the ground and in turn are sent over network distribution systems to local television stations which broadcast the picture to home receivers. (The Goodyear Tire & Rubber Company)

computerlike processing devices called microprocessors further aided its development. Already, pocket televisions are rapidly becoming common (Figure 3–24). Scientists are experimenting with television screens the thickness of a standard picture frame, and using holography, predictions of three-dimensional television receivers are more than mere science fiction. Dick Tracy's two-way wrist TV of comic strip fame may someday be commonplace.

While some manufacturers are working to reduce the size of receivers, others are working to increase the size of the screen. Big-screen television, nothing new, is now becoming popular as a home medium and is especially attractive to restaurants as an inexpensive form of entertainment. Using three projection lenses to display the three primary colors of light in much the same way the set receives a picture, the primary colors are projected onto a large screen which can be viewed from a distance with picture quality equal to that of a standard television receiver.

fragmenting the audience: home vtrs, discs, and games

Videodiscs are also available for home use (Figure 3–25). Looking much like a large record, the discs are played on a recorder that resembles a standard record player. Complete programs lasting an hour and longer can be contained on a disc.

Figure 3–24 Small circuity has made possible portable television receivers the size of portable radios. The set shown measures 4" × 6 3/4" × 1 3/4". A 2" diagonal screen produces black and white images with the detail of larger sets. (Sinclair Radionics, Inc.)

Figure 3–25 Videodiscs could make television programs and other material as easily accessible as phonograph records are now. There still are questions as to what effect this new technology might have on the television viewing audience and on traditional program distribution systems. (North American Philips Corporation)

In addition to these discs, video-cassette recorders like the SONY Betamax permit you to set a special timer and record your favorite program while watching another channel or doing something completely away from the set. Preselected timers automatically turn the recorder on and off, permitting you to spend an evening out and later to return to watch the program you missed.

Television games are becoming as popular as the recorders. Financially within reach of many families and becoming less expensive all the time, video games can turn any home television receiver into a competitive contest. Hockey, football, tennis, racing cars, and airplane dogfights all can be controlled in a penny-arcade atmosphere but with a one-time expense.

All of these new devices worry the television industry. The new technology can play havoc with advertisers, for example. It is difficult to obtain a true reading on how many people watch a television program if some of them watch when the program is first broadcast while others watch on their home video-cassette recorders. Even though a television set may be turned on, no program garners rating points when a video game is under way. The problem has yet to reach serious proportions. However, if these new novelties continue to gain popularity, networks and stations may face competition from more than just each other. Moreover, with inexpensive discs, program distribution systems can completely bypass the local stations. With these thoughts in mind, some companies have entered into litigation to try to stop the growth of home video-cassette recorders and playback systems, claiming infringement on copyrights. The future of these new devices will be determined by technology, law, and public demand.

news applications: subscription tv and teletext

As we approach the end of the twentieth century, television's future may very well be shaped by the adaptation of the medium to new uses for program distribution and information processing.

Subscription-Pay TV

While we think of traditional over-the-air television transmission systems distributing programming to anyone who has a home receiver, growing interest in what is called *subscription TV* or *pay TV* means new potential for the medium. With pay TV, the signal is scrambled as it leaves the station transmitter and descrambled with a special attachment on the home receiving set. The individual pays a monthly fee for the descrambler attachment and can receive special programming such as first-run movies, sports programming, and other programming generally not available to nonsubscribers.

More and more cities are becoming competitive pay-TV markets, with subscribers willing to pay fees substantially above the costs for standard cable services. Chicago, Los Angeles, and Detroit are three examples of pay-TV markets, and fees can run approximately $25.00 per month, with an installation and deposit fee of $100. Major companies such as Time, Inc., see pay TV as having a substantial future and have made substantial investments in pay-TV systems.

Teletext

Also gaining attention is the use of *teletext*, a system where a computer is interfaced with a television transmission system and can send data to home receivers equipped with a special decoder and keyboard. The home viewer, using the keyboard, can select either standard television programming, the teletext signal, or both superimposed. Teletext can send "digital pages" of information using scanned lines of the television picture not visible without an encoder (Figure 3–25). The system pi-

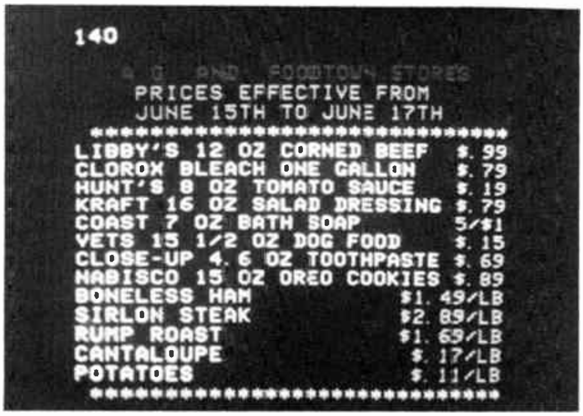


Figure 3–26 "Pages" from the experimental teletext system at KSL-TV in Salt Lake City. *(Courtesy Bill Loveless and KSL-TV)*

oneered in Britain with the operation of the BBC's CEEFAX operation. In the United States the system gained attention after experimental progress was made with a prototype unit installed at Bonneville International Corporation's KSL-TV in Salt Lake City. Much of the work there is under the direction of Bill Loveless, director of engineering for Bonneville.

The information potential for teletext is almost limitless. From grocery lists to newspaper pages, the system promises still new frontiers in communication as television becomes more and more a part of our information society.

While in this chapter we have touched the early history as well as the new technology of broadcasting, the chapters that follow will give us a broader understanding not only of how broadcasting operates but of the social, political, and economic aspects of broadcasting, both domestically and internationally.

summary

When Charles David Herrold started his station in San Jose, California in 1909, it became one of the earliest of a string of pioneer stations. Such names as WHA at the University of Wisconsin, WWJ in Detroit, and KDKA in Pittsburgh were added to the list. The stations expanded in power and in audience and were joined by thousands of others as radio matured.

One of the major developers was the Radio Corporation of America. Formed in 1919 as part of a scheme to keep the Alexanderson alternator in the United States, RCA's direction was charted by former Marconi employee David Sarnoff.

The 1920s were marked by agreements and disagreements among the major radio powers. Although Westinghouse, GE, AT&T, and some smaller concerns joined together to share inventive efforts, they competed in developing commercial broadcasting. AT&T's WEAF attempted "toll broadcasting," and when it tried to monopolize stations' use of the long lines, matters went to court. A corporate agreement resulted, and AT&T went back to the telephone business while the others forged ahead with broadcasting.

NBC, CBS, and Mutual emerged as the major networks. When NBC was required to dispose of half of its dual network concept, the American Broadcasting Company was born. In 1967, the Public Broadcasting Act became the foundation for still another major network, National Public Radio.

New technology has also been important to radio's development. Through the work of Edwin Armstrong, radio gained a sizeable "sound" advantage with FM. The FCC's support of FM, requiring separate programming from AM, and the development of stereo FM broadcasting opened up new possibilities for this area of the spectrum. And just when it was needed, the invention of the transistor by three Bell Lab scientists made radio a portable medium.

Early attempts to reproduce an image, however, used a scanning disc developed by Paul Nipkow. This mechanical process was soon replaced by electronic reproduction. The work of Vladimir Zworykin and Philo Farnsworth gave us the iconoscope television tube and electronic scanning of high resolution, permitting improved picture quality. The early experimental era of television saw station W2XBS sign on the air in New York, followed by a series of breakthroughs in improved television technology.

The first true introduction of television to the American public took place at the World's Fair in 1939. In 1941, the FCC approved commercial television. Then during the television freeze which began in 1948, the commission spent five years deciding frequency assignments and standards for color.

Television cameras, meanwhile, improved from the iconoscope tube to the orthicon, the image orthicon, the vidicon, and the Plumbicon® tube, which is based on the vidicon concept but provides color clarity equivalent to that which can be detected by the naked eye. Magnetic recording of television programs progressed from the early kinescope methods to videotape. Film advanced to super 8 technology. But at the same time, industry people became concerned about the fragmenting television audience caused by such developments as video cassettes, home recorders, videodiscs, and video games. Subscription TV and teletext systems promise new applications for television program distribution and information processing.

spotlight on further learning

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part 2

Basic Technology

4

radio waves and the spectrum

FOCUS After completing this chapter we should be able to

Understand the theory of the electromagnetic spectrum and electromagnetic waves.

Describe how AM and FM broadcasting works.

Explain the difference among FM stereo, quadraphonic, and AM stereo.

Describe how television signals are transmitted.

Describe the paths electromagnetic waves follow.

Understand the allocation of broadcast station operating frequencies.

Explain the differences between directional and nondirectional stations.

Discuss international spectrum management.

It is doubtful if Henrich Hertz could imagine that almost 100 years after his discovery of electromagnetic waves, those same waves would carry messages around the world and even to planets millions of miles away. In this chapter, we shall discover how radio waves travel and how radio and television programs get from the station transmitter to our home receivers.

the electromagnetic spectrum

To understand how broadcast signals are carried between transmitter and receiver, it is necessary to understand the *electromagnetic spectrum*. Consider the spectrum as a "measuring stick" for electromagnetic energy (Figure 4–1). At the lower end of the measuring stick are radio waves. At the upper end of the spectrum we find visible light and X-rays. For our purposes, we shall concentrate on radio waves.

Defining Frequency

What differentiates radio waves from light waves or X-rays? The answer is their *frequency*. You have heard the term used when referring to the dial on your standard radio or perhaps the channels on your CB radio. Two radio stations in the same community operate on different "frequencies" so they do not interfere with each other. When current is applied to the transmitter of a radio station, the antenna emits electromagnetic radiation. This radiation is actually a series of electromagnetic waves, coming one after another. The next time you throw a rock into a pool of water, watch the series of waves which ripple one after the other in all directions from the point at which the rock entered the water. This is what happens when electromagnetic energy travels through the at-

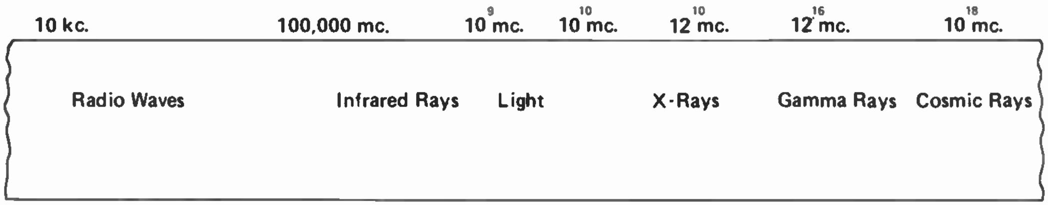


Figure 4–1 The electromagnetic spectrum.

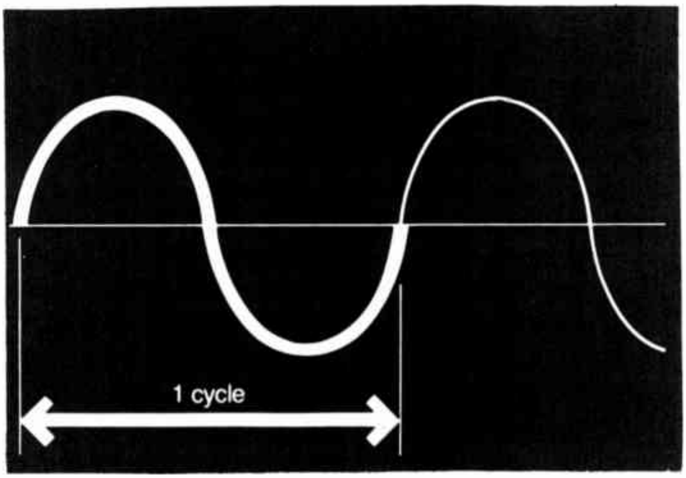
mosphere or the vacuum of outer space. *The number of waves passing a certain point in a given interval of time* is the *frequency*. In broadcasting the waves are *electromagnetic waves*, but for our purposes in this book we will sometimes call them *waves*.

Defining Wavelength, Cycle, and Cycles per Second

The actual *distance between two waves* is called the *wavelength*. For instance, if we take a stop-action picture of the ripples (waves) in our pond and then figured the distance between two ripples, that would be the *wavelength*. Cycle is closely related to wavelength (Figure 4–2). When one complete wave passes our counting point, we have observed one cycle. The "point" can be any geographical location. For instance, if we were watching ripples in a pond we might stand at a certain point on the edge of the pond. The same applies to counting electromagnetic waves. However, electromagnetic waves travel much too fast to count and cannot be seen.

We know that all electromagnetic waves travel at the speed of light, or at 186,000 miles/second. Thus, since we measure the speed of light in miles per second or, using the metric system, in meters per second, the second becomes the commonly used time interval. The number of waves passing a certain point in one second is called *cycles per second*. One thousand cycles per second is called a *kilocycle*, one million a *megacycle*. With this in mind, we can determine the wavelength of radio waves by

Figure 4–2 When one complete wave passes a given point it is called a "cycle." The term "kilocycle" (also called "kilohertz") is used to denote 1,000 cycles, and "megacycle" (also called "megahertz") to denote 1,000,000 cycles. (FCC *Broadcast Operators Handbook)*



simple division. For example, knowing the speed of light is 186,000 miles per second, if 10,000 cycles (10,000 complete waves) pass a given point in one second, the wavelength of each wave would be 18.6 miles (186,000 ÷ 10,000). Now let's figure the wavelength of a higher frequency, 535 kilocycles (535,000 cycles per second). We divide 186,000 by 535,000. The answer is .3477 miles. Since there are 5,280 feet in one mile, we can convert our wavelength to feet by multiplying 5,280 by .3477. The answer is a wavelength of 1,836 feet.

Computing Frequency

Now that we understand cycles per second, we can easily compute frequency. If, for instance, 1,000 waves pass a given point in one second (1,000 cycles per second or one kilocycle), the frequency or location on the electromagnetic spectrum is 1 kilocycle. Similarly, 535,000 cycles per second is represented as 535 kilocycles. On your AM radio dial, that particular frequency would be at the lower end of the dial (Figure 4–3).

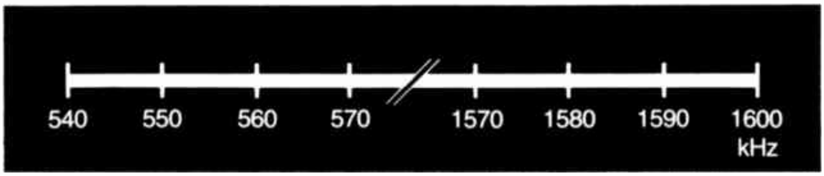
Do not be alarmed if you purchase an AM radio reading 540–1600. Each radio station is assigned 10 kilocycle ranges on the electromagnetic spectrum; thus the station assigned the lowest frequency is assigned 540 kilocycles which permits it to operate between 535 and 545 kilocycles. Some radios, even though capable of receiving 540 kilocycles, begin numbering their dials at 550 kilocycles or abbreviate it as the number 55.

Tuning to a Wavelength

In simplified terms, a radio receiver "counts" the waves or cycles per second to determine a frequency. Your radio does this when you tune from one station to another. Your receiver is picking up only those waves which are being transmitted on the same frequency to which you tune. Thus, different frequencies on your radio dial correspond to different positions on the electromagnetic spectrum.

Figure 4–3 illustrates this concept. At one position on the spectrum is

Figure 4–3 The typical AM radio dial reads from 540 kilohertz to 1600 kilohertz. (FCC *Broadcast Operators Handbook*)



the frequency allocated to AM broadcasting. This represents that portion of the spectrum between 535 and 1605 kilocycles. Progressing higher on the electromagnetic spectrum are citizens' band radio, television, and FM broadcasting. Later in this chapter, we shall examine even higher frequencies of microwaves.

Common Terms: Meters and Hertz

Before going on to our discussion of AM and FM broadcasting, we need to mention two terms: *meters* and *hertz*. In our discussion of wavelengths, we computed the wavelength of 535 kilocycles using miles and feet. You should be aware that international wavelength is based on the metric system; thus, wavelength is figured in *meters*. Although you may find feet and miles easier to use, meters are the common international measure used in broadcasting. The speed of light is 300,000,000 meters per second (186,000 miles per second). A meter is equal to 2.8 feet. Also, in our discussion we used the term cycles to denote a specific frequency on the electromagnetic spectrum. In recent years, the term cycles has been replaced by the word *hertz* (Hz), in honor of Henrich Hertz who discovered electromagnetic waves. Thus, 1,000 cycles per second becomes one kilohertz (1 kHz), and 1,000,000 cycles per second becomes 1 megahertz (1 mHz). Frequencies of 535,000 cycles per second become 535 kilohertz (535 kHz), referred to simply as a "frequency" of 535 kilohertz.

how *am* broadcasting works

Now that we understand the electromagnetic spectrum and how waves are radiated into space, we'll learn how voice and music use those waves to reach radio listeners. We'll begin with AM broadcasting, or that portion of the electromagnetic spectrum which falls between 535 and 1605 kHz.

AM stands for *amplitude modulation*. Amplitude is defined as breadth of range.[1] Modulation means to adjust or adapt to a certain proportion.[2] Now let's apply both of these words to radio waves. Figure 4–4 illustrates an unmodulated radio wave. Now examine Figure 4–5, a radio wave which has been altered by adjusting the amplitude or "breadth of range" of the wave. The wave characteristics of music and the human voice are transformed into the wave, which in turn "carries" them between the transmitter and receiver. Notice that the wavelength, or frequency, remains constant. The change takes place in amplitude, not in frequency. When the wave is adjusted to carry changes in sound, it is said to be *modulated*.

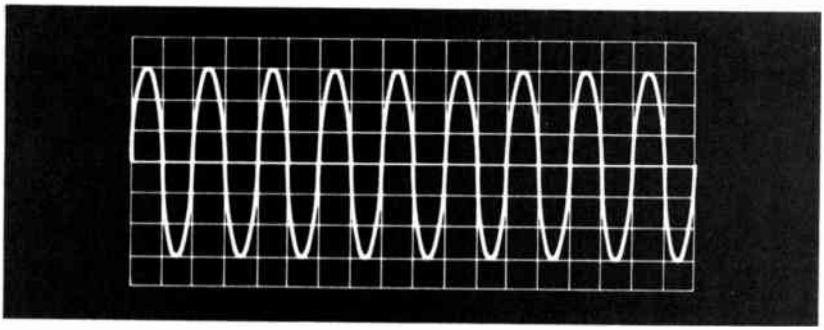


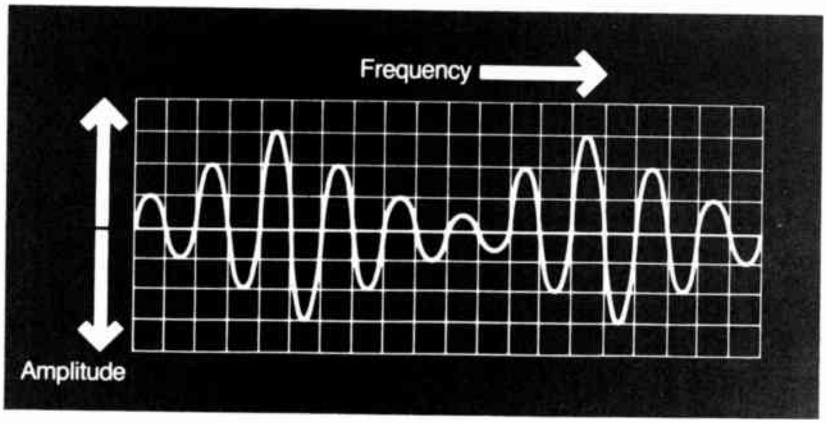
Figure 4–4 Unmodulated wave. (FCC *Broadcast Operators Handbook*)

how *fm* broadcasting works

From our discussion of AM broadcasting, you should have already started to figure out how FM, or frequency modulated, broadcasting works. Instead of changing the amplitude of the wave, we change the frequency, or wavelength. Figure 4–6 illustrates a frequency modulated wave. Notice there is no change in the amplitude of the wave. Instead, the frequency, or wavelength, varies. Different sounds indicate different wavelengths (cycles per second). FM broadcasting to the general public operates between 88 and 108 mHz (Figure 4–7). Each FM station is allocated a width of 200 kHz.[3]

Whether the 200 kHz protection between FM stations will remain is questionable. The FCC has considered narrowing the space allocated to

Figure 4–5 Amplitude modulated wave. Notice the frequency (width of the wave or distance between waves) remains the same, but the amplitude varies. (FCC *Broadcast Operators Handbook*)



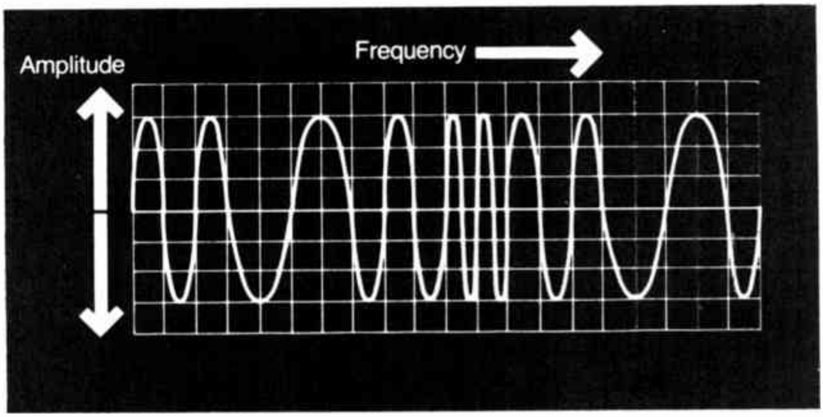
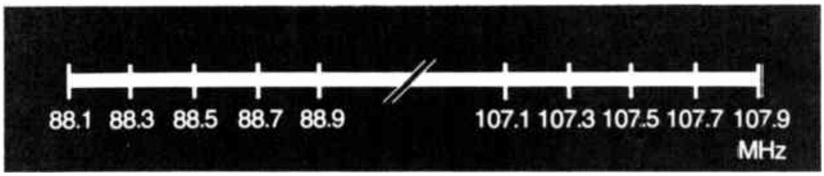


Figure 4–6 Frequency modulated wave. Notice the frequency varies, but the amplitude remains constant. (FCC *Broadcast Operators Handbook*)

each station to 100 kHz to allow room for more stations. Major opposition to the proposal has been voiced by proponents of quadraphonic FM broadcasting, which uses four separate channels instead of the two channels common to FM stereo. Characteristic of this opposition is the editorial opinion of Lou Dorren, whose company, Quadracast Systems Incorporated, developed one of the first quadraphonic systems. Dorren stated: "From the very beginning of FM's history, it has been a medium with special accent on quality. That is how FM grew, and it is really how FM maintains its present market position; it would be folly to relegate it to a lower quantity level." Dorren also contended that "FM has always maintained an advantage over AM in that it could provide multichannel performance. Now, as possibilities for AM stereo are being considered, FM's performance edge for discrete quadraphony should be maintained."[4]

Dorren's arguments are countered by others who want to see as much "room" as possible for the development of future FM stations, expected to outnumber AM stations by the 1980s.

Figure 4–7 The FM radio band goes from 88.1 to 107.9 megahertz. Most FM radio dials are shown in whole numbers without the decimals and read from 88 to 107. (FCC *Broadcast Operators Handbook*)



how *fm* stereo and quadraphonic work

Radio broadcasting has taken three major strides to improve the quality of sound reproduction from the studio to the living room. One was the development of FM broadcasting. The second was the development of stereo FM broadcasting. In the 1970s there has been an interest in quadraphonic, or four-channel FM broadcasting. Let's examine stereo and quadraphonic broadcasting in more detail.

Stereo FM

Within the 200 kHz space allocated to FM broadcasting is ample room for the separation of broadcast signals, permitting the same station to broadcast on *two* slightly different frequencies. In the dual-frequency concept there is room for a special tone sent at the same time, which automatically triggers specially equipped radios to receive the stereo signal. Radios equipped to receive stereo actually have *two* separate receiving systems which, when triggered by the tone, separately receive each of the two frequencies being broadcast by the stereo station. When the tone is not transmitted, the radio still receives the monophonic signal. Many of us have seen a small light flip on in a stereo FM radio receiver when we tune the receiver to a station broadcasting in stereo. This signals us that our radio is tuned to a stereo station, that the station is broadcasting in stereo, and that our receiver is receiving both channels of the stereo system.

Stereo broadcasting has steadily grown in popularity. The reproduction of quality music with the added dimensions of space and depth similar to having the orchestra in your living room has been the main distinction between stereo FM and standard FM and AM broadcasting.

Quadraphonic FM

What added dimensions that stereo broadcasting brought to FM, quadraphonic doubled. With quadraphonic systems, four instead of two frequencies are employed. Quadraphonic broadcasting is still in its experimental stages, and the FCC is currently evaluating various quadraphonic systems. Serious evaluation began in 1972 with the formation of the National Quadraphonic Radio Committee (NQRC) of the Electronic Industries Association. The problem in transmitting four-channel sound via broadcasting is the development of systems which will provide definite separation of the four frequencies and still allow radios not equipped for quadraphonic reception to receive stereo FM and monophonic FM. Without widespread standardization of equipment to receive quadraphonic broadcasting, it is difficult to measure the potential demand for this system in the first place.

Experiments in Quadraphonic Broadcasting

Some attempts have been made, however, to educate the public in the potential benefits of quadraphonic broadcasting. There was one promotional experiment on July 24, 1976. Two San Francisco radio stations, both stereo, joined in a broadcast permitting listeners with two radios, both capable of receiving stereo, to hear what quadraphonic broadcasting of high quality sounded like.[5] Two Sacramento, California stations repeated the experiment by simultaneously rebroadcasting the signals of the two San Francisco stations.[6] Whether quadraphonic broadcasting becomes a reality on a mass scale will depend on public demand, support from quadraphonic equipment companies, and the FCC.

Dimensions of Quadraphonic FM

When there is true separation of the four quadraphonic channels, the listening experience is literally being surrounded by sound. For example, assume you are listening to a live performance of a chamber orchestra. On stage is a violinist, a pianist, a trumpeter, and a flutist. As you listen to the music, all of the instruments are in front of you. If we placed microphones in front of the orchestra, one to the left and one to the right, and broadcast the music in stereo, you could hear the sound simultaneously from the same two directions in your living room.

Now assume we use four microphones. One is directed toward the violinist, the other toward the pianist, the third toward the trumpeter, and the fourth toward the flutist. We now broadcast the music on a quadraphonic four-channel system, and you listen to the music on a radio capable of receiving all four channels. A separate speaker is connected to each channel. If you place one speaker to the left front of you, a second to the right front, and the third and fourth speakers to your rear, the sound will be like sitting in the *middle* of the orchestra instead of in front of it.[7] Now consider a radio commercial in quadraphonic sound. Close your eyes and imagine sitting in a new automobile as the salesperson walks around the car telling you about its features.

Pros and Cons of Quad

Along with the "total" sound experience, proponents of quadraphonic broadcasting use the coming of stereo AM as an argument to develop quadraphonic broadcasting. They claim that with AM stereo, FM broadcasters will need this added quadraphonic dimension to retain FM as a special attraction. More conservative watchers say there is a need to determine first from where the software (records and tapes) will come before leaping ahead with full-scale quad. Moreover, sales figures indicate that quadraphonic systems have not been overly popular for in-home use.[8] Somewhere among all of these arguments lies the future of quad.

am stereo

Like quadraphonic systems, AM stereo is still in the experimental stage. For many years, AM broadcasting has not seriously considered stereo beyond laboratory ventures, primarily for two reasons. The first was the narrow channel width of AM stations, 10 kHz compared to 200 kHz for FM. Second, since FM has not really been a serious competitive threat to AM, there has not been widespread interest in the system. However, as FM gradually has cut a wide swath through the AM listenership, AM broadcasters have begun to search for something which would regain their competitive edge. The answer seems to be AM stereo.

As with quadraphonic, AM stereo is available through many different systems, and the FCC is examining each to determine a compatible standard for the industry. Active evaluation of all systems began in the mid 1970s by the National AM Stereo Committee (NASC) of the Electronics Industries Association. The collection of field performance data on AM stereo was completed in 1977.[9] One of the possible systems proposed by RCA uses both amplitude and frequency modulation. In this system, one part of the signal is transmitted by frequency modulation, the other by amplitude modulation. A special stereo AM radio receives the amplitude modulated signal separately from the frequency modulated signal. As with FM stereo and quadraphonic systems, it is necessary for AM stereo receivers to be able to pick up both stereo and monophonic signals.

By 1980 the FCC had authorized stations KFRC in San Francisco, KHJ in Los Angeles, KCMO in Kansas City, and WOW in Omaha to test AM stereo on the air.

The future widespread use of AM stereo looks bright for two reasons. First, there is considerable backing for AM stereo from the many AM broadcasters who already have felt the competitive sting of FM.[10] Second, the technology is ready. The future will depend on how quickly equipment can be standardized, and how the public accepts it, as demonstrated by the sale of AM stereo receivers.

transmitting tv signals

Our discussion would not be complete without mentioning television transmission. Television stations broadcast on frequencies which are located both above and below the standard FM radio frequencies of 88–108 mHz. Radio waves are used to carry the television picture. The width of the spectrum allocated for television transmission is established by the FCC at 6 mHz. Part of the frequency is used to transmit the video portion of the signal and part of it, the audio portion.[11]

Processing the TV Picture

Earlier in this book we learned about Paul G. Nipkow and his "mechanical" television, which consisted of a scanning disc with holes punched in the pattern of a spiral. When the disc turned, the holes would pass over a small opening through which could be seen a picture. In one complete revolution of the disc, the entire picture would be scanned and transmitted to another receiving unit, which would then reproduce the image. If the image were replaced with another in rapid succession, it would give the illusion of motion.

Further refinements changed the process and with the invention of Vladimir Zworykin's iconoscope tube, electronics picked up where mechanics left off. Using electrons instead of a spiraling disc, the image could be scanned with increasing clarity and speed. The result was the electron-scanning process as we know it today. A simplified example is to imagine a flag with a series of red and white stripes. The scanning process first scans the white stripes and then the red stripes. Now imagine this process taking place 525 times per second with the picture (flag) rapidly changing. The result is a series of rapidly scanned and broadcast pictures which appear on our television set as an illusion of motion.

Processing Color Television

A similar process is used with color television except that the television camera separates the three primary colors of light: red, green, and blue. All other colors are made up of a combination of these three primary colors.[12] When the television camera scans an image, it separates the red, blue, and green hues. These are transmitted individually and then appear as tiny microdots on our television screen. The microdots are too small for us to see with our naked eye, tending to "run together," creating the color picture. This, plus the rapid scanning process, creates a picture in both color and motion.

the path of electromagnetic waves

Melinda drives in and out of the rush-hour traffic looking anxiously for the exit which will send her east on the interstate, over the Allegheny Mountains and on to the Atlantic coast. The beltway seems a little less harrassing with the company of her favorite AM radio station. She decides to keep the station on as long as she receives clear reception. Here comes the exit sign; she is on her way. The station continues to provide clear signals, and Melinda listens attentively to weather reports. A major storm is ahead, but she will not reach it for at least an hour.

About 90 minutes from home, the radio station begins to fade. Finally, it is necessary to push another button on the car radio. This time, she also switches to the FM frequencies. As she turns the dial, she hears another station from her home town. The signal is clear, and once again she settles back to enjoy the drive as she heads up the west side of the mountain. It is beginning to rain when she reaches the summit, and lightning flashes as she heads down the other side. Less than ten minutes after crossing the summit, she loses her home town FM signal and switches back to the AM frequencies to pick up a nearby station. Heavy static garbles the receiver, but she finally finds a nearby signal and learns that the rain should stop in another hour. Sure enough, 50 miles farther, the moon breaks through the clouds and casts a soft glow on the open countryside.

Now she is beginning to feel the strain of the drive. The bright lights from the diner up ahead look inviting. She decides to stop for a sandwich. Walking through the door of the diner, she hears the familiar sound of her home town AM station, the one she listened to when she started her trip more than three hours ago. Melinda tells the waitress not to hurry. She just wants to unwind and listen to the music.

Ground Waves

To understand how radio waves travel, let's retrace Melinda's route. When she was on the beltway and on the interstate approaching the climb over the mountain, she had little difficulty listening to her home town AM station. That station was on the lower end of the electromagnetic spectrum, and the signal from the transmitter was carried partially by *ground waves*, which are *electromagnetic waves which adhere to the contour of the earth* (Figure 4–8). As a result, Melinda was able to listen uninterrupted until the waves finally died out and she had to change stations. In radio terminology, the area covered by the ground wave is the *primary service area*, or "the area in which the ground wave is not subject to objectionable interference or objectionable fading."[13] It is also that portion of the station's signal which is most protected by the FCC when licensing other stations which could interfere.

Sky Waves

When Melinda arrived at the diner, she again heard her home town AM station. The reason the radio at the diner was able to receive the station was because of *sky wave propagation* (Figure 4–8). With sky wave propagation, the *radio waves actually travel into the sky instead of along the earth's contour.* However, they all do not remain in the sky, some bounce off

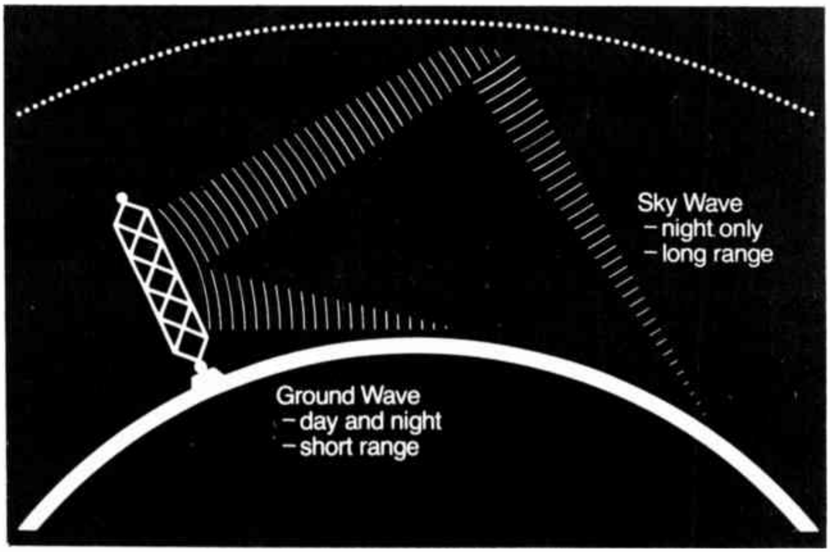


Figure 4–8 Radio waves travel in different patterns. Ground waves stay close to the earth's surface, and sky waves bounce off the upper layers of the atmosphere. Direct waves travel in straight lines, usually adhering to line of sight. (FCC *Broadcast Operators Handbook*)

different layers of the ionosphere and head back to earth. In other words, they are reflected back to the earth's surface. As a result, there is a section on the earth's surface which neither ground nor sky waves reach (Figure 4–8). In Melinda's drive to the coast, this occurred just before she started up the mountain. The diner, however, was in the path of the sky waves. This phenomenon is also referred to as *skip*, and the distance from where a sky wave touches the earth to the transmitter is the *skip distance*.

That area in which a station's signal is heard clearly because of sky wave propagation is referred to as its *secondary service area*. The secondary service area is defined as "the area served by the sky-wave and not subject to objectionable interference."[14]

Do you remember when the signal from Melinda's home town AM station began to fade, and she finally changed stations? At that point, Melinda had reached the *intermittent service area* of the station, or that "area receiving service from the ground wave but beyond the primary service area and subject to some interference and fading."[15]

Melinda reached the diner at night. If she had reached it at noon, the AM station may not have been audible. The ionosphere has different reflective qualities at different times during the day. The sun warms it and decreases its ability to reflect sky waves.

Direct Waves

When Melinda reached the mountain and the ground waves died out, she changed frequencies on the car radio. She also switched to the FM band. Here she was again able to hear clearly a station from her home town, an FM station. At the higher frequency of FM (88 to 108 mHz), are radio waves called *direct waves*, which *travel in a straight line.* As Melinda began to climb the mountain, the antenna on her car was in a direct line of sight position with the transmitter of the FM station. When she crossed the summit, the mountain blocked the waves, and she could no longer hear the station.

Keep in mind that because the FM station was on a higher frequency, the signal traveled in a direct, "line-of-sight" path between the transmitter and the receiver, not because the station was FM. As a general rule, the higher the frequency, the more "direct" the wave propagation will be.

assigning frequencies on the electromagnetic spectrum

Through a long series of policy decisions, based partly on definite planning and implementation and partly on "squatters' rights," the FCC has developed a systematic allocation of the available frequencies on the electromagnetic spectrum.

Allocating TV Channels

For television, the allocations are based on eliminating interference between channels. For channels 2 through 13, this means at least one channel separation between stations serving the same community. However, the development of more sophisticated transmitting and receiving equipment coupled with the demand for more channel utilization may someday change this allocation pattern.

Allocation of AM

Between 535 and 1605 kHz are 107 channels, or "frequency locations," in which AM stations can operate. Each occupies 10 kHz of space; thus, one is located at 540 kHz and every kHz thereafter until 1600 kHz. The characteristics of the frequency determine the ability of a station to reach a geographic region.

To provide maximum opportunity for developing AM staions, to foster free enterprise competition, and to protect those pioneer stations which staked early claims to the airways, the FCC uses three major classifications and numerous subclassifications in assigning frequencies. The major classifications are clear channels, regional channels, and local channels. Channels are specific frequencies (540, 550, 560, 570 kHz and so forth) on the broadcast band.

Clear Channels. A clear channel is one "on which the dominant station or stations render service over wide areas and which are cleared of objectionable interference within their primary service areas and over all or a substantial portion of their secondary service areas."[16] From this definition, it is easy to see that clear channels operate at a high power and have priority over a given frequency. Within the clear-channel allocations are Class I and Class II stations. Class I stations are protected from interference in both their primary and secondary service areas. Class II stations can operate on clear-channel frequencies but must protect Class I stations by either using directional antennas, operating on reduced power, signing off at sunset, or combinations of all three. The maximum operating power of a clear-channel station is 50,000 watts, and the minimum operating power varies from 250 watts to 10,000 watts. Some of the more famous clear-channel stations include KDKA in Pittsburgh, Pennsylvania and WSM in Nashville, Tennessee.

Regional Channels. Regional channels are assigned where several stations operate, none having a power of more than 5,000 watts.[17] There are many more regional channels than clear channels. The primary area serviced by stations operating on regional channels is the city or town in which the station is located and its adjacent areas. Regional channels are found over the entire range of the AM band, yet their specific channel assignments do not duplicate those of clear channel stations. Their secondary coverage areas and sometimes portions of their primary coverage areas are not protected from interference as are those of clear channel stations.

Local Channels. Local channels usually are located at the upper end of the AM band and operate with power no greater than 250 watts at night and 1,000 watts during the day. Some are required to sign off at sunset to protect other stations, even those which also operate on local channels. Local channel stations are the backbone of medium- and small-town radio. Many operate with a maximum power of 250 watts at all times, and their programming runs the gamut from automated country-western to want-ad radio.

Allocation of FM

The allocation of FM frequencies is similar to that of AM. However, the maximum range of an FM station, regardless of its power, is usually to the horizon or to a distance of about 70 miles. Generally, the lower end of the FM band between 88.1 and 91.9 MHz is allocated to noncommercial broadcasters.[18] The remaining portion of the band is allocated to commercially operated FM stations. Commercial FM stations also fall into station classes. As a rule of thumb, Class C FM stations serve the widest area with the highest power, regulated to a maximum of 100,000 watts. Class B and Class B-C FM stations serve smaller communities. Noncommercial FM stations fall into the three classes assigned to commercial FM stations but have an additional Class D category which is designated for noncommercial stations not exceeding 10 watts.

directional and nondirectional stations

The importance of any station's frequency allocation is its ability to serve a given population base without interference from other stations. The FCC is careful to require special antenna systems to prevent interference wherever possible. Although the problem is not yet critical in the FM band, spectrum space is at a premium. To avoid interfering with other stations, many AM stations operate as either directional or daytimer stations or as a combination of both. Daytimer stations are those which are authorized to operate only between sunrise and sunset, local time. If the station were allowed to operate past the sunset hour, its signal would travel great distances because of the reflective qualities of the ionosphere.

Directional antenna systems are designed also to protect against interference. The next time you are out for a drive, scan the horizon for a cluster of antenna towers. That cluster has a purpose. The strategic location of the towers in the cluster permits the signal from one primary tower to be radiated among the other towers, creating a specially shaped, broadcast-coverage contour that does not interfere with the other stations' contours (Figure 4–9). Broadcast-coverage contours come in all shapes and sizes, all designated by the FCC to maintain relatively interference-free airwaves.

international spectrum management

The need for international agreements sharing the available space on the electromagnetic spectrum is not new. When Marconi set up shop on Newfoundland's coast for a transatlantic broadcast, the Anglo-American Telegraph Company of Newfoundland promptly told him if he did not "remove his apparatus forthwith," he would face an injunction. Such rigidity has been softened over time by numerous agreements between nations on not only experiments but on allocation of frequencies.

Some of these are coordinated by the International Telecommunica-

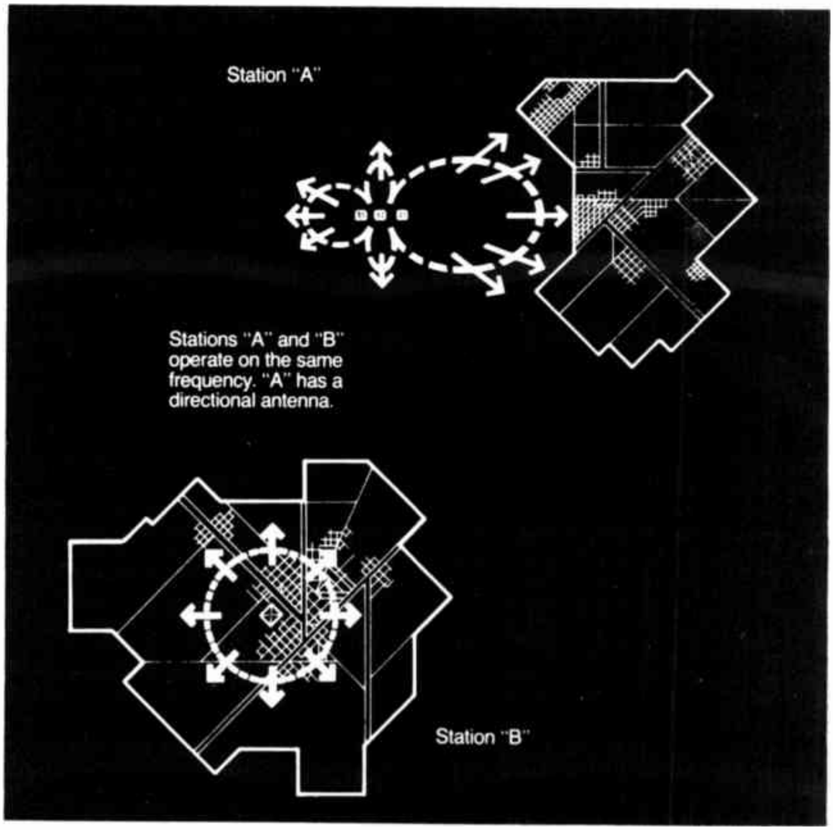


Figure 4–9 Directional antennas permit stations to operate on the same frequency without interfering with each other. (FCC *Broadcast Operators Handbook*)

tion Union, a United Nations organization responsible for worldwide coordination of frequency use.[19] The ITU's origin dates back to 1865 with the formation of the International Telegraph Union in Paris. It was not until 1906, however, that the organization considered the issue of wireless communication. Then the medium captured the world's enthusiasm as well as provoking its ire. As we learned in chapter 2, Germany accused the Marconi Company of monopolizing the wireless. From these charges came the Berlin Conference of 1906 and the first major international agreement on the use of the airwaves. In this spirit, eighty-five countries met in Geneva, Switzerland in 1959 and signed an agreement which became the governing body of the ITU. The ITU's International Frequency Register keeps track of the use of every available space on the electromagnetic spectrum. Periodic World Administrative Radio Conferences (WARC) are held to review decisions and formulate future use of the spectrum, the most recent being in 1979. We shall learn more about the ITU in chapter 16.

The United States entered into the North American Regional Broadcasting Agreement (NARBA) in 1937 at the Inter-American Radio Convention in Havanna, Cuba. Although the NARBA contemplated working relationships for such broadcasting policies as standards for engineering practices, these relationships exist only between the United States and Canada.[20]

summary

Radio waves can be compared to a point on the electromagnetic spectrum, a yardstick of electromagnetic energy which includes such forces as microwaves, light waves, and X-rays. Radio waves travel at the speed of light at a frequency dependent on the length of each wave. They vary in amplitude and frequency. Variations in amplitude are used to modulate radio waves in the AM broadcast band, and variations in frequency are used to modulate radio waves in the FM broadcast band.

Because of the greater width allocated to FM stations, both stereo, or dual-channel, and quadraphonic, or four-channel, broadcasting are becoming popular. In an effort to retain a competitive edge, AM proponents are developing AM stereo.

Radio waves are of three types: ground, sky, and direct waves. The Federal Communications Commission, through its assignment of frequencies, guards against signal interference of these waves between radio and television stations. The FCC in cooperation with other regulatory agencies, through the State Department, and with other countries, participates in an international effort to use responsibly the spectrum throughout the world.

spotlight on further learning

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5

broadcasting's use of microwaves and satellites

FOCUS After completing this chapter we should be able to

Explain how microwaves are used for such things as television programming, satellite relay, cable and pay-subscription TV.

Explain how microwaves are used in electronic news gathering, and in educational, and industrial television.

Trace the role of satellites in early television programming.

Describe the theory of the synchronous orbit satellite.

Describe the uses of NASA's Application Technology Satellite and Canada's Communications Technology Satellite.

Discuss the international implications of direct-broadcast satellites.

The atmosphere and standard over-the-air broadcasting are necessary to deliver broadcast messages to the public. Other important parts of the worldwide system of broadcasting are applications of microwave technology, satellites, and telephone systems. In any broadcasting day, the chances are excellent that the broadcast messages we receive traveled on one or all of these three carriers. In this chapter, we shall examine how each is applied to broadcasting and how they join to carry the broadcast message.

using microwaves

Not all broadcast transmission and relay are at standard AM, FM, and TV frequencies. The electromagnetic spectrum also is used at much higher frequencies, in the thousands of megahertz range. It is in this area that *microwave* transmission is found. Microwaves are *very short waves.* We have learned that the higher the frequency is, the farther the electromagnetic waves will travel in a direct line-of-sight path between transmitter and receiver. Thus, microwaves always travel by line-of-sight transmission.

Microwaves also allow many more channels of communication to operate because of its shorter wavelengths. Because the waves are shorter, many more will fit into the same space on the electromagnetic spectrum. Many thousands of channels are possible, and the frequency width is in the billions of cycles per second. When we realize that an AM radio station is allocated a width of only 10,000 cycles, it is easy to see how much more information can be transmitted at higher frequencies. Microwaves are necessary to bring us our evening television programs or to relay satellite pictures across oceans. The current state-of-the-art in microwave technology has barely scratched the potential of this multifaceted carrier of information, much of it affecting the broadcasting industry. We'll now examine the uses of this technology in more detail.

Relaying Television Programming

A network television program may travel many thousands of miles before it reaches your local television station. The path it follows may very well use microwave relay systems. These dishlike antennas dot almost every landscape from the roofs of skyscrapers to the peaks of snowcapped mountains. Using high frequency line-of-sight transmission, these systems can carry crystal clear signals over long distances through a series of relay antennas which are approximately thirty miles apart. Their advantage is the lower cost and increased efficiency of transmission over traditional land-line systems.

Consider, for example, a television station in the rugged Colorado mountains which receives its network signal from Denver. To string a cable over the Rocky Mountains would be far too costly. Instead, microwave towers on mountain tops (Figure 5–1), all within sight of each other, become the path over which the signal travels.

But mountain country is not the microwaves' only domain. Because

Figure 5–1 Microwave antennas, such as these atop a mountain near Boulder, Colorado, provide long-distance communication links without wires. (AT & T Co.)

flat areas are free from natural obstructions, microwave systems are scattered over the plains of the farm belt and the deserts of the southwest for an efficient transmission system.

Keep in mind that the program you receive in your home does not arrive there directly by microwave. The local television station receives the signal via microwave then retransmits it to your home receiver at a frequency regularly assigned to television transmission. You also should be aware that the television station probably does not own the microwave system, but rather rents its frequency, just as it would rent a line from the telephone company. Many private companies including major telephone companies, own microwave systems. These systems currently comprise about 30,000 transmission miles in the United States alone.

Satellite Relay Systems

Ground-based microwave systems are not the only route used to carry television programming. Widespread use of microwave satellite transmission is evident in any week's television fare, with the familiar "live via satellite" message across the bottom of your television screen. Even if you do not see a live satellite-relay picture on the evening news, the chances are that foreign correspondents' reports were first fed by satellite to the network's headquarters, videotaped, and then played back as inserts in the evening news. Because space is a vacuum, microwaves travel over long distances unimpeded by the earth's heavy atmosphere near ground level. This permits a transmitting station in London, for example, to transmit a television picture by microwave to a satellite thousands of miles in space, which relays it back to an earth-receiving station in the United States. Satellites are also used to bring television signals to many outlying regions in which even microwave links would be too costly (Figure 5–2). We shall learn more about satellites later in this chapter.

Cable and Pay-Subscription TV

Although you may receive television programs through your local community antenna television system, often called *CATV* or *cable*, the original signal probably reached the local cable company through a microwave-relay link. A cable company often leases a microwave channel, receives the direct-broadcast signal from a television station, then retransmits by microwave many hundreds of miles to a cable system in a community far removed from the original television station (Figure 5–3). In fact, this use of microwave is one reason cable systems have come under FCC jurisdiction.

A newer use of microwave in certain metropolitan areas sends special programming to pay-television subscribers. An example of this is the

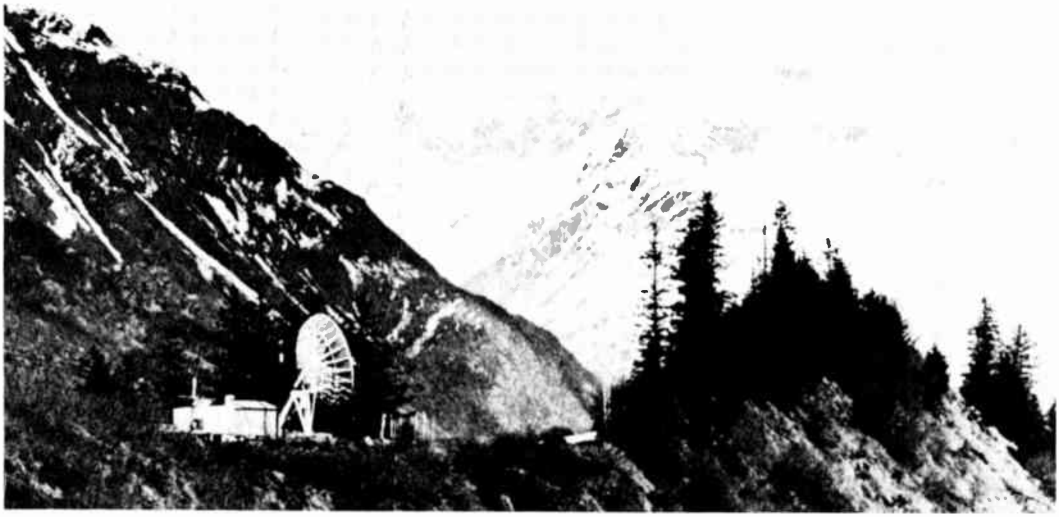
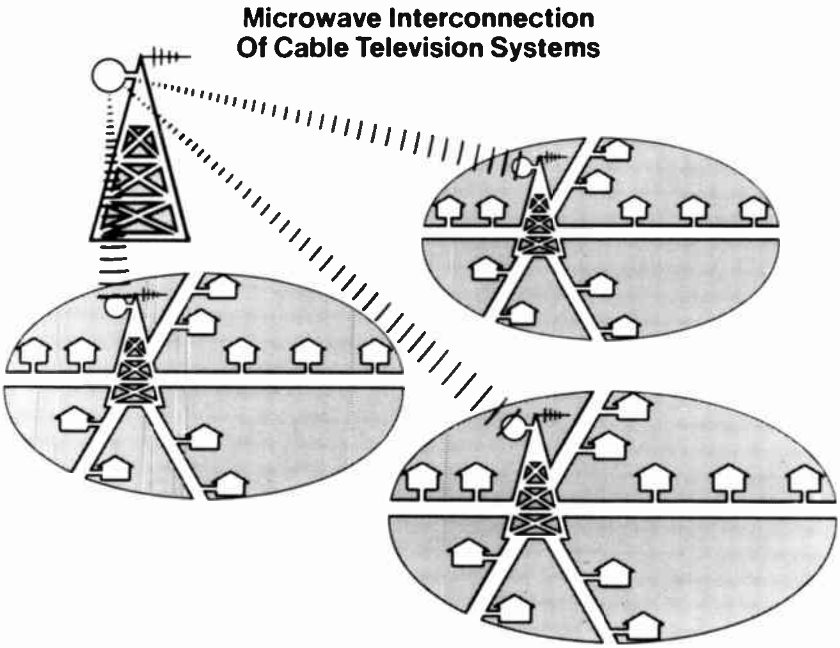


Figure 5–2 The Valdez earth terminal of RCA Alaska Communications is typical of the remote communication links provided by microwave and satellite communication. (Scientific-Atlanta)

Figure 5–3 Microwave connections permit cable systems to receive signals from distances far greater than those stations can broadcast. (NCTA)



Chicago-based, pay-TV channel.[1] From a studio control center, a signal is sent via microwave to a receiving dish antenna on top of a Chicago skyscraper. From there, it is retransmitted by microwave to other microwave-receiving antennas on top of high-rise apartment complexes and hotels. Hotel and apartment television sets are then connected by cable directly to the microwave-receiving antenna on top of the building. These systems not only can receive but also can initiate live programming from a studio in the way a local television station can. The studio programs are then sent over the system to subscribers. Also called subscription television, the system is gaining popularity as an alternative to over-the-air broadcasting.

Electronic News Gathering

The application of microwave to electronic news gathering has given television the flexibility that only radio once enjoyed. A mobile van and portable camera (Figure 5–4) can provide live programming from a

Figure 5–4 Through well-placed microwave links, a television station has the ability to broadcast live news from virtually anywhere in its coverage area. News crews theoretically can go on the air live from almost anywhere in the world. (KCMO-TV)

community arts fair or live aerial scenes of a football stadium, and the unrehearsed moments of a newly elected politician's acceptance speech can give television news a dynamic dimension. New developments in microwave ENG systems now bounce the microwave beam off the side of a building to a relay antenna, permitting the eyes of a live television camera to peer into almost every nook and cranny of the largest metropolitan areas.

Educational and Industrial Television

In Salt Lake City, Utah, a group of students watches an instructional television program sent from a classroom forty miles away at Brigham Young University in Provo.[2] The audio and video transmission between the two schools is made possible by a microwave link. Students in Salt Lake City can even answer the professor in Provo by microwave. In Indiana, all of the state-supported universities are connected by a microwave link, and they thus can exchange their instructional television programs.[3]

Businesses using television use similar microwave hookups. A plant with two locations in the same city can use microwave for an intracorporate television link. With this, special sales-training seminars can be broadcast from the main corporate television studio to a special seminar room on the other side of town. Or using the leased facilities of a national microwave system, a special videotaped management-training program can be distributed to plants throughout the nation. Businesses and television stations alike also can use microwaves to transfer computer data, providing connections between systems hundreds and even thousands of miles apart.

When microwave systems were first developed, they opened up whole new frontiers for communication. The wide channel width permitted much more information to be sent than was possible with lower frequency systems. Microwave systems were also relatively free from interference. In many ways, they were superior to cable systems, especially for long-distance communication.

The existing, well developed microwave systems will undoubtedly remain in service. Yet two words stand squarely in the way of microwave: fiber optics. These microscopic glasslike fibers through which light passes use laser beams to carry information equivalent to what can be transmitted on thousands of cable channels. In fact, fiber optics now permit telephone systems to compete with cable companies and microwave systems as major carriers of information.

The future interrelation between fiber-optic technology and our need and desire for its potential will determine the future of worldwide broadcasting systems. It will also determine how much regulatory control we exercise over its use and whether such multibillion-dollar corporations as AT&T will be the true "gatekeepers" of the future.

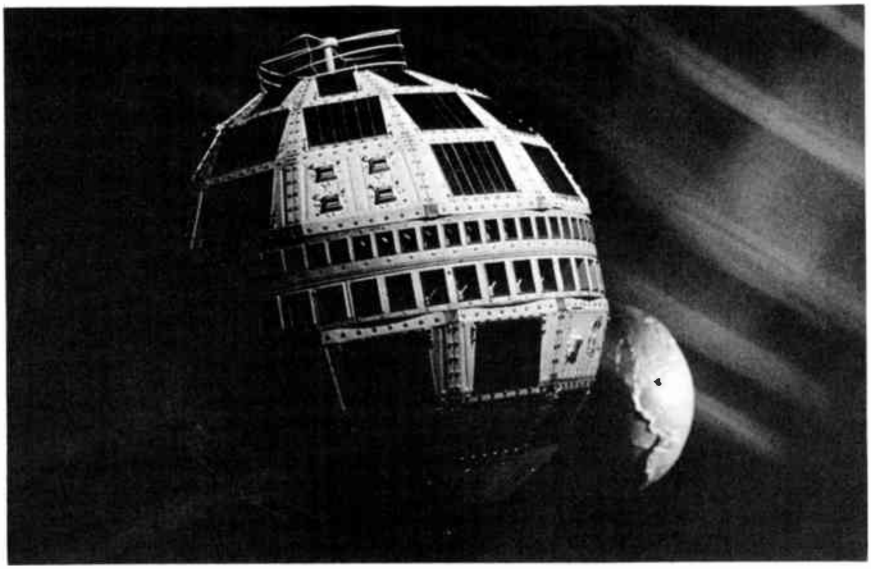
satellites and broadcasting

The wedding between satellites and broadcasting took place on a warm New England evening in Andover, Maine.[4] From this outpost the first television pictures were relayed by satellite across the Atlantic to Europe on July 10, 1962. The pictures were of then Vice President Lyndon B. Johnson and several AT&T officials gathered in the Carnegie Institute Auditorium in Washington, D.C. The event covered many columns in major newspapers in the United States and Europe as well as news bulletins on the television networks.

Telstar

The hero of the evening was a 170-pound payload named Telstar (Figure 5–5). It had been launched into space in a cooperative effort by NASA and AT&T. This beach-ball sized satellite sent signals to television stations in France and England by first receiving them from United States's earth-

Figure 5–5 Telstar, launched in 1962, ushered in the era of live satellite-relayed television pictures. (AT & T Co.)



based antennas, amplifying them ten million times, and retransmitting them to European receiving stations. Telstar was powered by solar energy. On any given pass over the United States or one of the European receiving stations, the satellite was in viewing range for only about 45 minutes. The highest point in Telstar's orbit, the apogee, was 3,502 miles away. The closest point to earth during its orbit, the perigee, was 593 miles away. Directing the project for AT&T was 44-year-old Eugene Frank O'Neill, a Columbia University engineering graduate.

In return, the United States received signals from Europe the following evening. From France came a seven-minute taped program with an appearance by Jacques M. Marette, the French Minister of Postal Services and Telecommunications, and musical entertainment by French performers. The British signal followed shortly thereafter, consisting of a test pattern and a live broadcast by Britain's Deputy Chief Engineer, Captain Charles Booth.

The Politics of Telstar

It is not surprising that the breakthrough of transoceanic broadcasting brought with it a series of political issues, some based on age-old rivalries, others on contemporary concerns. The most intense rivalries were between England and France, long-time sparring partners in economic and political warfare. Telstar merely set the scene for their combat. On the night of the first transoceanic broadcast, British pride was hurt when its receiving station was not able to monitor clear audio and video signals from the United States. The French, meanwhile, using a station that was not supposed to be ready for tests, monitored clear signals which were described as though they came "from about twenty-five miles away." The British, however, did achieve a victory that night when they relayed a live television program to the United States in contrast to France's taped program.

In the United States, the press was quick to report that AT&T had paid NASA to launch Telstar. This agreement also called for the free availability of any inventions arising from the Telstar project to any company that wanted them. President John F. Kennedy formally called for a national corporation to oversee all satellite communication development in the United States. The Kennedy administration also emphasized the need for commercial broadcasters to participate in examining the potential of satellite communication. That bit of political rhetoric tried to pull down the fence that FCC Commissioner Newton Minow had put up a year earlier between the administration and commercial broadcasters with his famous "vast wasteland" speech before the National Association of Broadcasters' convention.

Economic and Social Implications of Telstar

Telstar created much more than international television communication. The morning after Telstar's broadcast, AT&T became the most active stock on the New York Stock Exchange with 105,800 shares traded. Opening at 109⅞, it closed at 113¼, the day's high and a gain of 3½ points. Less than a month later, David Sarnoff, chairman of the board of RCA, proposed the concept of a single company to deal with international communication matters.[5] Western Union quickly supported Sarnoff's suggestions, saying it had proposed similar concepts before.[6] The concept, along with the Kennedy administration's support, was accepted with the passage of the Communications Satellite Act of 1962 and the formation of the Communications Satellite Corporation called COMSAT.

The prospect of domestic television programming crossing national boundaries opened up a new arena for discussion and heated debate. The vast wasteland was one thing at home but something entirely different when it reached France and England. The initial Telstar broadcast itself caused some concern. The program was produced by AT&T, which provoked CBS to break away from the initial network-pool coverage and not to carry the remarks of AT&T board chairman Frederick R. Kappel. Jack Gould, television critic of *The New York Times*, said of the event, "The sight of Government dignitaries serving as a passive gallery for private corporation executives was not very good staging, particularly for consumption in foreign countries." Gould went on to predict, "The crucial decision that will determine the lasting value of international television—a willingness of countries and broadcasters to clear the necessary time on their own screens to see and hear other peoples of the world—cannot be made in laboratories in the sky but in offices on the ground."[7]

Programming beyond Telstar

The early 1960s brought many international satellite experiments. Perhaps the most vivid occurred eighteen months after Telstar when the funeral procession of President John F. Kennedy in Washington, D.C., was seen in the halls of the Kremlin. By 1965, the Ecumenical Conference in Rome had been seen on both sides of the Atlantic.[8] European viewers saw and heard Washington dignitaries react to the unveiling of the Mona Lisa in the National Gallery of Art. Special programming from the 1964 Olympic Games in Tokyo traveled far beyond Japan.

stopped in space: the synchronous orbit satellites

A little more than a year after Telstar, there was another breakthrough in satellite technology. At Lakehurst, New Jersey, in 1963, a crew waited for a satellite called Syncom II to "lock" into position for a transmission that would be heard half-way around the world on a ship stationed at Lagos, Nigeria.[9]

Out of a static-born receiver aboard the U.S. Navy's *Kingsport* came the clearly heard words, "*Kingsport*, this is Lakehurst. *Kingsport*, this is Lakehurst. How do you hear me?" The words came from space, relayed back to earth from Syncom II, no ordinary satellite. The technical crews did not have to adjust their receiving equipment this time as the satellite passed within viewing range, because Syncom II was technically "stopped in space," the first successful synchronous orbit satellite. Its baby sister, Syncom I, had failed six months earlier. So, for Hughes Aircraft Company engineers Harold A. Rosen, Donald D. Williams, and Thomas Hudspeth, the team chiefly responsible for the satellite's development, Syncom II's success was especially welcome. This is how it worked.

Before Syncom II, scientists could utilize the communication capabilities of a satellite only when it passed over a given region of the earth. This meant it could be used for only about 45 minutes at a time. However, scientists felt if they could (1) position a satellite over the equator, and (2) place it at the right height (22,300 miles) at which it would travel at a speed similar to the earth's rotation, it would appear stationary above the earth. The launch of Syncom II achieved the desired position by placing it in *synchronous* orbit, also called *geo-stationary* orbit, over the equator. Since Syncom II, major communication satellite systems have used the synchronous orbit positions to create so-called microwave towers in space, permitting worldwide transmission of television signals, computer data, and telephone service.

tv and INTELSAT

Satellite communication mushroomed after the success of the synchronous orbit satellites. Entire plays from Europe could reach a living room in North America. The Olympics could travel from one side of the earth to the other. Understandably, international development and cooperation became paramount. COMSAT, formed by the Communication Satellite Act of 1962, quickly became the manager of the International Telecommunications Satellite Organization called INTELSAT, a group of countries which jointly owned a group of satellites.

On April 6, 1965, the first step in this international system was taken with the launch of an Early Bird satellite called INTELSAT I. It was positioned over the Atlantic and permitted live commercial television broadcasts on a regular basis for the first time. Early Bird was just one in a series of INTELSAT satellites circumnavigating the earth, providing a global system of communication. Construction of an INTELSAT V (Figure 5–6) system began in 1976 for a 1979 launch.

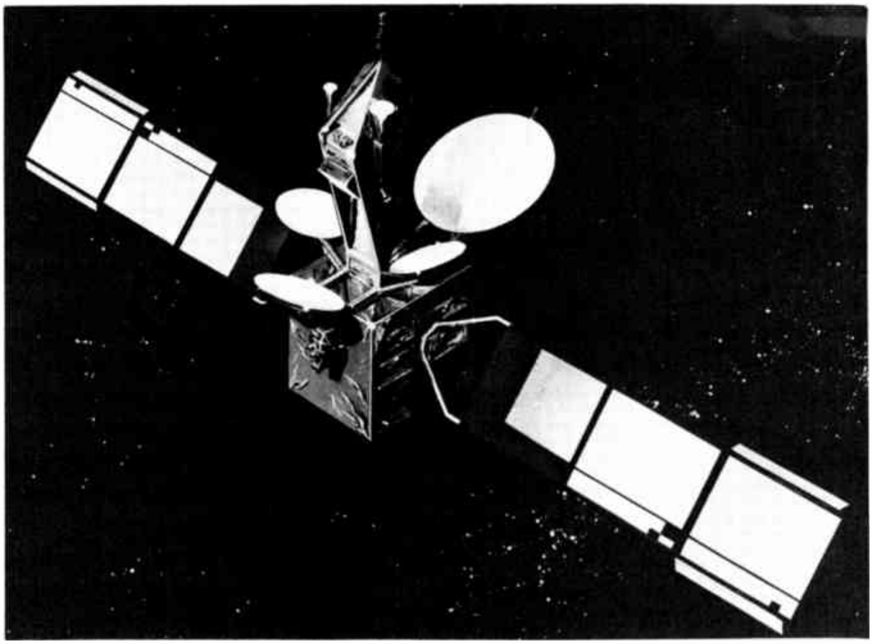


Figure 5–6 The Intelsat V spacecraft measures approximately 50 feet from the end of one solar panel "wing" to the other and has twice the capacity of previous Intelsat spacecraft. (Aeronutronic Ford)

etv and application technology satellites

Commercial television is not the only benefactor of satellite systems. In the United States, NASA developed the Application Technology Satellite program (ATS) for educational purposes.[10] It launched six such satellites in all, with the sixth sending satellite signals to small earth stations. This was the key to important applications of satellite technology, from log cabin schools in the mountains of Idaho to mud huts across the world in India.

In the United States, such towns as Gila Bend, Three Forks, Battle Mountain, Wagon Mound, Sundance, and Arapahoe, all participated in the ATS experiments. The local school yard had a new visitor in the form of a microwave dish and its strange antenna with cork-screw wires around a long metal tube. With the help of their visitor, students could sit in a classroom in West Yellowstone and talk via satellite to a classroom in Denver. Where no land-line or microwave system had been developed, the ATS-6 satellite (Figure 5–7) would beam a signal simultaneously across half a continent.

The program generated a cooperative, although somewhat reluctant,

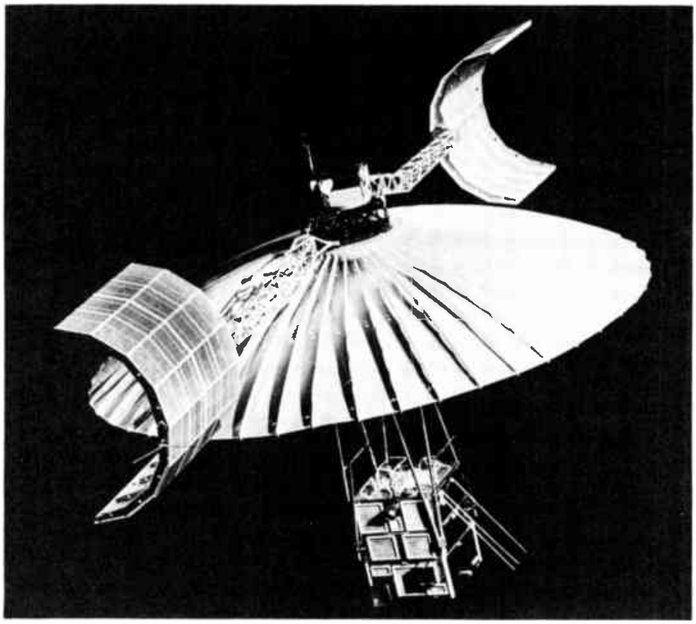


Figure 5–7 ATS-6 began a new series of educational television experiments first bringing direct in-school programming to outlying areas of the Rocky Mountains. (NASA)

effort between state governments. For example, issues affecting the local autonomy of schools usually formed a political thicket. But the Federation of Rocky Mountain States, Inc., composed of Arizona, Colorado, Idaho, Montana, New Mexico, Utah, and Wyoming, joined together to bring two-way educational television to the outlying communities in the eight-state region. In some areas, the satellite-receiving systems were hooked directly into the local cable systems or microwave translator systems, permitting the signals to be received at home. The ATS project also provided similar educational television programming for the Eastern United States, especially Appalachia.

After the American experiments, special earth-controlled rockets on the satellite shifted the ATS-6 from the Galapagos Islands to a new orbit over Kenya in Africa. From that position in 1976, it conducted educational television experiments in India where some of the population had never even seen television or motion pictures. Programs on modern agriculture, health, and family planning were part of the television fare. After the Indian experiments, the satellite traveled back into the western hemisphere, stopping along the way for demonstrations sponsored by the United States Agency for International Development (USAID).

domestic satellite systems

Not all satellite systems belong to or serve the purposes of an international audience. Although not in synchronous orbit, the first domestic satellite system named Molniya was developed by the Soviet Union and launched in 1965. Canada captured the first synchronous orbit satellite honors for its domestic communication satellite named Anik, launched in 1972. Western Union claimed the American satellite "first" with the launching of its two Westar satellites in the 1970s (Figure 5–8). The Westar system made Western Union the first United States corporation to use its own spacecraft. The company constructed earth stations at key points in the United States and hooked them into the regular land-line Western Union system. Television pictures can be carried by Westar as can telephone calls and computer data.

RCA also plunged into satellite communication and inaugurated America's first domestic satellite communication system in December, 1973 using leased channels first on Canada's Anik II and later on Westar II. RCA put its own satellites into orbit, Satcom I and Satcom II (Figure

Figure 5–8 Western Union's Westar satellite system showing its integration with the Western Union microwave network. (Western Union and *Communications* News)

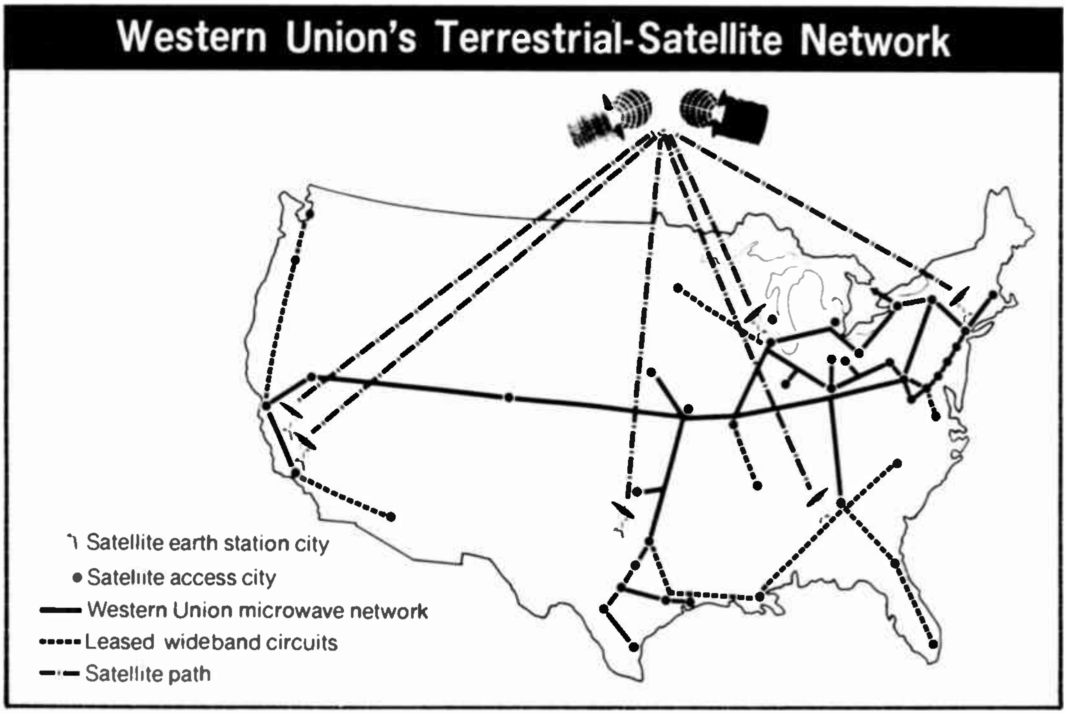


Figure 5–9 RCA's Satcom satellite, which is part of RCA's domestic satellite system. Satcom II has 75 square feet of solar cells mounted on two panels continuously pointed at the sun. The cells produce 740 watts of power sufficient to charge its batteries and drive the operating functions of the 1,000-pound spacecraft. Satcom III, operational in 1980, is devoted primarily to serving cable television systems.

5–9). A subsidiary company, RCA American Communications, Inc., owns and operates the domestic satellite system.

In 1976, NASA launched a new COMSTAR satellite system which is leased by AT&T from COMSAT. Each satellite has a 14,400-circuit system, and four satellites are planned for orbit by the 1980s. Each satellite is expected to remain operational for about seven years.

tv station in the sky: Canada's CTS satellite

The domestic and international politics of satellite communication are mind-boggling. There, positioned 22,300 miles away in space, is a television station that can beam a signal to any home in the world with the proper receiving antenna. This is the ultimate in direct broadcast satellites. The programs are received not through a cable or translator microwave system, but rather right onto the rooftops where an antenna, called a "dish," the size of an automobile tire, assimilates signals from space. That is exactly how Canada's Communications Technology Satellite (CTS) works, and the world is watching its progress.

The CTS idea is not new. But think of the implications. Theoretically, CTS enables any local television station serving a small community to beam its signal into the sky and retransmit it into every home on an entire continent. Launched on January 16, 1976 in cooperation with NASA, the CTS system is the basis for many ongoing experiments, including some in the United States. An Atlanta, Georgia, station is already beaming satellite-relayed programs to cable systems.

This is just the beginning. The world of 1980 sees Japan with a similar system beaming two television channels down to home receivers.[11] The receiving dish antenna rising above Tokyo will cost a relatively inexpensive $500, the key to bringing the general public into direct-broadcast satellite programming. For Germany, it is a satellite system three-and-a-half times the size of Canada's CTS. Other countries are sure to follow.

international implications

Satellite technology is only one part of the whole picture. Major issues of culture, politics, economic development, and similar topics are also at the heart of satellite communication development.

Intercultural Considerations

What will happen when the world communication systems are developed to the point at which the dish antenna on the roof is as common as the television set in the living room or the radio in a car? American programs in foreign countries have become popular overnight. Conversely, foreign programs broadcast in America have had similar effects. The evening news reports a president's visit to the Peoples' Republic of China, and major department stores immediately feature Chinese fashions. Stop and contemplate the cultural fusion of evening television fare of Russian lessons from Moscow, sports events from Germany and China, and a cooking demonstrations from Egypt. What will happen when societies are bombarded with dozens of cultural stimuli every day?

Communications attorney Leonard H. Marks asked similar questions in 1965:

Will the man in the street in New Delhi be asked about the Hindu-Moslem problem so that the factory worker in Detroit will have a first-hand report? Will programs of this type be designed to encourage a common language and break down the barriers which currently exist for communications between peoples of different

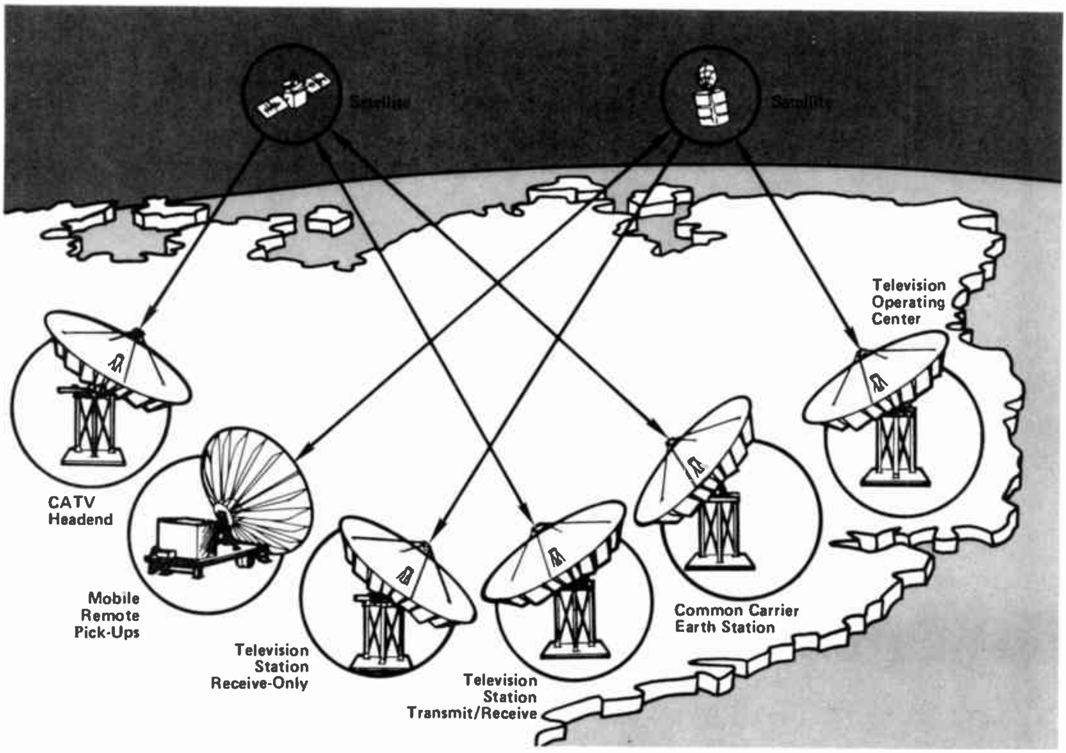
> *cultures? Is there any reason why we shouldn't feature international "town meetings of the air" with participants from Berlin, Rome, Cairo, or other distant points with their counterparts in Des Moines, Seattle and San Francisco?*[12]

Such questions are at the heart of the direct-broadcast satellite programming issue.

Political and Economic Implications

Direct-broadcast satellites are an example of technology advancing faster than legislation can deal with it. Today satellites provide a multitude of services (Figure 5–10). The world currently does not have a governing body, commission, or regulatory structure to keep up with this rapidly changing technology. Back in 1960, Dallas Smythe, former head of the FCC's economics division, predicted this dilemma: "The danger inherent in the development of space-satellite communications lies in the additional strain it will place upon international relations in the absence of international agreements on policy and organizations to control its use."

Figure 5–10 The multiple uses of satellite technology. (Scientific-Atlanta)



Predicting cold-war rivalry, he said, "The first power to begin extensive use of this new means of communication will initiate the deadly cycle. The second power will then try to outdo the first with a rival space-satellite communications system, and so on until international agreements are almost impossible to achieve."[13]

Problems are already developing, especially over the issue of what rights countries have in sending or receiving broadcasts across international boundaries. Mexico has already banned certain American television programs which it felt were too violent. Canada has taken economic steps to curtail American commercials. But these are only two countries. What happens when a Baptist church service in Alabama reaches a sacred culture in Thailand? How can a dictatorship retain power with massive amounts of televised propaganda from a democracy? Conversely, can a democracy succeed in the wake of a dictator's propaganda? What happens when the FCC rules that certain films are too sexually explicit for American television fare, yet every American living room has instant accèss to foreign, X-rated television films?

What will direct-satellite broadcasting do to the world economy? The local marketplace can literally become worldwide. A major department store with international branches can choose a popular world television program on which to advertise. A media buyer for an international ad agency may have to choose between purchasing time on a London channel or on one in Micronesia. Theoretically, a popular world program produced by a small, less-developed country could attract enough world advertising to affect significantly that country's balance of payments.

What happens when a television network moves its entire headquarters to a small country on the other side of the world where labor costs are a fraction of what it was previously paying? With direct-broadcast satellites, the network can reach the viewers back home with scarcely more effort or cost than it took to operate the domestic system. With this in mind, the research firm of Arthur D. Little, Inc., predicts that "the potential for competitive advantage afforded by the use of satellites might ultimately lead to the elimination of local TV broadcast stations."[14]

The AT&T—COMSAT Interface

Perhaps nowhere do economic issues surface faster than in the arena in which two corporations fight for the rights to operate future communication technology. Two companies with some of the biggest stakes are the American Telephone and Telegraph (AT&T) Corporation and the Communications Satellite Corporation (COMSAT). The former is a private industry, the latter quasi-governmental, formed by the Communications Satellite Act of 1962.

COMSAT is responsible for overseeing satellite development in the

United States. It even supplies AT&T with satellite circuits, and AT&T in turn, leases them to its users. Satellites are COMSAT's only business, but AT&T not only operates satellites but also ocean cables (Figure 5–11). Herein lies the crux of the problem. Will messages be sent via satellite or cable?

If satellites are used exclusively, then COMSAT benefits. If the government continues to permit a percentage of all messages to be sent by cable, then, theoretically, COMSAT could suffer. Of the two, satellites have the greater number of circuits. AT&T's COMSTAR satellites have over 14,000 circuits each, but its transatlantic cable handles only about 4,000 circuits. The complexity of which one is more economical is compounded by the fact that the life of a cable is much longer than the life of a satellite; yet cables are much more costly to construct and operate.

Some writers have argued that AT&T is taking advantage of a regulation that permits them to set user rates according to the investment necessary to develop the system.[15] Similarly, COMSAT's position is succinctly stated in its own report to stockholders: "Any policy of the FCC

Figure 5–11 Ocean dredges lay thousands of miles of cable which serve many of the functions of satellites, aggravating the discussion of the regulatory framework and cost-effectiveness of the two communication systems. (AT & T Co.)

which would permit COMSAT's carrier customers to bypass satellites in favor of new cables would have an adverse impact on the growth of COMSAT's international traffic."[16] The future of both carriers will depend on the future direction of telecommunication policy.

summary

At very high frequencies on the electromagnetic spectrum are microwaves which have many applications to broadcasting. They relay television programs between stations and networks. They also are used by satellites to beam television signals around the globe, and by cable systems to import distant television signals for redistribution to cable subscribers. Microwave technology is also used in electronic news gathering and in educational and industrial broadcasting.

Two other systems that carry broadcast messages are satellites and telephones. The Telstar satellite, launched in 1962, was the first to broadcast international television signals. Since then, many satellites have been applied to broadcasting. Synchronous orbit satellites provide twenty-four-hour communication among almost any points on earth, making continuous, live television coverage of international events a reality. Application Technology Satellites (ATS) beam educational television programs to outlying areas of the world, and domestic satellites provide a new national communication system for many countries. Telephone systems are also used extensively in broadcast communication. The future of both satellite and telephone systems for broadcasting depends on the developments in telecommunication policy regulating the two carriers.

spotlight on further learning

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PELTON, JOSEPH N., and MARCELLUS S. SNOW, eds., *Economic and Policy Problems in Satellite Communications.* New York: Praeger Publishers, Inc., 1977.

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part 3

Systems

6

cable

FOCUS After completing this chapter we should be able to

Trace the development of cable television and to identify the components of a cable system.
Understand how two-way cable works.
Compare the arguments for and against pay cable.
Explain cable radio.
Identify the many types of locally produced cable programming.
Understand the concept of local access.
Discuss the differing opinions of cable as expressed by broadcasters and cable operators.
Discuss the future of cable.
Understand the economics of cable systems.
Understand the human implications of our cable environment.

It is 1940, and television is in its infancy. Large, bulky home receiving sets strain to tune into the preciously few television stations broadcasting the magic of pictures over the airwaves. And strain they do. In fact, if you live in a remote area, it takes a large, well directed rooftop antenna even to focus on a picture. Rooftops are a maze of aluminum and steel.

Still, the excitement of this medium does not dampen your spirits. Instead you purchase numerous antennas. Newspapers are filled with ads claiming this or that make or model of antenna will give you clear reception. Stores even sell indoor "rabbit ears," which are two telescopic rods about three feet long connected to a base that sits atop your television set. For the most part, though, "rabbit ears" cannot compete with outdoor antennas.

the concept and its beginnings

Finally, someone realized there must be a better way. That way is with *community antenna television*, ~~commonly called CATV or cable.~~ The concept is simple: Erect a single tower and antenna on a high elevation and then run cables from that tower to individual homes. The result is clear reception without the housetop clutter of antennas. Five hundred companies which owned the antennas and charged a fee to people who want a hookup were created. A new medium was born.

The ~~idea of cable was~~ especially important ~~to people in~~ hilly or ~~mountainous country.~~ Because ~~both television~~ video and audio signals are broadcast at a relatively high frequency, they travel in an almost straight line ~~from the transmitter.~~ When there is a mountain between the television station's transmitting ~~antenna and a home~~ antenna, it blocks these signals (Figure 6–1).

Today, cable is advantageous to people other than those living in mountainous regions. Philadelphia cable subscribers, for example, can receive New York City's television channels. Although over-the-air reception necessitates one-channel spacing between stations to avoid spillover interference, cable does not. Also, building structures such as high-rise apartment houses, tightly spaced row houses, or clustered office buildings can obstruct even local television station signals. Consequently, cable has become popular for urban reception as well as for distant signals.

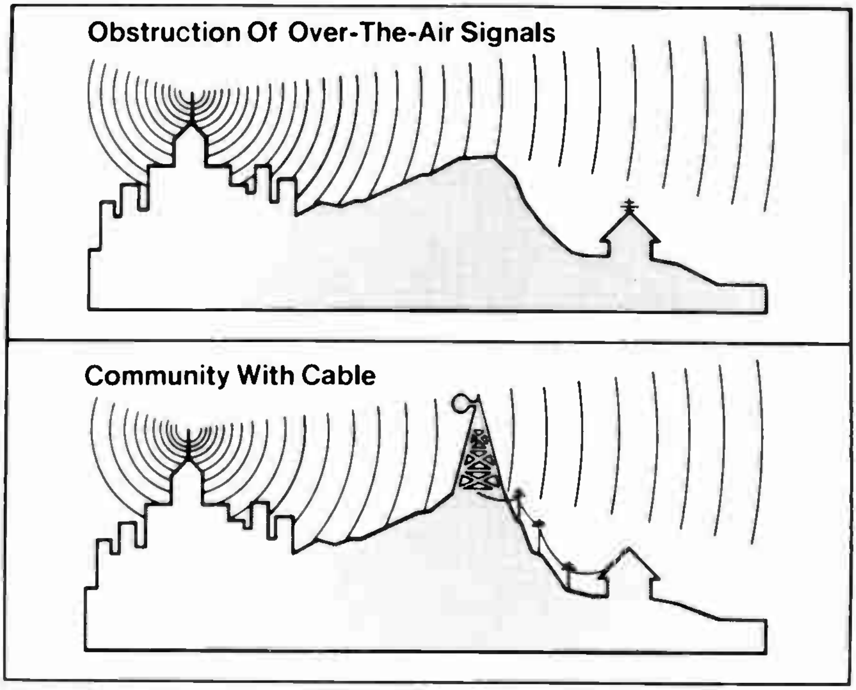


Figure 6–1 (NCTA)

Starts in Oregon and Pennsylvania

There was a bit of friendly rivalry in the origin of cable television. Two people claim that famous first, one in Oregon and one in Pennsylvania. L. E. Parsons is credited with a working cable system in Astoria, Oregon in 1948. John Walson is believed to have had a cable system operating in Mahoney City, Pennsylvania that same year. Some of the discrepency results from the definition of what is, or was, a true cable system. Parsons apparently did build a reception system but sold it to small cooperative groups.[1] The system did not operate on a monthly fee basis until sometime after August, 1950. In 1952, fire destroyed Walson's records of operations in Mahoney City. Research efforts thus far have failed to turn up bills, newspaper accounts, or other documentation. But Walson and others are unequivocal about the 1948 operation in Mahoney City.

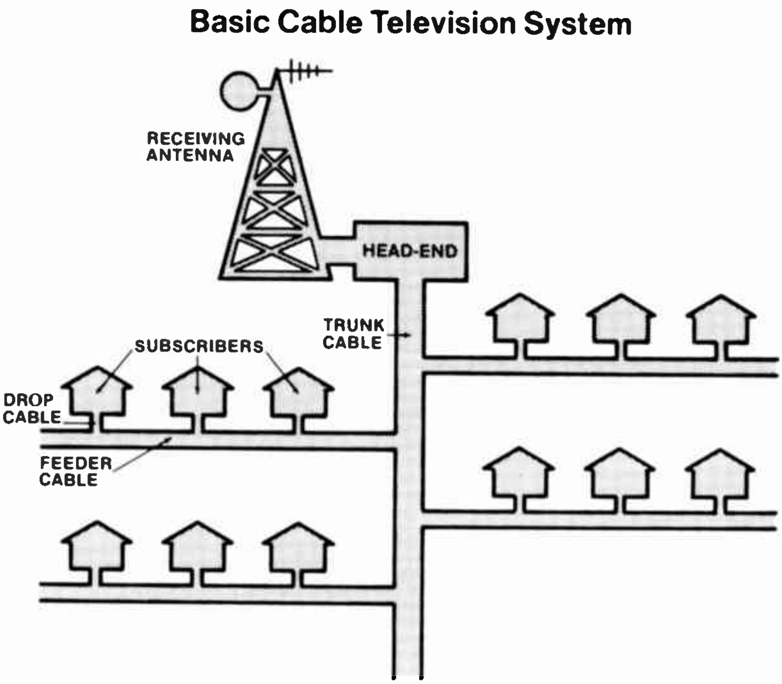
The Size of the Industry

Since those first beginnings in 1948, cable has grown considerably. Although it is still a long way from being connected to all of the television sets in use, it has developed to the point at which there are enough subscribers to make it profitable. Recent figures indicate approximately 3,500 cable companies operate in the United States today.[2] Those companies reach about 10 million subscribers, with revenues fast approaching $800 million annually. Pennsylvania has the largest number of cable systems, about 300, and California has the most subscribers, about 1.3 million. The cable company with the most subscribers is TelePrompTer with over 1 million.

components of the cable system

To understand how a cable system operates, let's examine its parts (Figure 6–2). The center of any cable system is the *head end*. The head end is a combination of human beings and technology. The human side includes the personnel who actually operate the cable system. The head end's technical components include the *receiving antenna* which receives the signals from a distant television station. The receiving antenna system usually is a tall tower on which are attached a number of smaller antennas specially positioned for receiving the distant signals. The tower can be located anywhere from a hillside outside of town to the top of a mountain

Figure 6–2 (NCTA)



far from a residential area. Installing the tower and antennas entails major construction using everything from lumber cutting crews to giant helicopters (Figure 6–3).

The head end may also be television production facilities such as cameras, lights, and other studio hardware, depending on the size of the cable system and how much locally originated programming there is in the studio. The facilities can range from a small, black and white camera to full-scale color production equipment. With all of this in mind, we will define the head end as *the human and hardware combination responsible for originating, controlling, and processing signals over the cable system.*

Another important cable system component is the *distribution system,* which disperses the programming. The main part of the distribution system is the cable itself. A coaxial cable (Figure 6–4), which is used in most cable systems, consists of an inner metal conductor shielded by a

Figure 6–3 Critical to the effective operation of the cable system is the master antenna. Often located on mountain tops and in rough terrain, constructing the antenna can be dangerous and expensive. (NCTA)

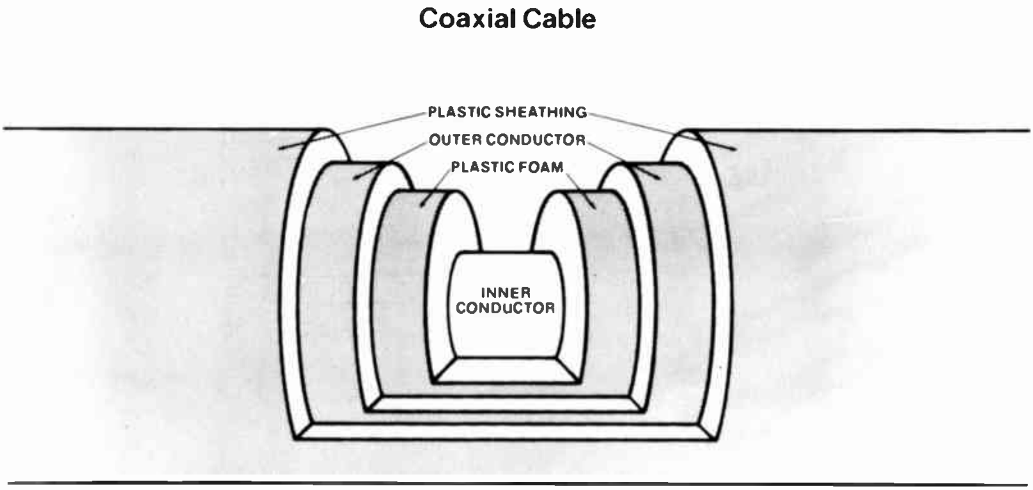


Figure 6–4 (NCTA)

plastic foam. The foam is then covered with another metal conductor, and that, in turn, is covered by plastic sheathing. This protected cable may either be strung on utility poles or buried underground. The primary cable, or main transmission line, is called the *trunk cable.* It usually follows the main traffic arteries of a city, branching off into a series of smaller feeder cables, also called sub-trunks. The feeder cables usually travel into side streets or into apartment complexes.

The actual connection to the home is made with a *drop cable.* This coaxial cable goes directly into the house where it connects with a *home terminal.* The home terminal, in turn, connects directly to the back of the television set. In most cable systems, the home terminal is simply a splicing connector that adapts the drop cable to a two-wire connector which fits onto the two screws on the back of every television set. In two-way cable, which we shall learn about next, the home terminal is more complex and may even include a small keyboard (Figure 6–5). Some cable systems install these more sophisticated home terminals even though two-way cable may not be operative yet on the system. When it does become operative, the system and the subscriber will be ready.

two-way cable television

Two-way cable systems, sometimes called two-way interactive television, permit the subscriber to feed back information to the head end. They are quickly becoming popular, and two-way is able to bring a wide variety of services into the home (Figure 6–6).

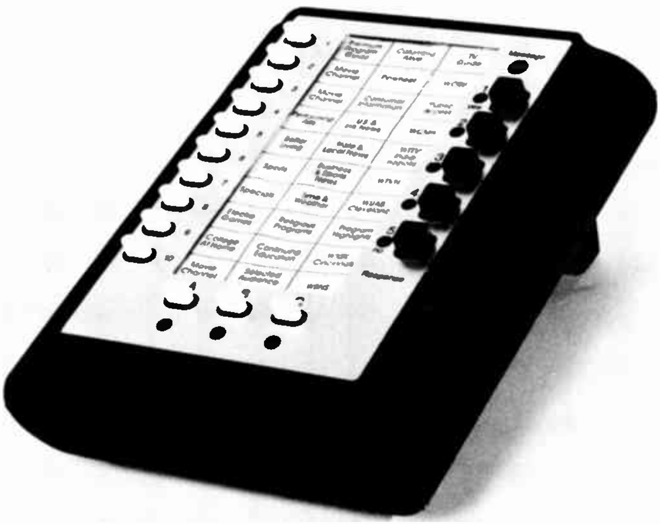


Figure 6–5 Warner Cable's 30-channel home terminal, which enables participation from the home in a variety of television programs such as interactive games, educational tests, and public opinion surveys. The terminal, connected to the subscriber's television set, is activated by pressing the program channel choices. (Warner Cable of Columbus, Inc.)

Application to Instructional Television

Two-way cable can also be applied to home instruction programs. For example, a handicapped child who cannot attend regular school can receive lessons at home via two-way cable television. The program reaches the two-way subscriber in the same manner as it would on one-way cable systems. However, the student can communicate with the teacher using a feedback loop. Feedback loops are generally of three types (Figure 6–7). One is a single cable used for both transmitting to and receiving information from the subscriber. Another uses two separate cables. Incoming signals reach the subscriber through one cable, and outgoing signals return from the subscriber to the head end using the second cable. A third is called a round robin cable loop, an adaption of single cable but with separate drop cables.

In our example of instructional television, special questions appear on the screen at regular intervals in the program. The student answers the questions on his or her home terminal, which can be as complex as a typewriter keyboard or as simple as a touch-tone telephone. The home terminal is hooked into a central computer, which aids the instructional

Two-Way Cable Transmission Techniques

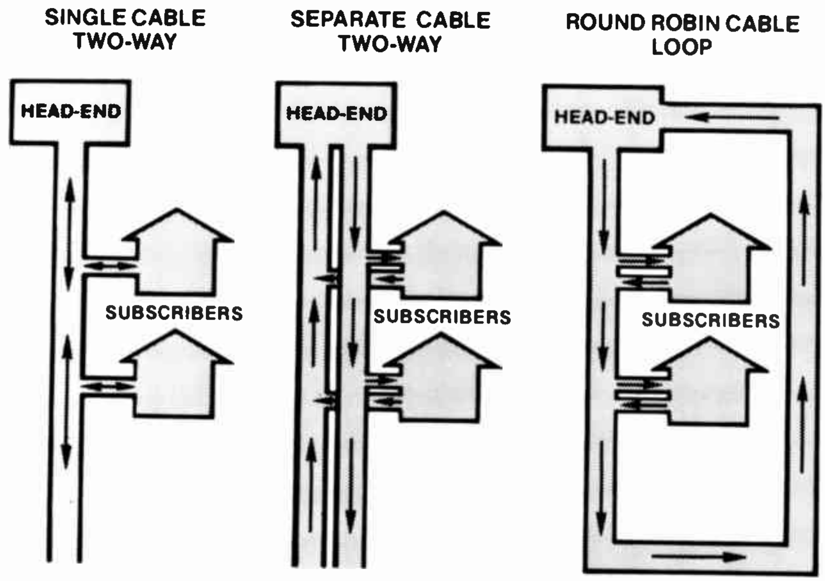


Figure 6–6 (NCTA)

process in two ways. First, it notifies the student if he or she has selected the right answer. Secondly, it tells the instructor how many students have selected the right answer. If the proportion of correct answers is low, the instructor can repeat the lesson. We shall learn more about this process in the chapters on educational and industrial television and feedback.

Industry and Consumer Resistance to Two-Way Cable

Although there are many advantages of two-way cable, there is still considerable resistance to the concept. Some is financial. The cost of two-way cable systems is much greater than that of one-way systems. The advanced computer technology, sophisticated home terminals, and other necessary hardware add up to more expensive subscriber fees. Consequently, businesses and institutions have become two-way cable's heaviest users, and even they use it only to transmit data.

There ~~also is fear of the unknown. Two-way cable~~ conjures up images of privacy invasion and "Big Brother." The thought of your living room being hooked up ~~to a central computer~~ has given some people doubts about the whole ~~process. The future~~ of the system will depend on being

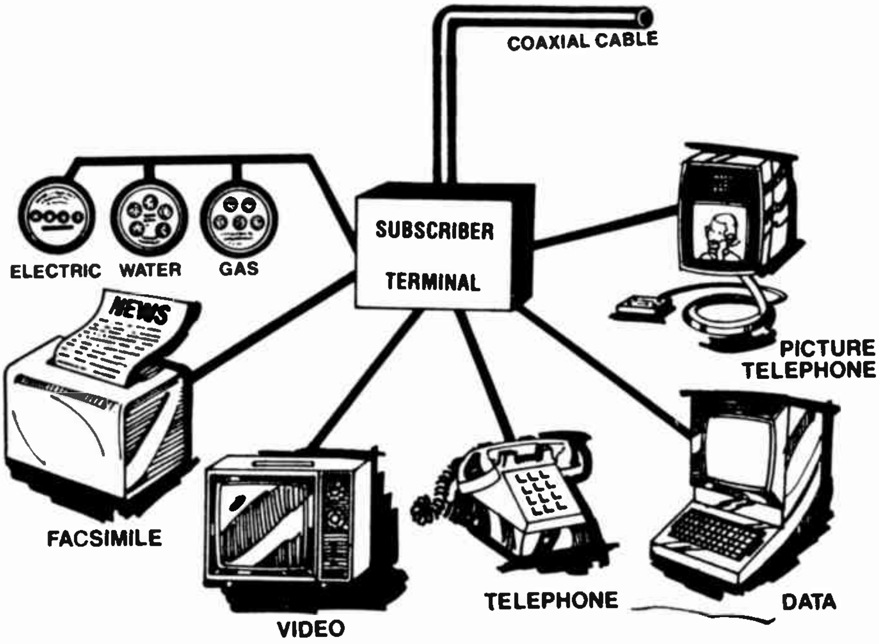


Figure 6–7 Cable's multiple uses beyond television programming can include such services as reading utility meters, in-home electronic newspapers, telephone, data, and picture telephone. (Communications News)

able to alleviate this apprehension and making two-way cable economically feasible for widespread use by the general public.

pay cable

Pay cable is defined as *the delivery of information and/or services to cable subscribers by assessing fees beyond the regular rental fee*. Pay cable should not be confused with "subscription TV," or "pay TV," terms defining a special over-the-air TV distribution system where the signal is "scrambled" as it leaves the transmitter and is descrambled using a special device on the home receiving set. The advantage of pay cable is the opportunity to see first-run movies, exclusive viewings of major sports events, and other special entertainment programs. Overall, pay cable has not been tremendously successful. Only within the hotel-motel industry is it gaining wide acceptance. Part of the problem is in the necessity of charging additional fees for programs, fees which the public has not been willing to pay, especially when there is a rich diet of alternative programming. This does not, however, mean that pay cable has no future. Alternative services such as data processing may revitalize the pay cable concept.

Pay Cable Connection Arrangements

People can subscribe to pay cable in a number of ways. The simplest is to pay a monthly fee to the cable company in order to receive a special channel of exclusive programming. The subscriber pays this set fee regardless of how much he or she views the pay cable channel. Or the subscriber can pay on a per-program basis. In this system, some type of two-way capability is necessary so that the subscriber can signal the cable company to send the desired program into his or her home. A credit card inserted into a special home terminal to signal the cable company is one method.

Arguments for and against Pay Cable

One of the main arguments in favor of pay cable is its ability to broadcast to small select audiences, something over-the-air broadcast stations cannot do. The problem is economic. To obtain profitable advertising revenue, over-the-air station programming must attract audiences in the millions, especially network programming. Programs which cannot achieve this type of saturation are simply kept off the air. Fine arts programming, educational programs, and similar fare are on what the pay-cable proponents base their appeals. By charging for the programs, the need for advertising revenue on pay cable is eliminated, or at least substantially reduced.

There also are arguments against pay cable. Commercial broadcasters charge that pay cable destroys the free system of broadcasting upon which the nation's broadcast communication systems were built. Other groups claim that pay cable discriminates against the poor who cannot afford the additional rates. The opposing arguments intensify with suggestions that pay cable could make exclusive contracts with program producers, placing programs on pay cable which would normally have attracted an audience large enough to warrant airing them on over-the-air broadcast stations. That suggestion makes commercial broadcasters bristle.

Theater owners showing first-run movies have still another argument against pay cable. They contend that when first-run movies are made available through pay cable, people will stay at home and watch them instead of going to the neighborhood movie theater. Examples supporting and denying these contentions are used by both proponents and opponents of pay cable.

cable radio

Television is not the only medium channeled by cable systems. This wired concept also applies to radio. The principle for cable radio is the same as it is for television. Distant station programming is cabled into a local community. As expected, commercial radio broadcasters vehemently oppose cable radio. Radio is a very local medium. When a small community's cable system imports one or more stations from outside the local market, the radio broadcaster feels the economic pinch. The importation usually translates into a reduced audience and consequently, reduced advertising dollars. The problem is not as serious for television since many communities do not have local television. But few do not have local radio stations. To compensate for this, the FCC has strongly suggested that cable operators not import radio signals from more than 75 miles away into markets of less than 50,000 persons. But so far, it is only a suggestion.

the potential for programming

The ~~most obvious~~ advantage of cable is the ~~increased selection~~ of ~~programming channels that it offers~~. Even though a community may have a wide selection of local channels, channels from neighboring communities can be "cabled" in, enabling residents to see independent stations' top-rated syndicated programming. The fine arts programming of an area's public television station can also be "cabled" in. Major sports events not carried on local stations can also be made available through cable.

Instructional Television through Cable

Cable companies often contract with a local university to fill one of its cable channels with instructional programming. Under these agreements, the university can offer a complete curriculum with a wide variety of courses that can be taken in the living room instead of in the classroom. The continuing education and outreach functions of colleges thus gain a whole new perspective through cable. Students can enroll in one college while taking courses by cable television from another. Theoretically, as we creep toward the new wired-nation concept, colleges could even become specialized in one type of instruction which is "syndicated" beyond the local campus. For instance, a school in New Mexico could use cable and national satellite hookups to teach Indian culture. Or a school in Wyoming could offer courses in mining economics.

Colleges and universities are not the only educational institutions in cable television.[3] High schools have produced programs explaining school activities, which they then air over the local cable system for the parents' benefit. Special programs for classroom use are also shown over cable systems, permitting taxpayers to see what is being done with their tax money. Schools even use the local cable system for such highly specialized programming as drug education. High-school sports programs are also broadcast on cable.

Cable is also becoming a means of communication among individuals and institutions which in the past have been distant, making communication impossible. The public that looks inside a school building, watches teacher-training programs, and hears school officials discuss issues learns more about and participates more in the institution. This social and political responsiveness, in turn, permits the school officials to be more accountable to those forces affecting policy.

Programming the Arts

Perhaps one of the greatest potentials of cable is in performing arts programming. In the past, commercial broadcasting has not been able to program the arts successfully for two reasons. The first was the lack of viewers for such specialized programming. The second was caused by the first, an inadequate profit foundation upon which to produce and program these shows. Although public broadcasting has inched toward this type of programming, it still must produce programs which appeal to a mass audience. Cable provides the alternative. Now local fine arts programming can be produced and funded on a local level.

Fine arts programming provides another benefit for cable. If a city has a good local symphony orchestra, for instance, a group of local sponsors and friends of the arts often contribute to its development with considerable zeal. This can spill over into the cable system. The local symphony can play to its audience over cable even during prime-time hours. On a commercial broadcasting station, the only profitable time to air such programming might be in the wee hours of the morning. Exceptionally good fine arts programming even can be duplicated and syndicated to other cable systems.

cable television and the political process

Along with education and the fine arts, cable has provided new opportunities for citizen interaction with the political process.

Broadcasting Public Meetings

School officials becoming accountable to community forces is just one example of this political involvement. Cable gives the public access even to the smallest governmental body. Television cameras and microphones can be in the audience of a school board meeting, a city council meeting, or a zoning commission meeting. Experience has also shown that live cablecasting of such meetings has increased attendance. Those with an active interest attend the meetings in person, and those with a borderline interest watch from home.[4]

Candidate Access

Commercial broadcasting, and to some extent public broadcasting, is limited in the amount of advertising time which can be given to candidates for political office. It is just not economically feasible to turn a station's complete advertising availabilities over to the politicians. The reason for this is that the FCC has decreed that political advertising be sold at the lowest rate the station charges to an advertiser. Although this helps politicians with scanty campaign coffers to obtain valuable television exposure, the procedure is not the favorite rule of commercial broadcasters. Some stations simply appropriate an amount of free time to candidates and dispense with selling political advertising altogether. In addition, election laws now restrict campaign financing. These have substantially trimmed candidates' budgets, budgets which used to produce lucrative television campaigns.

Cable television provides a number of alternatives to these dilemmas. First, in small communities without a television station, cable television permits candidates to reach the voters through a visual medium. Second, most local access rates permit even the candidate running for dog catcher of Possum Hollow to campaign on the local cable channel. Third, when commercial availabilities are not open, cable availabilities may be. Fourth, cable permits the candidates to reach highly specialized audiences not normally reached by commercial television. In short, cable is helping our society recapture the old-fashioned, town-meeting approach common to democracy yet difficult to attain in our modern age.

cable's local access concept

Most cable systems allow any member of the public access to a cable channel. We shall learn why some of them don't and the regulations accompanying cable in chapter 15. Some larger cable systems also provide, at a nominal cost, equipment for people to produce local programming. Let's look at a local example.

An Example of Applied Local Access

Local access programming is not the glittering lights of Hollywood. Nor is it the elaborate production studios of a major network. It more than likely materializes as this one did, on a October day in a small community of 8,000 people and 1,500 local cable subscribers. It is evening, and on a drive in the country, a local resident spots a poster tacked to a utility pole. "Halloween Parade—Everyone Welcome—6:30 P.M., October 31, The Fire House Parking Lot." The perfect opportunity for local-access programming. The next morning, a call to the local cable company produces the name of a student at the nearby college in charge of cable equipment available for public use. The cost is minimal.

A second telephone reveals that two small, portable, black and white cameras, a videotape recorder, and a switching unit are available.

"We can set them up in the alley behind the firehouse. That's where the parade starts."

"What about lights and electricity?"

"Whoops, I never thought of that."

Time to check with the fire department. Another telephone call . . .

At 6:30 P.M., the parking lot is filled with children. Costumes are everywhere. A hay wagon is in position with the parade's director and her megaphone astride. The children line up to march around the block and back into the parking lot for an awards ceremony. Wait a minute. The light from the fire department isn't enough. Time to move some cars into position. Park some at the head of the alley and turn the headlights on high beam. It works; we're ready to go. Lights, cameras, action, the parade is on! A few hours later, the 90-minute production of the parade and the awards ceremony is seen over the local cable channel. A full-scale television production? No, but to the parade participants it was just as exciting. For the parents and children who participated, they'll remember that Halloween for a long time to come.

The above example is what local access television really is. It is the grassroots side of mass media not possible with standard broadcasting stations. Creative opportunities on many cable systems await not the seasoned professional, but *the amateur citizen.*

Local Access and Specialized Audiences

One advantage of cable is its ability to reach specialized audiences. In Philadelphia, for example, as part of the cable company hardware capability, a series of "mini-hubs" brings new concepts in cable programming.[5] The mini-hub is a series of local origination points along the cable route. With this, cable programming can be limited to a few city blocks. Then, perhaps three blocks away, there is another program from another mini-hub. This highly localized access concept permits programming to small neighborhoods which might have similar ethnic or religious backgrounds or other common ties.

Another example of local-access programming to specialized audiences is programming for the elderly. Cable is connected to living complexes for the elderly such as nursing homes. It is popular with the elderly because of the added leisure time retirement permits. Local access cable programming permits the elderly to "communicate" with each other, alleviate loneliness, and feel more a part of the community. Special programs about social security benefits, Medicare information, transportation, shopping bargains for senior citizens, and similar offerings all are possible through local-access cable programming.

Issues Facing Local Access

Up to this point, our discussion about cable television has been positive. Instructional television (ITV) programming, the fine arts, cable in the political process, and reaching specialized audiences all are beneficial. But not everything is this positive, and the local-access concept is perhaps the least so.

The major problem of local-access television is that its viewing audience has been difficult to measure. Where major commercial rating services are employed, the local-access channel is not usually included in their survey measurements. When audience measurements have been taken, they have shown very few viewers. A research study by the Institute for Communication Research at Indiana University sampled the television viewing habits of the community of Columbus, Indiana.[6] Results showed that "the total public-access viewing time, for all persons in the sample, was two tenths of 1 percent (.2 percent) of the total of all television viewing for the week."[7] Explanations of the small audience were a lack of promotion by the cable company, "causal" scheduling which included intermittent programming, blacked-out periods, and perhaps sampling error. However, a promotional campaign did slightly increase subsequent viewer levels.[8]

Another problem area for local-access television is the programming itself. Pamela Doty, a researcher for the Center for Policy Research in New York, spent two months viewing local-access channels in New York.[9] Because local-access programming did not expect a mass audience nor did it need advertising revenue, she felt she would find a "higher percentage of hard-hitting social criticism and controversy" on local-access channels than on typical commercial television. This was not the case. She found it was "rare to see a debate or dialogue between two persons who even mildly disagree, let alone have major differences."[10] Moreover, the rather bland format of people sitting around a coffee table talking to each other, the "talking heads" format, on local-access channels, was rather boring.

Doty's recommendations for improving local-access programming include true debating of local issues, "explorational tours" of communities with "behind-the-scenes" glimpses, and programs showing the audience how to edit videotape. She also states that the public access users need to develop a clear-cut sense of what they want their programs to accomplish and how to go about it in such a way that interests the audience they want to reach.[11] When done properly, local-access programming has great potential. We have already learned about programming the local symphony. Other special events such as Little League baseball, children's parades, community fairs, picnics, church services, and others can fill a cable system's programming schedule.

cable versus the broadcaster

With cable's ability to carry broadcast messages beyond the coverage area of the over-the-air station, it would seem that broadcasters would support cable's efforts more. But the two have seldom coexisted harmoniously, and at times their opposition has been bitter. We shall examine both the broadcasters' and the cable operators' arguments. Each has valid points. It is up to the regulatory bodies to judge which will prevail.

The Broadcaster's Arguments

Place yourself in the position of a commercial broadcaster in a medium-sized community. You are against cable. The main lobbying group for your position is the National Association of Broadcasters. You, yourself, give your arguments everywhere from the FCC to your local city council. What are these arguments?

The strongest argument is economic. The importation of broadcast signals slashes your audience. You used to be able to offer a substantial audience to advertisers for a healthy profit. Second, you are charged copyright fees for certain programs, yet a cable operator can rebroadcast those same programs without paying them. "That's fair?" you exclaim. Third, you, as a broadcaster, are serving the public's interest, convenience, and necessity, and are providing that service free of charge to the viewer. On the other hand, a large interconnection of cable systems can successfully negotiate exclusive programming with a college football team, for example, and charge viewers to see the games. You, in turn, because of the cable systems' exclusive contract, would not be permitted to carry the game. "Outrageous!" you fume. Fourth, economics usually dictates that cable be installed only in densely populated areas with the most subscribers, especially pay TV. Yet you, while competing with cable, are also serving the rural public, regardless of the population density.

Your fifth, but more general argument, is that cable has developed as a parasite industry of broadcasting and now is trying to compete with it. Sixth, you argue that cable has been favored by the FCC with a general relaxation of rules, thus permitting it to compete better with you. You compare this to fighting with one hand tied behind your back while your opponent's hands are free. Seventh, since cable companies have the ability to interconnect among systems, you claim that the theory of local accountability and service has been destroyed. Eighth, while you operate on a limited spectrum space, cable can carry large numbers of channels, many of them programmed by the local cable systems themselves.

Some of these arguments are good; others are not. Nevertheless, the broadcasting industry is quite concerned about cable.

Cable's Rebuttal

Now put yourself in the cable operator's position. Your major lobbying or~~ganization is the National Cable Television Association. You, too~~, take your case before any interested body. How would you argue?

First, you contend that over-the-air broadcasters are severely restricted in servin~~g their viewing~~ audiences, since even in the largest markets, only a few stations can operate within a ~~limited spec~~trum space. You feel that cable serves its audiences far better with its variety of channels. Second, you point out that precisely because of their limited spectrum space, broadcasters have made giant profits. You state that those profits are sometimes at the expense of viewers, who long for more innovative, perhaps more costly, programming. Third, restricting legislation, you argue, means that cable has not been able to build a similarly firm financial base. Fourth, while still on the subject of regulation, you argue the cable industry is regulated by legislation designed to protect the broadcaster, the Communications Act of 1934 being the principal example. This envisions a system of over-the-air broadcasting. Even amendments to this act can control cable. Fifth, when broadcasters criticize cable's exclusive contracts with program distributors, you remind them of their exclusive con~~tract advantage~~ with the major networks. Sixth, although commercial ~~broadcasters~~ answer to only one master, the FCC, you face regulatory control by three levels ~~of~~ government—local, state, and ~~national. "Is all~~ of this fair?" you ask.

All of these arguments, in varying degrees of detail and intensity, are used throughout the broadcasting and cable industries. They have been presented in cloakrooms to members of Congress, at special legislative hearings, and in public relations literature. Meanwhile, mass consumers are living in both worlds, unaware that the future is bound to bring some dramatic changes in how we receive our daily television fare.

Healing the Split

Despite all the rivalry and rhetoric, broadcasters and cable operators must begin to consider how each can complement the other in a common goal. Increasingly, new developments in telecommunication are drawing the two out of their warring camps. Television stations broadcasting by satellite to distant cable systems when both are operated by the same company find it awkward to cut the other's throat. Still, with powerful lobbying groups like the NAB and the NCTA, the chasm will not be bridged overnight.

A call for unity has come from Clifford M. Kirtland, Jr., president of Cox Broadcasting Corporation, which has holdings in both cable and broadcasting stations. Addressing a meeting of the Institute of Financial Management, Kirtland states he feels there needs to be "a recognition by all broadcasters, cable operators, and producers of programming that the viewer and listener in the home are *not* served by high-toned rhetoric lambasting the opposition and feeding the critics. What is needed is a recognition that—even after all the compromises, rule changes, technological changes, and criticism from all sides— the audience today is better served then ever before." He concludes: "Perhaps a greater spirit of cooperation among all parties working toward balanced regulations in a positive way . . . a greater acceptance of technological change . . . and a greater reliance on the free enterprise system to work its wonders . . . will, by 1985, further enhance the total communication service of our country."[12]

It is difficult to predict what future scenario will bring cable operators and broadcasters together. Perhaps a regulatory issue demanding common lobbying efforts, or perhaps a foreign competitor beaming signals into North American living rooms may turn the tide. For now, both are working feverishly to protect their individual economic domains.

cable's future: the major issues

Despite the respectable growth and impact of cable, it is in its infancy as a technological and social force. Standard broadcasting, both in size and influence, makes cable minute in comparison. Still, it is a force with which to be reckoned. Let's briefly examine some of the issues pertaining to its future. A more detailed discussion of these issues is found in other chapters of this text.

Regulatory Considerations

The cable industry looked forward to the rewriting of the Communications Act of 1934. Cable is the stepchild of that piece of legislation. Although legislation regulating cable was added to the act, those regulations have been greatly tempered by the strong lobbying efforts of commercial broadcasting organizations. Many cable operators feel that wiping the slate clean and starting over would give cable a better footing.

Besides the federal regulatory stance is the influence of state and local governmental bodies. Here, cable suffers a decisive disadvantage over commercial broadcasters. A cable system can find itself regulated by three systems—local, state and federal. Standard broadcasters answer only to the FCC. To make matters worse, some regulations actually conflict with each other, creating a maze of court-cases ranging anywhere from rate structures to local-access programming. Directly related to these problems is the futility of trying to regulate, on the basis of state and local boundaries, a communications system that transcends boundaries. For example, communications attorney Anne W. Branscomb, using New York as an example, feels that the New York metropolitan area should coordinate its telecommunications planning and development with New Jersey and Connecticut, rather than with New York State.[13]

Cable's Interference with Legal Precedent

Another problem cable faces is its relationship with laws indirectly affecting its operation. Consider the case of local-access. A local community group decides it wants to use the local-access channel to broadcast the school board meeting live and in its entirety. The state's open-meetings law permits public access to all public meetings. But the school board says no. The school board's attorney contends that cable television cameras are not people and therefore can be barred. The community group reminds the school board that it permits the local television station to film and videotape portions of its meetings. In fact, when major issues are being discussed, the board even allows the station to broadcast live, mini-cam reports. But the school board replies that cable is not considered a bona fide news gathering organization and does not come under the protection of a free press.

This is just one of many "gray" areas cable faces. Many laws, such as open meetings statutes and reporters' shield laws, have yet to define their applicability to these situations. Until they do, cable has an uphill climb for its legal identity.

fiber optics

Whatever policy decisions are made on cable, their full social implications will be felt only when there is widespread use of fiber optics. Fiber optics, as we have already learned, are thin strands of glass fiber through which light passes. This light, which travels at a very high frequency on the electromagnetic spectrum, carries the broadcast signals (Figure 6–8). The use of fiber optics will dramatically increase the amount of information that can be carried on any single cable system. The thought of 1,000 cable channels on a single glass fiber boggles the mind.

Telephone Companies: A Competitive Edge?

Control of something usually gives power to the controller. It is no different with fiber optics. This time, the telephone companies could be in the driver's seat. Before development of fiber optics, only the cable companies had a channel capacity large enough to transmit and receive computer data directly into the home. The telephone company's home hookups just were not satisfactory for transferring those large amounts of information. Fiber optics has changed all of that. In its report on the future of telecommunications policy, the research firm of Arthur D. Little, Inc. stated that, "current research into the use of fiber optics would lead to telephone companies becoming the most logical providers of home television access in the long term."[14] Remember that the telephone companies already have an established system of installation much larger than that of the entire cable industry. Their personnel, equipment, and

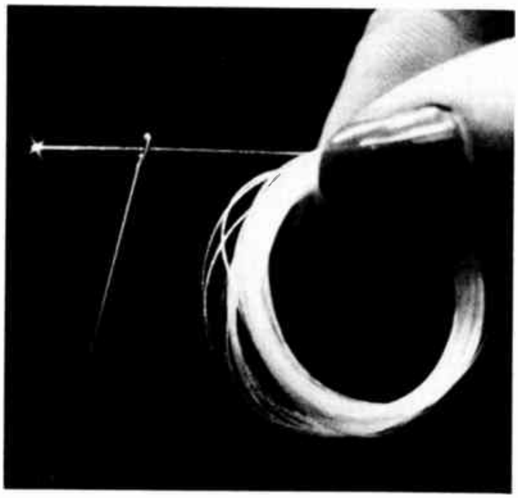


Figure 6–8 Tiny strands of glass can carry thousands of channels in the space coaxial cable fills. (Western Electric)

even utility poles are ready now to install fiber optics in any home, anywhere.

A future scenario even envisions telephone companies with their own television stations and networks feeding a "wired nation" as today's cable operators do, only on an extremely small scale. The social implications of such a phenomenon are far-reaching. How would the computer of the future adapt to such a system? Behavioral scientists are currently studying how children are affected by constant association with television from birth. What will be the future of fiber optics and its ability to adapt in-the-home computer technology to television? Children may grow up not only watching television but also "communicating" with a central computer which continually processes and adapts to his or her programming likes and dislikes. It is all possible with the increased channel capacity that fiber optics offers. A future educational program may project a math instructor to a national viewing audience with individual computer terminals, enabling them to work the problems at home. At the same time, the math instructor could look at the computerized results on his or her computer terminal and determine thousands of miles away how well the lesson is being understood.

The Future Transition

The future influence of fiber optics is not clear. It definitely has renewed interest in CATV, especially by the telephone companies which were at a disadvantage because of the inability of home telephone wires to carry multiple television channels. Both the cable industry and the telephone companies are interested in the transmission of data communications, such as connecting two distant computers, to which fiber optics will be essential.

Economics will partially dictate the future. Although AT&T has fiber optics at its disposal, it has already invested close to $60 billion in its current hookup system. Converting to the new fiber optics hardware, depreciating the $60 billion loss, and amortizing the debt for new development could put the cost of this new technology to the consumer out of reach. In short, for the telephone company, a short-range shift to fiber optics could be prohibitively expensive.

the economics of cable

The future of cable and how we interact with and use it is directly tied to its economic issues. It is important to understand them. You may find yourself voting in a local referendum to raise the rates for your local cable system. Or your community may determine whether the local cable company should install its cable underground or, more economically, attach it to telephone poles. It may even decide what supplementary services, such as electronic funds transfer or bank-from-home services, should be added to the local television fare. To make intelligent decisions, you will need to understand the economic forces affecting cable.

The Capital-Intensive Factor

Cable is a capital-intensive business. By capital intensive, we mean that maximum costs occur immediately. A standard radio or television station can go on the air with a minimum amount of equipment, some of marginal quality, and a skeleton staff. Cable does not enjoy this luxury. Cable systems are designed for permanency, and the system must be taken to the total potential audience before it can even begin operation. Therefore, hiring skilled technicians, installing miles of cable, requiring elaborate antenna systems, purchasing head end equipment, and incurring similar expenses must all be done before the first subscriber is hooked on.

Construction Costs

Starting a cable system requires planning construction of the head end and production facilities, the distribution plant, subscriber equipment, and preoperating expenses.[15] Costs for underground construction of the distribution system can run as high as $60,000 per mile in crowded metropolitan centers. Some radio stations have gone on the air for less. Even above-ground pole attachment systems are conservatively estimated by operators at $50,000 per mile. The location and type of antenna can also raise the cost. An antenna that must be constructed on top of a mountain is going to cost much more than a tower built in a level field outside of town. A head end with production facilities for locally originated programming is going to cost more than one without local production capabilities. All of this determines how much the subscriber must be charged, how long it will be before the cable system makes a profit, where financing can be obtained, how high the interest rate will be, and whether it is economically feasible to construct the system at all.

Operating Costs

Construction costs are followed by the costs of operating the cable system. The main cost is system maintenance. Although cable operators usually install the best possible equipment for long life and maintenance-free service, nothing is infallible. Breaks due to storms and equipment repair at the head end are just part of the regular maintenance schedule. Second, a subscriber cannot simply turn on a television set and tune to the cable channel without first having the set connected to the cable. That requires a service call, and service calls are responsible for much of the cable company's personnel time.

A third expense is vehicle operation. Unlike a radio or television station which may have its entire operation under one roof, the cable company literally can be spread all over town. Servicing this territory in larger markets can require an entire fleet of trucks, many with aerial ladders. Because of the high price of gasoline, this is a spiraling cost for the cable system. Future developments in technology, however, will permit more and more switching and connecting functions to be done at the cable head end.

Fourth, utility pole and underground duct rentals are a large expense for the cable system. For example, if pole attachments are used, the cable company must rent them from the telephone company, and this can cause strained relations between the two. Pole attachments cost an average of $4.00 to $5.00 per year.[17] Although that may not sound like much, it is almost equivalent to a monthly cable subscription fee. When a major cable company like TelePrompTer rents more than 800,000 poles, the cost is considerable.

Fifth, operating costs continue. Local municipalities may charge franchise fees, money the cable company pays the local government for the privilege of operating. Sixth, cable companies may be charged copyright fees by program distributors. Seventh, although construction of the antenna and other head end facilities is usually figured into the construction costs, the cost to bring in distant signals may require separate lease agreements with telephone companies or private microwave carriers. Eighth, local origination costs also can be substantial. Here a local cable company can incur some of the same studio expenses as a small television station does. Although it can boadcast with black and white equipment, color capabilities help to develop programming which can successfully compete for viewers of other channels. This does not mean that high quality black and white programming with special local appeal cannot be successful. With local meetings, special seminars, and similar "individualized" programming, the interest will be high no matter what the quality of production is.

Income from the Cable System

For the cable company to make a profit, it must receive income in the form of subscriber fees. The number of subscribers and the amount of the fees are the key components. Most subscribers pay approximately $12 per month for all cable services. That may include additional fees for pay TV programs, such special services as electronic funds transfer, or even two-way, interactive instructional television programming. As the variety of these services increases, the subscriber fee increases. Research by Cox Broadcasting has predicted that by 1985, the amount paid by a subscriber for all types of cable services could be $17.00 per month (Figure 6–9).[18]

Subscriber fees are not the only source of cable's revenue. Another is advertising. Cable companies have been successful in selling advertising in the same way that standard broadcasting stations do. Moreover, the interconnection between cable systems through satellite and microwave makes the concept of a cable network a working reality. In a network, a group of cable companies joins together to carry the same programming, deriving income from sponsors who buy advertising seen throughout the entire cable network. As these cable networks develop, a larger percentage of cable's income will come from advertising (Figure 6–10). Predictions by researchers for Cox Broadcasting place advertising revenue at 10 percent of cable's total revenue by 1985, an increase of 100 percent over 1980 figures.[19] Pay cable revenue is based on a figure of 20 percent of total cable revenue in 1980 to 30 percent in 1985.

In summary, income from the cable system is classified into four broad categories: (1) subscribers' monthly rental fees for standard television

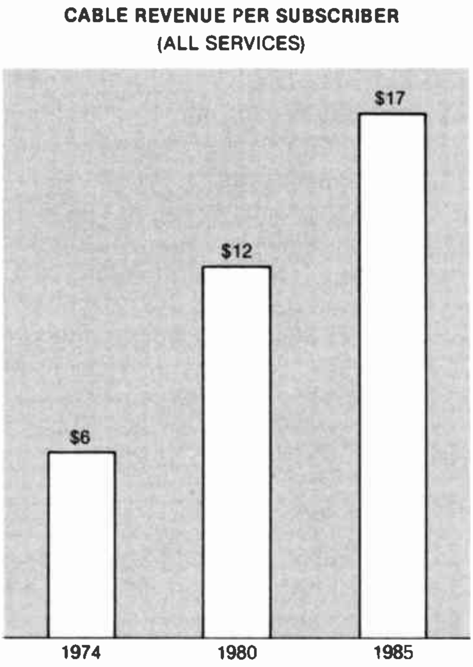


Figure 6–9 (Cox Broadcasting Corporation)

DISTRIBUTION OF CABLE REVENUE

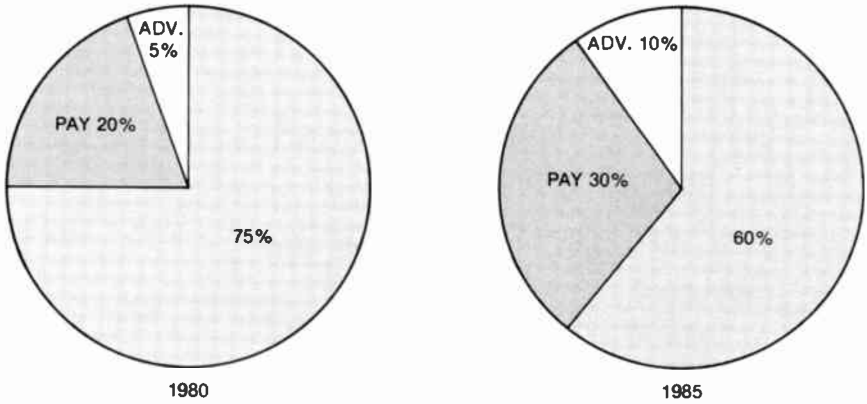


Figure 6–10 (Cox Broadcasting Corporation)

services; (2) pay cable fees for special programming, much of it exclusive, which is usually either a set charge above the regular monthly rental fee, or an individual, per-program assessment; (3) revenue from such special services as at-home banking; and (4) revenue from advertising.

Approaching the Profit Margin

A cable system has no set formula for success. But the enterprising operator does follow some basic guidelines. Among them is the delicate balance between the amount of money that can be charged to a subscriber and the number of subscribers needed to make the system profitable. For example, if a cable system has 1,000 subscribers, each of whom pays a $10 monthly subscription fee, the total income would be $10,000 per month (if there is no income from other revenue sources). Now we will assume that the cable operator decides to increase the subscription rate to $12 per month. Theoretically, this raise would net the company $12,000 per month. But what if the rate increase drove away 200 current subscribers? The income to the cable operator would then drop to $9,600 per month (12 x 800), a loss of $400 per month.

Another economic balance for the cable operator is between the amount of the original construction cost and the number of subscribers necessary to equalize that cost. The key here is subscriber cost, not to be confused with the subscription fee. Subscriber cost is what the "cable operator must obtain in revenues in order for the system to operate at a profit."[20] The more subscribers there are, the less the subscriber cost needs to be.

To understand this principle, consider the following example of

Rolland C. Johnson and Robert T. Blau in their report on a consulting project with an Indiana cable company. Imagine that a city of 40,000 people with 10,000 homes (100 homes per mile) grants a cable television franchise. A cable operator is able to construct the entire system for $1 million, including 100 miles of cable, head end, and miscellaneous costs. At the end of one year, let us assume that 1,000 homes (10 percent of the total) are being served. At this point, the cost per subscriber is $1,000 ($1 million ÷ 1,000)—drop costs are assumed to be covered by installation fees. During the second year, an additional 1,500 homes subscribe, and the cable operator now has 2,500 subscribers, or one-fourth of the total potential. Per subscriber cost is now only $400. If, at the end of ten years, 80 percent (or 8,000 homes) of the community is served, per-subscriber costs drop to $125 (assuming the critical equipment is still in working order).[21]

The above example is hypothetical. *Actual situations include a number of variables.* New independent television stations may be constructed, which beam clear signals into the areas already served by the cable. Or the potential for large subscriber blocks, such as apartment houses, may vanish when a landlord decides to prohibit the cable company from hooking up to his or her complex. Even a competing cable company may appear on the scene. Such competition would have been unlikely a few years ago. Installing expensive lines along an existing cable route simply was not practical. But new technology has changed all that. A small satellite dish on the top of an apartment complex and its accompanying roof-to-residence cable hookups can turn the complex into an instant cable market. This comparatively inexpensive competitive system can upset the most solid projections for success.

Nevertheless, with the right marketing techniques, cable systems can do a sizeable business. A report by R. E. Park identifies the influences of subscriber penetration:

The more television stations of various types a cable system carries, the higher its saturation will be.

The fewer of each type of station receivable locally over the air, the higher the system's saturation will be.

The farther from the television transmitters the system is, the higher its saturation will be.

The more stations that broadcast on UHF rather than on VHF channels, the higher the system's saturation will be, because of a variety of reception and tuning problems in UHF stations.

The less the system charges for its services, the higher its saturation will be.

The higher the average income of households in the community

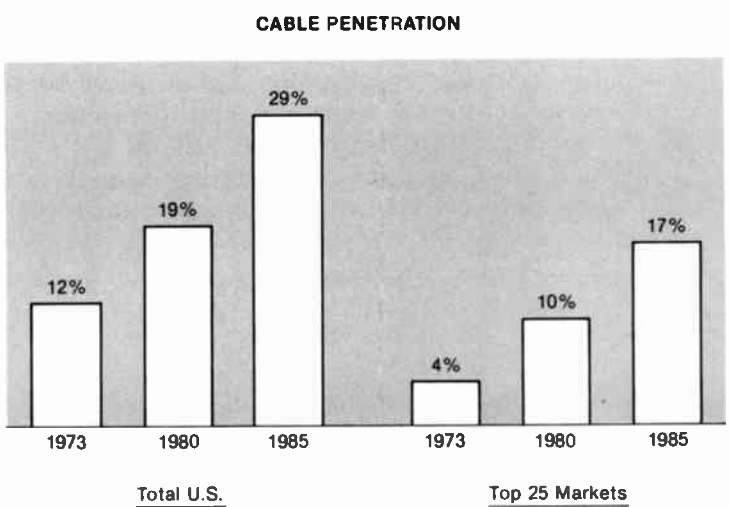
served by the system, the higher the system's saturation will be.
The older a system is, the higher its saturation will be.[22]

Park bases his conclusions on data from cable systems already in operation. Constantly changing technology and our own changing media-use habits require cautious optimism when using such data to predict success for all new cable systems.

Cable will certainly continue to grow as a viable medium. However, new technology may greatly change its current definition. The ability to beam broadcast signals directly to small satellite dish antennas positioned on rooftops may eliminate the actual "wires" used in current cable transmission. If the telephone companies gain, through regulatory protection, primary development and use of fiber optics technology, then they may become the cable companies of the future.

The research firm of Arthur D. Little, Inc. conducted an impact study on cable's outlook through 1985. The study predicts continued but slower growth in the early 1980s "as markets with limited over-the-air broadcast TV reception become saturated. New service options will be needed for further penetration of existing markets."[23] Predictions are "that in 1985, pay cable subscribers will number five to seven million and basic service subscribers 20–26 million, roughly 30 percent of the projected $4.8 million TV households." Arthur D. Little, Inc.'s projections are similar to those of Cox Broadcasting Corporation, which predicts cable penetration of the total United States population to reach 29 percent in 1985 and 17 percent in the top 25 markets (Figure 6–11).[24]

Figure 6–11 (Cox Broadcasting Corporation)



human implications of our cable environment

Before concluding our discussion of cable, it is appropriate to stop and ponder what this technology means to our human environment.

Civilization has developed and prospered partly because of its ability to originate and maintain systems of communication, not only between people but between cultures. Research has shown that we spend approximately six hours per day watching television. Although we may not be silent during television viewing periods, we are not communicating with others as much as we would during periods of conversation. We do have other opportunities during the day to participate in interpersonal relations. We may go to the grocery store, to the bank, or simply window-shop around our community or campus. In each instance, we are around other people. Walking between classes is a perfect time to greet those we meet on the sidewalks, and we love to converse with our friends in snackbars and coffee shops. In short, although many of us spend considerable time with television, we still spend a great deal of time communicating with other people.

Now project yourself into the future. The lure of television still attracts you, but it is joined by many more. Instead of taking a break between classes at the local coffee shop or walking across campus to attend another class, you spend the majority of the day in your room taking courses via cable television, from not one but four or five colleges around the country. Chemistry from the University of Washington, physics from the University of Notre Dame, English from the University of Texas, and geology from the University of North Carolina all would be part of your daily academic routine. The time you spent in front of a television screen theoretically could increase to twelve or more hours per day. Then there is shopping by cable, banking by cable, and endless other services by cable. What would be the psychological effect on people with this concentrated media interaction and human isolation?

As you learn about the economic, political, and technological development of broadcast communication, it is important to remember its effect upon the interrelationship with people and society.

summary

Cable television, also called CATV or community antenna television, was developed in the 1940s as a way of bringing distant television signals to outlying communities through use of a common or "community" antenna. The system consists of the head end and the distribution system, which is broken up into trunk cables, drop cables, and home terminals. The development of two-way cable has made possible such services as inter-

1

active instructional television. An offspring of cable is pay TV, which charges the subscriber an additional fee to see exclusive programming. Although it has had very strong resistance from standard broadcasters, even cable radio has developed on a limited scale.

Because of its revenue system, cable has the economic ability to reach much smaller, specialized audiences than over-the-air television, which must reach a large, mass audience in order to attract advertising dollars. Thus it can specialize in such programming as instructional, fine arts, and political. Although not fully utilized, local-access programming on cable permits even the average citizen to create television programming.

Cable has received strong opposition from organized groups of over-the-air broadcasters. They argue that cable has fragmented broadcast audiences and has developed as a competitive, parasite industry. The cable industry counters that it is overregulated and because of this, has not been able to build a strong financial base. Cable also faces major economic hurdles because of its capital-intensive nature. Although its future looks stable, we need to consider the human implications of our cable environment.

spotlight on further learning

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7

networks and syndication

FOCUS After completing this chapter, we should be able to

Discuss the concept of network programming, affiliate relations, and criticism of the network.

Explain the corporate development of ABC, CBS, and NBC.

List the businesses that comprise the networks' corporate structure.

Discuss contemporary radio networks.

Give examples of ethnic, educational, cable, and religious networks.

Explain how broadcast syndication functions as a network alternative.

Disucss the many facets of radio syndication.

Understand formàt control in syndicated programming.

List the reasons why the concept of a fourth network may someday be a reality.

ABC, CBS, NBC, and PBS—those magical initials of living room entertainment. We all have grown up with them, and they have shaped much of our lives. They still do. These are just the television networks. Radio has its own versions of national programming, followed by the syndicated networks. Major broadcasting networks are in most countries, the largest and most dominant systems of broadcasting. In this chapter, we shall view them as disseminators of information and as carriers of news and entertainment programming.[1]

the network concept

Networks not only provide the public with broadcast programming, but they also serve the advertiser and the broadcaster. For the advertiser, the networks provide a medium through which they can reach large numbers of people at economical rates. Even though the cost of a minute-long commercial on a major network can be staggering, the cost of reaching the same number of people through another medium, such as direct mail, would be far greater. Although direct mail can be used to reach a highly specialized audience, regional networks, a wide variety of programs, and selective scheduling of commercials help broadcasting remain competitive in reaching specialized audiences.

For the broadcaster, airing network programming is much more economical than the cost of producing and airing comparable local programming. In addition, affiliates usually receive compensation from the network for airing the programs.

Acquiring Programs

Within the networks, the news and public affairs units are responsible for informational programming. Supported by major staffs of reporters, producers, directors, and technicians, the units produce daily newscasts seen and heard by millions. They also provide special coverage of such important events as elections, inaugurations, press conferences, and space flights. The units offer special features and documentaries, which can range from a superficial look at a national fad to an investigative report of political corruption. Joint ~~cooperative documentaries~~ and reports with the networks' owned ~~and operated (O & O)~~ stations are still another source of network news ~~programming, as are reports contributed~~ by local affiliates.

Entertainment programming has another story. Here, various independent companies called *production houses* work closely with the networks to supply everything from detective thrillers to situation comedies. The ideas for programs come from the network, the production house, writers, or anyone else connected with the creative process. If a network is interested in an idea, both the network and the production house make a major investment to produce a pilot program. Audience reaction to the pilot program is then evaluated. If the ratings prove that it will be a hit, the production house moves into full-scale production. A complete season of shows is usually produced only after testing the program during a new television season to see whether its popularity will last more than a few weeks. Conversely, if the pilot is disappointing, the program may never get on the air. Other factors determining an air date may include affiliate reaction to a program, scheduling availabilities, and competition from other shows.

Affiliate Relations

How much attention do the networks really pay to their affiliates' wishes? On such major issues as clearing programming (agreeing to air a network program), the networks carefully heed them. This is a form of direct feedback, which is measured in terms of how many affiliates agree to carry the program, called *clearance ratios*.

Clearance ratios are critical to networks. If a group of stations decides not to carry a program, then the network's audience suffers, the ratings go down, and the advertising dollar follows. The clearance aspect of the network-affiliate relationship has taken on considerably more importance with the concern over violent and sexually explicit television programming. In many cases, local affiliate stations simply have refused to carry the network programs. In other cases, they have rescheduled the programming to a later hour when children will not be watching. Although that idea may sound reasonable, to a network, it can spell disaster since the late-night viewing audience is only a fraction of that in prime time. As a result of these continuing concerns, the *affiliate organizations* (also called advisory boards), groups of affiliate stations that elect a representative to carry their concerns to the network, are becoming increasingly important.

Affiliate Organizations

The organizations, some of which have grown out of advisory boards, have a set of bylaws and charge their members dues. There is no particular advantage of one over the other. Both function as feedback mechanisms to the network. Affiliates which do not wish to become part of the organization or advisory board still have a voice in the network.

No affiliate is overlooked. Each provides an audience for network programming and commercials. In some cases, the large-market affiliates purposely avoid belonging to the boards or organizations because they feel they have more impact as individual stations. In the same sense, some very small affiliates do not belong because they feel their voice is too small to be heard. These are the exceptions, not the rule. In theory, the affiliate organizations and advisory boards represent all of the affiliates.

The affiliates' organizations and advisory boards do not control the network directly, nor do they have any legal relationship beyond the contract between the network and the affiliate. The affiliates do, however, influence network decision making. Typically, the organizations and boards elect representatives from their membership, although some are appointed by the network. It then becomes the responsibility of the elected representatives to be the "voice" of the affiliates.

Voicing Affiliate Concerns

For example, imagine yourself an elected representative of a network affiliates' organization serving a group of states in the West. About two months before the network-affiliate representatives' meeting, you circulate a questionnaire to all of the affiliates asking them what information they want communicated to the network executives. You ask if they are satisfied with the quality of network programming, the scheduling of programming, whether they want more news and less sports or vice versa, and other pertinent information about the operation of their station, which is affected by their network affiliation. You also ask them to respond in a letter to any points not covered in the questionnaire. About a month before the meeting, you forward to the network a summary of the results.

At the meeting, the discussion centers on your summary and those provided by other representatives from around the country. One radio representative points out that many of the affiliates have a contemporary music format, and ten minutes of network news on the hour is hurting their listenership. On the other hand, the news and information affiliates love the ten minutes. The network must make a decision. It decides to continue to air ten minutes of network news every hour but to permit the stations with contemporary formats to cut out of the news at five minutes past the hour. The network will~~, however,~~ need to cut the *local availability,* ~~that commercial slot in the network feed that~~ *is sold locally by the station.* The contemporary affiliates do not mind. They are willing to sacrifice the commercial availability to return to musical programming and please their audience.

Or perhaps you are at a television affiliates' meeting when a representative, speaking for affiliates in a conservative part of the country, feels the sex and violence on network programming has become too explicit for the audience. Complaints continue to pour in to their stations from viewers and advertisers. The affiliates want something done to "clean up" the programming. Another representative from a large city is not quite as upset over the programming. She says the affiliates she represents are aware of the sex and violence but also like the high ratings the network shows are receiving. Obviously the network must make some tough decisions based on this affiliate feedback. Should it cancel the shows with sex and violence, irritating the affiliates from the big cities, or should it keep the programs on the air and risk losing affiliate support in some conservative markets? Whatever decision the network makes, even in our hypothetical examples, they will want to know what the affiliates are thinking and how they will react to any changes in network programming.

Criticisms of the Network Concept

Any time an organization becomes a powerful conglomerate, it attracts its share of criticism. Networks are no exception. Some of the criticism has been directed at the very concept of hugeness and the control it fosters. More than a decade ago, Vice President Spiro Agnew lashed out at network control in a famous speech to a Republican political gathering, claiming Eastern (liberal) bias in network news coverage. His speech caused a stir among journalists and gave the public a target for widespread criticism.

More recent criticism of network news came when CBS paid Watergate offender H. R. Haldeman for an exclusive interview. The incident launched a wave of discussion about "checkbook journalism," but CBS survived relatively unscathed. Similar criticism came when a one-time cooperative venture between the CIA and CBS became public knowledge. Criticism has also been satirized, in the movie *Network* starring Faye Dunaway. The movie went to the ludicrous point of depicting an anchorperson murdered on the air just to gain top billing in the ratings. The movie was a farce, but not everyone saw it that way. More than one theater owner reported people leaving the lobby shaking their heads about how terrible it actually was inside the network decision rooms.

Let us turn our attention away from criticism now as we take a closer look at major network operations. We shall examine the commercial networks, leaving public broadcasting for the next chapter. In chapter 3, on the development of modern radio and television, we discussed the formation of the early networks. The youngest major commercial network is ABC, formed when NBC was forced to dispose of its dual-network operation.

When ABC acquired its own identity in 1943, it began a concentrated effort to compete with its two closest rivals, CBS and NBC. Because of some advantageous breaks, the late 1940s was a profitable time for ABC radio. One of its biggest breaks was singing star Bing Crosby. When Crosby wanted to produce a prerecorded show instead of meeting the demands of the weekly radio appearances, ABC gave the innovative idea a try. It proved that even a prerecorded show could be a hit, and other stars followed Crosby's example. No longer plagued by the image of an unsteady toddler, ABC moved forward into television.

Gaining Corporate Maturity: Television and Mergers

In a special program originating from Broadway's famous Palace Theater, ABC launched its television ventures on Tuesday, August 10, 1948. ABC's flagship station, Channel 7, with the call letters WJZ-TV, showed a documentary on the progress of New York City, narrated by Milton Cross. Cameras caught the live action of a parade outside the Palace, street dancing, music from Times Square, an eighty-piece combined police and fire department band, majorettes, and horse-drawn fire engines and streetcars. Later that evening, viewers "watched" "Candid Microphone" with Allen Funt, a radio version of the future "Candid Camera." Shows in the coming weeks included "The Fitzgeralds," "Hollywood Screen Test," "Ethel and Albert," "You're Invited," "The Singing Lady," and "Quizzing the News."

A month later, ABC regional network programming began in the Midwest with hookups between stations in Chicago, Milwaukee, Cleveland, and Toledo. The Chicago Cardinals and Pittsburgh Steelers football teams launched the regional network.

Not all of ABC's corporate maturity came from television. Needing capital to make inroads against their competition, ABC announced plans for a merger with United Paramount Theaters, Inc. (UPT) in 1951. That same year, both the ABC and UPT boards of directors approved the merger, and the FCC held hearings on it in 1952. By early 1953, the merger was complete, and cash reserves of $30 million were added to ABC's bank account. In a shrewd personnel move, Robert T. Weitman, a vice president at UPT, was placed in charge of ABC talent. Weitman had previously been instrumental in advancing the careers of Frank Sinatra, Danny Kaye, Red Skelton, Betty Hutton, and Perry Como.

The mid-1950s signaled changes in both station operations and corporate structure at ABC. New call letters were assigned to the network's

O ~~& O New York station, and WJZ became WABC.~~ Within the company, five new divisions were formed: the ABC Radio Network, the ABC Television Network, ABC Owned Radio Stations, ABC Owned Television Stations, and ABC Film Syndication. By the end of the decade, ABC had become a formidable opponent.

Edging the Competition

Unfortunately, the "formidable opponent" status was where ABC television remained. Although profitable and popular, moving out from under the dominance of NBC and CBS was no easy task. It ~~took the~~ combination of a greater number of television ~~stations on~~ the air and popular programming ~~to bring ABC out of the~~ cellar.

The magic formula started to work in the mid-1970s. The network had already managed to excel in one important area, sports programming, ~~with its popular "ABC Wide~~ World of Sports." From Johnny Carson's puns on NBC's "Tonight Show" to major national programming awards, "Wide World of Sports" was clearly a favorite. Then, when weekends seemed saturated with football, ABC introduced "Monday Night Football." With stars Howard Cosell, Frank Gifford, and Don Meredith, the show became the "in" pastime for people and parties huddled in front of the television set. Excellent Olympic coverage added more gold to ABC's pot.

But sports could not manage everything. Entertainment had to put in its share. ABC launched a talent raid that plucked comedian Redd Foxx and "Today" host Barbara Walters from NBC and programming executive Fred Silverman from CBS. Walters gained publicity for her reported one-million-dollar salary, ~~and Silverman for making~~ ABC stock jump upward the day he ~~announced his resignation~~ from CBS. Perhaps ABC's biggest push into dominant prime-time television occurred with its presentation of *Roots*. First aired in January, 1977, the story of black struggle traced through the "roots" of author Alex Haley's family set new records in television viewing. The twelve-hour production included stars such as John Amos, Madge Sinclair (Figure 7–1), LeVar Burton, Lorne Greene, Ed Asner, Cicely Tyson, and others. A second showing of the same series again brought ABC the lead over its competitors, and the second series titled *Roots: The Next Generations* topped another week of prime-time for ABC in early 1979.

Meanwhile, Fred Silverman (Figure 7–2) had exited ABC in 1978 for a new job at NBC. And while he was still attempting to get NBC out of the ratings cellar, ABC continued to introduce new shows in its situation-comedy genre, one of the most popular becoming *Mork and Mindy*, the story of a Martian who lives with his girlfriend in Boulder, Colorado.

Figure 7–1 ABC's "Roots" achieved a rating success for the network and at the same time strengthened its position in prime-time competition with NBC and CBS. A host of stars appeared in the program, including Madge Sinclair and John Amos (pictured). The first series ran in the fall of 1977 and was repeated in 1978. "Roots, The Next Generations," first appeared in February, 1979. (Courtesy ABC, Wolper Productions, Inc.; Warner Bros.; Phil Gersh Agency; Bresler, Wolff, Cota and Livingston)

CBS

CBS had both the resources and personnel to be a formidable opponent of ABC. By the late 1940s William Paley had already established a track record as an excellent administrator and builder. He was joined at CBS by an exceptional management team.

Klauber, Kesten, and Stanton

Speculating on how CBS might have developed with different executives is difficult, but for its record of corporate growth, the report card of Paley and his management team shows high marks. With net sales of $1.3 million in 1928, the network, exclusive of allied businesses, had an

Figure 7–2 After bringing ABC to the top of the ratings, Fred Silverman left the network in 1978 to become NBC's president and chief executive officer. (Courtesy NBC)

annual revenue of $1 billion by the late 1970s, making it the largest single advertising medium in the world.

In addition to Paley, three people greatly contributed to CBS's early growth—Ed Klauber, Paul Kesten, and Frank Stanton. Klauber was a newspaper reporter by profession until Bill Paley coaxed him off the night city-editor's desk of *The New York Times* in 1930. Klauber, hired as Paley's assistant, is credited with shaping the character of early journalism at CBS. Paul Kesten came from advertising. Recruited as head of sales promotion in 1930, Kesten earned his stripes with the New York ad agency of Lennen & Mitchell. One of his first decisions was to hire the accounting firm of Price, Waterhouse to conduct an "audit" of NBC's claim to having the highest radio listenership. In the audit, CBS came out on top.

Dr. Frank Stanton joined CBS five years later in 1935. A psychology professor at Ohio State University, Stanton had an interest in measuring radio listenership. When CBS learned of his work, it brought him to New York at a $55 weekly salary and gave him the number-three position in a three-person research department. Frank Stanton continued to measure radio listenership and developed an electronic device to measure immediate responses to radio programs. He later left the research department and by 1942 was an administrative vice president. As much a statesman for the entire broadcasting industry as a CBS executive, Stanton rose to the top of CBS in 1946 giving the company what many said was a sense of character and responsibility.

Trial and Error in Corporate Expansion

CBS did not remain strictly in the broadcasting business. As with ABC, CBS began to apply its profits to acquisitions which in some ways directly supported, yet were different from network operations. As we learned earlier, a lucrative artist-management business gave the network ready access to top talent. However, the FCC questioned the propriety of the network's control of talent, so CBS sold its interests to the Music Corporation of America. Similar to those discovered by the other networks, the more profitable acquisitions turned out to be radio and television stations in large markets, not only giving the network an affiliate station, but also a share of the affiliate's profit.

CBS ventured into sports, publishing, and the recording industry. The sports venture was not successful. After CBS bought the New York Yankees in 1964, the team promptly sank into the doldrums. Attendance dropped, and CBS sold the baseball team in 1973.

In 1951, Frank Stanton asked CBS's creative director of advertising and sales promotion, William Golden, to design a corporate trademark for all these business ventures. Golden came up with the famous CBS "eye." Early depictions had it superimposed on a clouded sky to lessen the fuzzy edges of the sharp lines which showed up poorly on some of the early black and white receiving sets. Although dropping the background, the eye today remains one of the few corporate trademarks that has not undergone radical change over the years and is consequently one of the most recognized corporate logos in the world.

Programming

Until ABC began inching its way up the programming ratings ladder in the 1970s, CBS for many years dominated television programming. Some of the early favorites were "I Remember Mama," an evening family drama about an immigrant family with three growing children. "I Love Lucy" belonged to CBS and set the stage for a generation of situation comedies. The network opened CBS Television City in Hollywood which produced such shows as "Playhouse 90." Children's programming made a hit with the long-running "Captain Kangaroo." Such adult variety programs as the "Ed Sullivan Show" continuously capped the ratings. CBS News also had its share of successes with Edward R. Murrow (Figure 7–3) and "See it Now" becoming a classic in broadcast journalism. "Douglas Edwards and the News" (Figure 7–4) and exclusive interviews with such notables as President John Kennedy and Soviet leader Nikita Khrushchev kept CBS news on top and anchorperson Walter Cronkite topped polls as the United States's most credible person.

Figure 7–3 Edward R. Murrow. (WNET/13 & CBS Inc.)

Figure 7–4 Douglas Edwards.

NBC

The ~~oldest of the three commercial networks is NBC. With its Red~~ and Blue ~~dual-network~~ concept, it gained momentum ~~early and was well entrenched when CBS arrived~~ on the scene.

Sarnoff and Goodman

If we look at NBC's past and present, two people stand out as sharing the largest responsibilities—David Sarnoff (Figure 7–5) and Julian Goodman. For Sarnoff, the impetus came from RCA, NBC's parent company.

Figure 7–5 David Sarnoff, seen here holding magnetic tape which RCA demonstrated in 1953, ushering in the era of "electronic photography" for television. (RCA)

The shore-bound radio operator during the *Titanic* disaster, Sarnoff came to RCA from the American Marconi Company. His energies at RCA were directed to two areas—developing new broadcast technology and promoting television stars as a means of winning audiences. In technology, he encouraged the development of FM and committed millions of dollars to Zworykin to continue his experiments on an electronic television camera. With Sarnoff as its leader, RCA pioneered in color television, devloping the system finally approved by the FCC for full-scale color production (Figure 7–6).

Julian Goodman is a product of NBC more than of RCA. His lifetime career started with the network in 1945. Goodman was to NBC what Ed Klauber was to CBS. His stints for NBC News were as an editor in Washington and as head of news and special events for the NBC radio network. He attracted the attention of top NBC echelons after holding key news directorships during both the 1952 and 1956 national political conventions. Both years were during television's golden age when its merging dominance was watched closely by the public and industry alike. By the end of the 1950s, Goodman was head of news and public affairs. Six years later in 1966, he held the NBC presidency. Subsequent positions moved him to the chairman of the board of NBC.

Figure 7–6 The first commercial RCA color television receivers came off the production line on March 25, 1954, at the company's plant in Bloomington, Indiana. (RCA)

Strategy, Stars, Color, and Innovation

During Goodman's tenure, the network continued to grow, based on a three-pronged attack that Sarnoff had started and perpetuated: ~~stars,~~ color, ~~and innovation.~~

Radio had been a medium of programs, but Sarnoff realized that television made people bigger than life. So people would be in what NBC invested its efforts. Major moves were made to attract and sign top talent. Names ~~like Milton Berle (Figure 7–7) and the "Texaco Star~~ Theater" gave America ~~a new night at home with the television set~~. Sid Ceasar with "Your Show of Shows" and Eddie Cantor's "Comedy Hour" all contributed to the "people" orientation.

Two ~~other~~ factors helped even more—color television ~~and~~ innovative programming. With ~~the FCC's approval of~~ RCA's color system, it was only natural ~~that NBC~~ moved ahead ~~full-speed to~~ air as many color programs ~~as possible.~~ Regardless of whether you were watching in color or in black and white, the famous NBC peacock spreading its tail feathers spelled credibility. The ~~first network colorcast~~ was the 1954 Tournament of ~~Roses Parade~~. Ten years later, NBC was producing almost all of its programs in color.

NBC initiated a series of firsts in programming, many later copied by other networks. With host Dave Garroway, the "Today Show" dawned in

Figure 7–7 Milton Berle.

1952 followed two years later by the "Tonight Show" with host Jack Parr, then Steve Allen, and finally Johnny Carson. By the 1970s, insomniacs were watching the postmidnight "Tomorrow" program. Westerns were also NBC's glory. The Ponderosa swept the imagination of millions with "Bonanza" (Figure 7–8). Then came the NBC "specials" like "Satin and Spurs" with Betty Hutton and "Peter Pan" with Mary Martin. In movies, the network pioneered with "Saturday Night at the Movies" and later "World Premiere Movies." News and public affairs programming included in-depth coverage of the political conventions, and NBC capitalized on the popularity of two anchormen named Chet Huntley and David Brinkley.

Today, with the network race even more hotly contested than in past years, NBC has worked hard to match CBS in news and ABC in sports. By acquiring programming whiz Fred Silverman from ABC and signing the rights to air the 1980 Winter Olympics, NBC has placed itself in a position again to rise to the top slot in prime-time ratings.

Figure 7–8 "Bonanza" became one of the longest running Westerns on television. Dan Blocker (left) has since died, Michael Landon (center) went on to produce and star in "Little House on the Prairie," and Lorne Greene appeared in the fall-1978 series, "Battlestar Galactica."

networks and allied businesses

Although broadcasting contributes a major share of the networks' income, it is interrelated with a wide range of other businesses, including publishing, recordings, amusement parks, and electronic supplies. For example, ABC not only owns the network as well as the ABC owned and operated radio and television stations, but it also owns ABC Theaters. Located in eleven southern states, the theater division constructs multiscreen theaters in new urban areas. With this large chain of movie houses, the network is able to negotiate profitable rental rates for first-run movies for its theaters. Publications such as *Prairie Farmer*, *Wisconsin Agriculturist*, and *Modern Photography* are owned by ABC as is the tourist attraction, Historic Towne of Smithville, located near Atlantic City, New Jersey.

At CBS, the organization chart (Figure 7–9) shows a Broadcast Group, Records Group, Columbia Group, and Publishing Group. We have already learned about the Broadcast Group which consists of the network, the owned-and-operated stations, and CBS News. The CBS Records Group is the world's largest producer, manufacturer, and marketer of recorded music. Bob Dylan, Chicago, Barbra Streisand, and Lou Rawls are just some of the stars recording on CBS labels. Record and tape clubs, retail stores, Steinway pianos, and Creative Playthings toys are part of a company division called the Columbia Group. The publishing house of Holt, Rinehart & Winston and the proprietary schools of Brown Institute and the Kansas City Business College in Missouri are part of the CBS Publishing Group.

For NBC, the umbrella of allied corporate interests is RCA. Electronic parts and equipment continue as big businesses. Brand names such as the XL-100 TV line are part of RCA's division of Electronics-Consumer Products and Services. Commercial electronic products are manufactured and sold as part of RCA's Electronics-Commercial Products and Services. If you buy a Banquet brand frozen dinner, rent a Hertz Rent-A-Car, read a book published by Random House, or talk to Alaska through the Globcom satellite networks, you are contributing to RCA's income.

contemporary radio networks

When television reached its golden age, some predicted the demise of radio, especially the radio networks. This simply has not happened. Although they do not provide the same amount of programming they once did, radio networks are still a vital part of radio broadcasting. In fact, with the soaring costs of television advertising, radio networks have been increasingly attractive to advertisers.

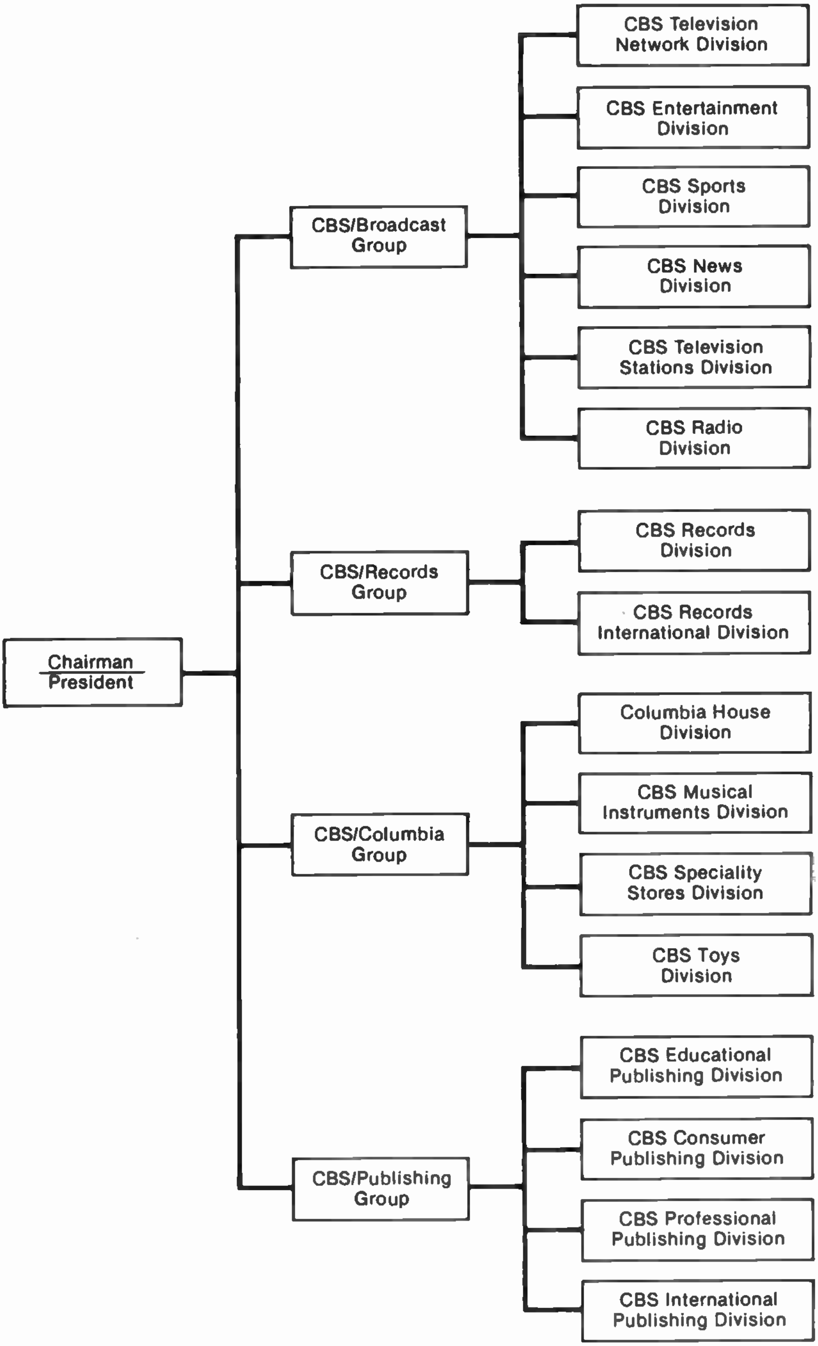

Figure 7–9 CBS's allied businesses range from television, to recordings, to retail sales, to publishing.

ABC's Demographic Networks

One of the more innovative ideas in modern radio was the decision by ABC in 1968 to break off into four separate radio networks. The split created the American Information, American Contemporary, American Entertainment, and American FM Radio Networks. The four networks are designed to serve affiliates reaching audiences with different demographic characteristics. For example, stations programming rock music and reaching a younger audience might affiliate with the American Contemporary Network which has short, fast-paced newcasts. A station with news and information programming might affiliate with the ABC Information Network. These same demographics are equally attractive to advertisers wishing to reach those audiences.

The content of the news on the different networks also varies. Designed for younger audiences, the Contemporary Network has less emphasis on foreign news and more on consumer-oriented, "pocketbook" stories. The Information Network emphasizes foreign and domestic politics and political aspects of the economy. Many affiliates with the American FM Network program progressive rock music, reaching a young, college-age audience. Thus, stories on the FM Network emphasize such things as careers, young politicians, and information of interest to an audience ABC characterizes as "thoughtful and involved." American Entertainment Radio News serves affiliates that offer easy listening, middle-of-the-road music, reaching an older audience. Along with regularly scheduled newscasts, the Entertainment Network features "Paul Harvey News."

Using the same feed lines, each of the networks broadcasts its separate newscast at different times during the hour. Thus, ABC gains maximum efficiency and minimum line charges per network. On the hour, Information Radio programs five minutes of news. FM then airs news from 15 to 19 minutes after the hour. Entertainment takes over at the half-hour for five minutes, and Contemporary Radio comes on with a minute-long "News in Brief" at 50 minutes and 30 seconds after the hour, and a 4 1/2-minute newscast at 54 minutes and 30 seconds after the hour. What started out with 400 affiliates in 1968 when the four networks began has grown today to over 1,500 affiliates.

Mutual, NBC, CBS

Of the major networks, only the Mutual Broadcasting System, MBS, remains exclusively radio. Its identity has been shaped by regularly scheduled newscasts, including such familiar names as Fulton Lewis, Jr. and his son Fulton Lewis, III, airing regular commentaries on the network. Mutual affiliates also receive such major sports events as Notre

Dame football, championship boxing, NFL football, PGA Golf, and the Sugar Bowl. Colorful commentaries are heard from regulars Jack Anderson and oddsmaker Jimmy the Greek.

In 1975, trying to capture some of the still unclaimed affiliates market, NBC launched its News and Information Service (NIS) which fed approximately forty-five minutes of news per hour to all-news affiliate stations. The idea was good. All-news stations, although reaching mainly an educated, affluent audience, incur major expenses. Costs for broadcast journalists can be high, especially in smaller markets. To affiliates, NIS was costly but less expensive than hiring local personnel to cover national news. Unfortunately, the number of affiliates needed to make NIS profitable did not materialize, and in 1977, NBC dropped the service. Some NIS affiliates scrambled to develop an alternative network, others switched to wire-service audio or other networks, and still others went back to programming music. For some affiliates, the dissolution of NIS was costly. Major promotional campaigns had publicized their all-news operations, and they suddenly either had to change formats and consider their promotional campaigns as lost revenue, or make major expenditures to hire local reporters to cover a full news schedule. Today, the NBC Radio Network still serves affiliates nationwide, but NIS is a part of history.

CBS, perhaps watching the NBC experience, has yet to specialize its radio operations. CBS radio affiliates still receive a regular schedule of network newscasts, many of which are anchored by nationally recognized newscasters from CBS television.

UPI Audio and AP Radio

Although not networks in the traditional sense, many radio stations affiliate with wire-service audio. Local stations pay a fee to subscribe to the wire-service audio. The stations then can sell time within the audio newscasts to local advertisers, which many station managers feel is a more profitable arrangement.

United Press International first launched an audio service in 1956 with state news telephone feeds in North Carolina and California. By 1960, the wire service established a New York audio headquarters and three years later added a Washington, D.C. audio bureau. The next year an audio bureau in London was opened, and by 1965, coast-to-coast hookups were operable. The 1970s brought hourly newscasts, expanded sports coverage, and experimental satellite transmission. In 1977, UPI initiated a regional audio service which operates out of its Chicago and Los Angeles bureaus. In addition, UPI Audio feeds affiliates a daily set of audio actualities which stations can incorporate into locally produced newscasts.

Associated Press began an audio service in 1974 called AP Radio. Based on the same principle as UPI Audio's national news service, affiliates pay a fee to receive the service, then sell local advertising time within the regularly scheduled newscasts.

Wire Service and Audio Advisory Boards

Along with the networks, the wire services also use affiliate advisory boards. These can operate at either the state or national level. Typical of such organizations is the UPI Broadcast Advisory Board. The history of the organization can be traced to 1976 when it was conceived at a steering committee meeting of UPI executives and broadcasters.

The committee formulated plans for the UPI Broadcast Advisory Board and constructed a set of initial objectives.

1. Evaluation and improvement of UPI Services.
2. Better understanding of UPI technology by subscribers and public.
3. Improvement of general image of broadcast news.
4. Encourage input, discussion, and recommendations at all levels.
5. Forum for discussion of major complaints affecting the general performance of the service.

These objectives were later used in writing the board's bylaws.

The UPI Broadcast Advisory Board met for the first time in December 1976 in Chicago. To assure representative membership and orderly replacement of board members, the bylaws provide for a board "generally representative of geographical areas, large and small radio and television markets, independent and group ownership, management and working news people." Membership on the board consists of "a minimum of 13 and a maximum of 16 members, and the Board is empowered to expand its membership to include international members." The bylaws also provide for the election of officers, terms, and special committees. Evidence of the rapidly changing developments in broadcast journalism comes under the heading of "technology," which charges the board with encouraging "research and development of new methods and systems in broadcast news."[2]

ethnic, educational, cable, and religious networks

Whereas ABC divides its listeners into such demographic categories as age, education, and income, two other networks have been successful in directing programming to audiences based on race and national origin. In radio, the National Black Network formed in 1973 serves more than

80 affiliates covering 90 black markets and reaching approximately 70 percent of the United States' black population. With headquarters in New York, news on the network emphasizes events and issues of importance to black Americans. Owned and operated by blacks, the network currently produces 120 hourly newscasts each week. Other programs heard on the network include the 30-minute news forum, "Black Issues and the Black Press," patterned after NBC's "Meet the Press." Commentators and entertainment programming supplement the regular newscasts.

What the National Black Network offers to the black audience, the Spanish International Network (SIN) provides for the Hispanic-American audience. Formed in 1961 to reach Spanish-speaking households, SIN is a television network which airs Spanish-language programming and programming pertinent to Hispanic-American culture. Affiliated with television stations reaching a large percentage of Hispanic-Americans, there are SIN affiliates in Chicago, New York, Miami, and similar markets stretching from Texas across the Southwest and up the California coast to San Francisco.

Although we shall learn later in this text about public broadcasting networks, we should be aware that many noncommercial radio and television stations not only provide instructional programs for in-school use, but also are a transmitter and source of programming for many state and regional networks. Often these networks are part of a state system of higher education. One of the pioneers is the Alabama ETV network. In Indiana, the Indiana Higher Education Telecommunication System (IHETS) links both state and private colleges and has two-way television capabilities. In this way, a professor can lecture from one campus to students on another. The students immediately can ask questions of the professor through a two-way talk-back system. The talk-back system is another example of the changing definition of mass communication which we discussed in chapter 1—delayed feedback being replaced by immediate feedback.

Cable television's growth has spurred interest in networks linking cable systems. With satellite interconnection systems, the technology is already operable to offer satellite-distributed programs to cable systems. Other cable networks operate more as an exchange, sharing programs or joining to purchase such special programming as sports events or first-run movies.

Multipoint distribution service—using microwave to distribute television signals over a small regional area—has enabled such organizations as schools and churches to enter the world of network television. One example of this is operating at the Catholic Television Network of Chicago (CTNC). With its own television studios and distribution system, the network broadcasts educational television programs to Chicago's Catholic Schools.

syndication: the network alternative

Syndication is the distribution of a self-contained program directly from a production house to the station, bypassing the networks. The station schedules the program at its convenience, paying a fee for the program or bartering it through trade-out arrangements, such as agreeing to air advertising already contained in the program. Shows like "Lawrence Welk," "The Mary Tyler Moore Show," and "Hee Haw" all are syndicated.

Breaking the Ice: "Mary Hartman, Mary Hartman"

In order to go into syndication, most programs first started as network material, proved they could attract a loyal following, then made the break with the network and wooed the individual stations. The first program to go directly into syndication on a mass national scale and achieve popularity was Norman Lear's somewhat controversial "Mary Hartman, Mary Hartman" (Figure 7–10).

Having been turned down by the television networks, Lear resorted to direct syndication for the show, and its popularity took off, drawing

Figure 7–10 Louise Lasser starred in "Mary Hartman Mary Hartman," one of the first series to go directly into national syndication and be successful. (T.A.T. Communications Company)

large audiences. Some bold, metropolitan stations even backed the program up against their competitors' late-evening news programs, scoring rating points that gave news consultants a headache.

But "Mary Hartman, Mary Hartman" started a chain of events that may do more than merely attract television viewers. Local affiliates have become increasingly dissatisfied with the type of programming coming out of network hoppers. With "Mary Hartman, Mary Hartman," station managers are realizing that there may be other alternatives to the network distribution system. What is popular in one city may not be in another, and syndication gives managers a freedom of choice that network television does not.

Advantage of Network Exposure

"Mary Hartman, Mary Hartman" was an example of direct syndication. But airing a show on the network and then placing it in syndication is still the preferred route. When the network takes the program and promotes it in a major prime-time lineup, it reaps the benefit of a coordinated, national promotional effort that few syndicators could afford to match. Plugs in prime time, newspaper advertising, and other publicity give the program the best possible chance of success. Remember, the network wants the show to succeed just as much as the company that produces it does.

With direct syndication, individual stations are responsible for promoting the program within their own schedules. That may mean a huge advertising campaign or hardly a mention. Although promotional literature and photographs are made available to the subscribing stations, the station is under no obligation to use the material. Besides, local news often is favored in the allocation of the local advertising budget.

If a program does become a network hit, then syndication is almost assured. The profits to be made in syndication will probably far exceed the money earned from the network. In fact, some production companies sell a program to the network at a loss, hoping to regain the loss when the program reaches syndication.

Although a big gamble, the money syndication can bring makes it worth the risk. The money can continue to trickle in for years to come. The cartoon program "The Flintstones" was aired on network television almost twenty years ago. It is still in syndication today with its lifetime earnings climbing over $30 million in 1980. A program of equal success currently on the network will bring many times that much syndicated revenue, based on current syndicated rates, which can easily bring in tens of thousands of dollars for a single half-hour program in a major market like New York or Los Angeles.

Despite the publicity a network can give a program, direct syndication's popularity is growing. We have already learned that direct syndication's customer list ~~is expanding due to~~ the dissatisfaction of some station managers and ~~viewers~~ with network programs. The success of syndicated programs has lured more syndicators into the marketplace, increasing the programming variety and keeping costs competitive.

Direct syndication ~~eliminates the need to "fit" the network~~ audience. For example, if you own a production company that produces a weekly series on skiing techniques, the network probably will not be interested. Although its affiliates in New England and the Northwest would consider the show, stations in the deep South would very likely preempt the program with something more popular in their local areas. Yet by going into direct syndication, you can create your own network of stations. In fact, you might find enough stations in New England and the Northwest interested in airing your series to make your venture profitable.

The same principle applies to the expanding enterprise of regional syndication. Perhaps your area hosts a salt-water fishing tournament. A documentary of the tournament would be of interest to other stations located near the ocean. Conversely, generating wide acceptance for the show in Nebraska and Iowa would be difficult.

Major events are becoming attractive to syndicators. Tying up rights to special productions can make a long-term syndication package very lucrative. For example, although the Miss America Pageant is a network production seen internationally, you may be surprised to learn there is also a Miss Rodeo America Pageant. Held in the Southwest in conjunction with the National Finals Rodeo, contestants from the 50 states and Canada compete for the title of Miss Rodeo America. Although the networks shied away from the pageant, syndicators saw major audience appeal, especially with pretty girls, colorful Western outfits, and such hard-fought competition as barrel racing and showing horses. These all spell color, action, and entertainment—three appealing ingredients to a television syndicator. Public broadcasting saw the potential first and gave the pageant regional television syndication. The event is just one more example of the growing variety and potential of direct syndication.

Many syndicated programs find their way out of the broadcasting station and into an educational institution, corporation, library, or church. A syndicated religious documentary that first airs on television can find additional audiences at a Sunday morning Bible class or at a convention of lay preachers. As you can see, the market possibilities for syndicated material are turning it into a booming business.

syndicating radio

So far we have been talking about television syndication. Syndication also is alive and well in radio, ~~especially since the networks take up so lit~~tle of the ~~staion's programming schedule. With the~~ increased number of aut~~omated staions, syndication has found a ready m~~arket. With automation, the local station still programs commercials and local newscasts, but much of its remaining programming comes from syndication. It can choose from a wide variety of syndicated radio programming, anything from music to interviews and talk programs. In addition, both nonautomated and automated stations use syndicated production aids called "jingles" to insert between records, introduce newscasts and weather reports, and adopt as a musical background for commercial and public service messages.

Why Syndicate?

Syndication is an economical way to operate a station while at the same time providing a "competitive sound." But before deciding to use syndicated programming, you first should evaluate the competition. Is there a programming need not being met or an audience not being reached by the competing stations? Second, you must decide that when your station does air locally produced programming, it will be of the highest quality. Commercials, local newscasts, weather reports, and supplemental, local disc jockey entertainment must be able to blend professionally with the syndicated music. Poor quality in local production is only accentuated by high quality syndicated programming.

Formats

A wide variety of syndicated formats are available, but not every syndicator defines the same format in the same way. Thus, managers must preview the syndicated "sounds" to make sure they fit the need of their market. Most syndicators offer a limited number of formats, keeping to a reasonable minimum the size and range of their own musical libraries. Syndicators specializing in contemporary music might syndicate progressive-rock, country-rock, and soft-rock formats. Each of the formats tends to overlap, and hit songs which are on more than one chart, such as *Billboard*, can be inserted in more than one syndicated format.

Other syndicated packages can be even more specialized, offering "middle-of-the-road string orchestras" or "up-beat string orchestras." Still another may contain "middle-of-the-road orchestras and bands." To offer these specialties, the syndicator purchases mostly albums and interchanges the different cuts on the albums to fit the different formats.

Talk radio is another specialized format in which a talk-show host interviews listeners who call in to the station. The original program can be taped in one market and aired in another. The host is careful not to make any reference to the city in which the show originates, and the topics do not have a highly localized emphasis. If the show does become localized, that part can be deleted before the program is syndicated.

The Consultant as Syndicator

In television syndication, the syndicator has little involvement with the station except to sell the program. In radio, however, the association is much closer. Radio formats are a more "finely tuned" type of programming than television formats. First, they last longer, in some cases for the entire 24-hour broadcast schedule. Second, the competition may be much greater. Instead of a market of three or four television stations, it may have twenty or more radio stations. Third, the local radio station directly participates in the programming because of its locally produced and inserted commercials and newscasts.

As a result, the radio syndicator often doubles as a broadcast consultant, recommending how the programs should be utilized. Judging whether the local commercial production is up to par or if the musical background of the commercials matches the syndicated format becomes the consultant's major concern. If the station is going to continue to use syndication, it must see an increase in audience and, ultimately, in profits. Moreover, the reputation of the syndicator is at stake. A station at the bottom of the ratings is not good publicity for the syndicator. But one which is on top can be a valuable asset in selling other stations. Thus, along with buying the syndicated programming, management's willingness to work closely with the consultant can determine the difference between success or failure.

Anthologies and Concerts

Along with regular radio programming, syndicators have found profits and popularity in special anthologies of music. With heavy promotional efforts, the anthologies are programmed as a continuing special over whatever schedule fits the station. Some of the most successful include "The History of Rock and Roll," "The Golden Year of Rock," "Top 100 of the 60s," and "The Golden Years of Country."

Rock concerts are another popular syndication feature, and "The King Biscuit Flower Hour" has one of the biggest followings. The unusual name, drawn from old-time radio, is the brain child of two former network executives, Bob Meyrowitz of NBC and Peter Kauff of ABC. The "Hour," which sometimes runs 90 minutes, is a recording of an actual rock concert. The recording is then syndicated by D.I.R. Broadcasting Corporation. Meyrowitz and Kauff are the president and executive vice president, respectively, of D.I.R. Recording very popular rock groups, the "Hour" is syndicated to more than 200 radio stations and has become a Sunday night ritual for more than 6 million listeners. In many markets, it effectively competes with prime-time television.

Spinoffs of "The King Biscuit Flower Hour" have also been successful for D.I.R. Repeating some of their best concerts, a show aptly entitled "The Best of Biscuit" airs the first Sunday of each month. D.I.R.'s show "Conversation" contains interviews with rock stars interspersed with their music. "Conversation" is hosted by Dave Herman, a radio personality from WNEW-FM in New York. Other D.I.R. programs have aired in England under the title of "The British Biscuit."

format control in syndicated programming

With the increase in both the number of automated stations and the reliance on syndicated musical programming, the issue of format control also has become important to the field of syndicated programming. Keep in mind that the FCC still feels the licensee should be responsible for its format ~~in order to serve the public interest~~. As a result of some rather binding contracts offered to broadcasters by syndication companies, the FCC has adopted guidelines for broadcasters to follow when agreeing to carry syndicated programming. The commission suggests stations should not enter into contracts which:

1. Fix the number of broadcast hours;
2. Prohibit AM-FM duplication;
3. Prohibit sub-carrier authorizations;
4. Require the exclusive use of any music format service, or prohibits other sources;
5. Fix the amount of format service company music broadcast; [*sic*]
6. Prohibit any announcement by the station;
7. Fix the number of commercials broadcast;
8. Limit the content or source of any nonmusical programming;
9. Fix the amount of air time for news, music, or other programming;
10. Prohibit automatic gain control of company-supplied material; or
11. Allow termination in the event of program format changes by a licensee exercising his responsibility for the public interest.[3]

The key to the contracts is to retain flexibility. This is especially important in long-term contracts. The FCC ~~does~~ not want the licensee obligated to the degree that programming "in the public ~~interest~~" might not air because ~~of restrictions placed upon the station~~ by the syndicator.

Syndication contracts have also been scrutinized because of recent changes in rules affecting simulcasting. Before 1977, an FM station owned with an AM station could not duplicate the programming of the AM station more than 50 percent of the time in markets having a population of over 100,000. In 1977, the rule was changed to 25 percent duplication in markets of over 100,000, and in 1979, the 25 percent duplication rule becomes effective for stations in markets over 25,000. Additional syndicated programming thus is often used to meet these nonduplication requirements.

the fourth network concept

The success of syndication has provoked discussion of the possibilities of a fourth network. Part of the discussion is on semantics. What exactly is a fourth network? A major network of the size and scope of one of the commercial networks or the public broadcasting system is not yet foreseen. But an alternative network with quality programming, although with fewer stations and fewer broadcasting hours, is conceivable.

Four reasons give this new network its potential. First, with the revenue that syndication is generating, industry planners are beginning to feel that a network would have a chance of financial success. Profits of independent stations, those most likely to carry the new network, are up, and they can thus afford to pay higher prices for quality programming. Second, even network affiliates are receptive to the idea, especially those who are unhappy with the programming of the three commercial networks. Third, the technology is ready. With satellite systems capable of transmitting programs to cable companies with earth stations, a "wired" fourth network is already functional in some areas. A fourth reason is the current advertising rates on the three commercial networks. Rates, although still economical considering the audience reached, have reached a level at which only large companies can afford major advertising campaigns. Thus, dollars are being channeled into such other media as direct mail and magazines, dollars which theoretically could be used for advertising on a fourth network.

A fourth network could be successful if advertisers were willing to make a commitment beyond the "experimental" stage. If there were a commitment the network would need quality programming which can compete with that of the commercial networks. It would require stations willing to air programs simultaneously in order that national ratings could be made for specific day-parts and programs. If these prerequisites were met, then the fourth network concept could become a reality.

summary

Chapter 7 discussed networks and syndication, mostly the commercial networks with public broadcasting to be discussed in another chapter. Networks give advertisers a means of reaching a mass national audience at economical rates. Their entertainment programs are usually bought from production companies, but their news and public affairs programming is self-produced. At the heart of the networks are the affiliate stations which, with the public, have strongly criticized network operation.

The three major commercial networks, ABC, CBS, and NBC, remain viable and profitable. ABC, formed when NBC sold its Blue Network, quickly acquired an identity and became a formidable competitor of NBC and CBS. CBS gained an early reputation as a leader in broadcast journalism under Ed Klauber and in sound management under William Paley and Dr. Frank Stanton. With little more than a million dollars in revenue in 1928, the network had its first billion-dollar year in 1976. NBC, meanwhile, developed under the RCA umbrella and the guidance of David Sarnoff. Using big-name stars, color, and innovative programming to make its mark, NBC continues to make profits. Although the networks themselves are big business, all are interconnected with other business ventures. These include such wide-ranging enterprises as publishing, amusement parks, rent-a-cars, and frozen foods.

All three of the major commercial networks are in radio, as is the Mutual Broadcasting System. ABC, in attempting to satisfy the specialized audience of radio, split into four demographic networks in 1968. Both UPI Audio and AP Radio provide alternatives for radio stations not affiliated with the commercial networks or for those which want to supplement their network programming. Other examples of radio and television networks include ethnic, educational, cable, and religious networks.

A growing alternative to network programming is syndication, which received a positive push from the success of "Mary Hartman, Mary Hartman." Radio syndication is also booming, as is the number of automated broadcast consultants. With the high cost of advertising on the big three commercial networks, the concept of a fourth network could very well become a reality.

spotlight on further learning

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8

educational and public broadcasting

FOCUS After completing this chapter we should be able to

Trace the beginnings of educational and public broadcasting.

List some of the earliest uses of educational television.

Tell how the MPATI experiments affected the development of educational television.

Explain how educational broadcasting fits into the learning experience.

Discuss the transition from educational to public broadcasting.

Explain the functions of PBS and NPR.

Describe how the Station Program Cooperative operates.

Understand the scope of programming on public stations.

List questions posed to the second Carnegie Commission studying public broadcasting.

At 6:55 A.M., radio and television stations are keying up for another broadcasting day. For some, sign-on came in the predawn darkness. For others 7:00 A.M. will arrive with the "Today Show," "CBS Morning News," or "Good Morning, America." In foreign countries, 7:00 A.M. ushers in news, special-feature programming, entertainment, and public affairs.

Sign-on preparations are also bustling at this hour in many school systems. A closed-circuit television system warms up to "broadcast" the daily calendar of events, students begin to produce a morning news program, and teachers preview instructional television lessons that they will incorporate into afternoon lectures. At a nearby college, a professor is preparing a lecture that will be aired over a statewide educational television network. In a famous medical school, a television camera focuses on the operating table (Figure 8–1), broadcasting a color picture to interns in an observation room across campus. It is all part of the world of educational broadcasting.

Figure 8–1 (Division of Audio/Visual Services, Johns Hopkins Medical Institutions)

ETV—the beginnings

Although a closed-circuit television system was in use at the State University of Iowa as early as 1932, it was in 1938 that the first over-the-air experimental broadcast for educational purposes took place in cooperation with NBC and the School of Commerce of New York University.[1] The broadcast was arranged by Dr. James Rowland Angell, who was then educational director of NBC. From a studio on the third floor of the RCA building, the program consisted of "an explanation and demonstration" of television, broadcast from the transmitting tower on top of the Empire State Building. A class of 250 students seated in a large auditorium on the sixty-second floor of the RCA building viewed the program. A two-way radio hookup connected the studio with the auditorium. Capturing the flavor of the event, program instructor Professor C. C. Clark recalled that he asked one student in the auditorium to come to the studio to have a question answered. About ten minutes later when the student arrived at the studio and appeared on the screen, the group in the auditorium broke into applause.

The Experimental Era

The early 1940s were years of continued experiments with the new medium. The Metropolitan Museum of Art in New York arranged with CBS to televise its painting collection. Francis Henry Taylor, director of the museum, predicted television would be "just as revolutionary for visual education as radio was for the symphony and the opera."[2] The following year saw such mass-oriented educational television programs as New York's WCBW broadcast of a series of first aid programs in cooperation with the American Red Cross. Programs of a more informative and educational nature during the height of World War II, included one from Schenectady, New York, on blood plasma.

Early enthusiasm for educational television was sidelined by World War II, but when the war ended the industry began to concentrate again on educational television. NBC announced the first "permanent" series in educational broadcasting, "Your World Tomorrow."[3] Some of the early program titles in the series included "The Mighty Atom," "Jet Propulsion," and "Huff-Duff, the Radio Detective." The network secured the cooperation of the New York City Board of Education to have students watch the programs in special "viewing rooms." The students then evaluated the programs. On a very limited scale, this was an early example of the systematic evaluation of educational programming.

Despite the encouragement from the networks and the willingness of certain school officials, educational television was a long way from widespread acceptance. As late as 1947, the *Journal* of the National

Education Association reported the efforts of the state of Virginia to make the transition to what was termed "visual education."[4] Although Virginia was known for its pioneering efforts in the field, the report never even mentioned educational television. The medium had not been able to rise above all the movie projectors, slide projectors, charts, models, and posters of the typical classroom. In the same year, a survey of elementary teachers studied the skills and knowledge necessary to use audio-visual aids.[5] Out of 42 survey items, which included mechanics, utilization, production, and facilities, none referred to television.

ETV Gains Acceptance

Finally at the turn of the decade, it began to change. In 1949, Crosley Broadcasting awarded a fellowship to a Kentucky high school principal, Russel Helmick, to "carry on research of how education by television can best serve the needs of the general public." The broad descriptions assigned to Helmick's charge illustrate the early survey approach to researching educational television:

1. Careful sifting of the literature of radio education to discover mistakes to be avoided and lessons helpful in investigating the educational possibilities of television.
2. Analysis of the television programs available for possible correlation with adult-education programs and the curriculum at university, high-school, and elementary-school levels.
3. Canvassing of school and home facilities and equipment for utilizing video programs.
4. Study of teacher interests and attitudes toward correlation of their school offerings in the curriculum with cultural and educational programs from television stations.
5. Investigation of pupil attitudes and interests in such cultural and educational areas as history, geography, English, science, and physical education and sports in relation to utilization of appropriate television programs.
6. Investigation of the educational levels at which television can be made most effective—adult education, colleges and universities, high schools, and elementary schools.[6]

Thirty years later, more narrowly defined and highly sophisticated research was still conducted within the very broad parameters of Helmick's goals.

Then in 1950, public awareness of the importance and potential of educational television rose when Dr. Earl J. McGrath, U.S. Commissioner of Education, appeared at hearings before the FCC and called for at least one channel in every broadcasting area to be reserved for educational purposes. McGrath suggested "that it is vital to the continuous improvement of public education that every school system and college competent to produce educational television programs and financially able to construct and operate a station be assured that, when the time comes that it is ready to start construction of a television broadcast station, a suitable locally usable transmitting frequency will be available."[7] The FCC responded favorably.

Organized Support for ETV

Organized support for educational television came in the early fifties when the American Council on Education coordinated the formation of the Joint Committee on Educational Television (JCET). The committee brought together seven supporters of ETV, all organizations which had originally called upon the FCC to hold hearings on the subject. Financial commitment was also provided by a $90,000 grant from the Ford Foundation. One of the committee's main goals was to assist educational institutions in establishing stations. The first chairman of the JCET was Dr. Edgar Fuller, then executive secretary of the National Council of Chief State School Officers, one of the seven member-organizations of JCET.

Other ETV financial support went directly to colleges and universities. Syracuse University received a $150,000 gift to offer graduate programs in radio and television. In the fall of 1950, Syracuse announced the new degree of Master of Science in Radio and Television.[8]

The medium even gained some artistic legitimacy when *Variety*, the show business weekly, reviewed a "University Tele-course" program aired on the Cleveland, Ohio station, WEWS. *Variety* called the program a "preciously packaged mine of informational nuggets," and "a fast-moving, easily digested, highly accredited performance."[9] Few professors in the classroom could have been so enthusiastic.

The FCC, as part of lifting its freeze on new licenses, allocated 242 channels for educational use. The first to take advantage of the newly allocated frequencies was the University of Houston. Station KUHT went on the air in 1953 (Figure 8–2). But the expensive facilities and television equipment necessary for transmission prohibited the rush to the marketplace that the FCC had anticipated. Nevertheless, educational television had delivered its firstborn.

As the decade progressed, forecasters had educational television helping to teach the huge enrollments predicted in the 1960s and 1970s. Educational television was used more widely, and state systems of educational television were created. But by the end of the decade, the honeymoon was beginning to pall, and educators were beginning to take a more critical look at teaching by television.

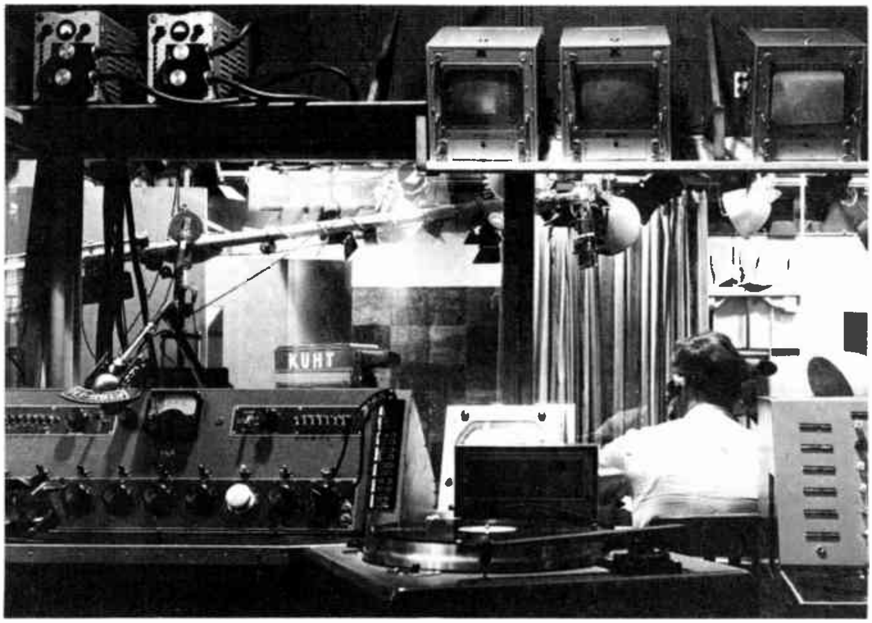


Figure 8–2 KUHT-TV's early studio. (Office of Information of the University of Houston)

Critical Evaluation of ETV

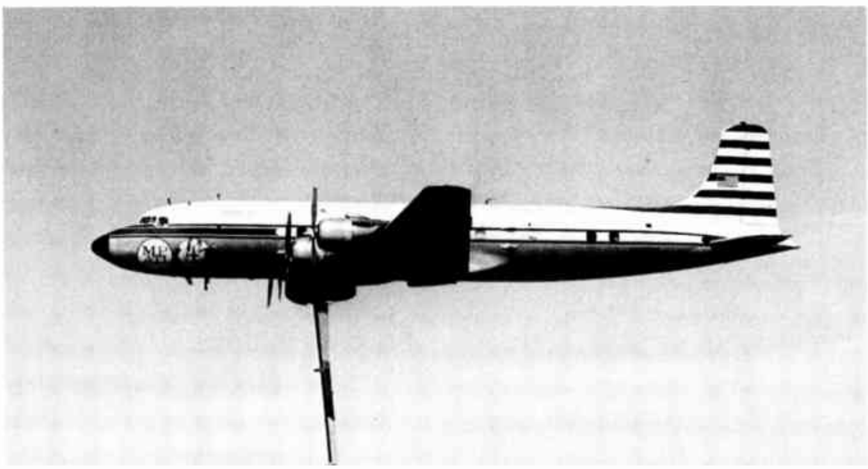
Arguments both for and against ETV surfaced rapidly.[10] In some ways, the controversy was a compliment to the influence of the new teaching tool. Both sides did agree that more research was needed to determine the true assets of ETV. Teachers were beginning to object to administrators' requests for teaching time on television on top of their already crowded classroom schedules. They also wanted to participate more in planning instructional television from the very beginning of program formulation. Such practice is now routine for developing good instructional programming. The thought of television as a substitute teacher, understandably, received considerable resistance. Classroom teachers were fully aware that the interaction between student and teacher contributed to much of the learning process. They appreciated television's particular abilities but were protective of their own role in the student-teacher interaction.

The public's focus on the economics of educational television also concerned educators. The politicians' and taxpayers' misconceptions of a medium that could eliminate personnel and save taxpayers' money was worrisome. They realized that they had to reemphasize the importance of the teacher in the classroom. They faced still another economic concern—the proportionate share of financing that educational television would receive. Television studios could easily incur bills in the hundreds of thousands of dollars. Money like that not only could pay several salaries but also could provide many of the "traditional" classroom teaching aids. One of the most ambitious projects undertaken was the Midwest Program for Airborne Television Instruction (MPATI).

airborne ETV—the MPATI experiments

The lumbering DC-6 (Figure 8–3) taxied down the runway, its motors roaring in unison. Inside, highly trained technicians sat with their sophisticated electronics gear and waited until the big bird was airborne. It was early morning. Continuing its climb to 20,000 feet, the pilot leveled off. Reaching its destination over northeastern Indiana, the plane was in position for its target—thousands of school children waiting patiently below. The cargo was television programs, broadcasting such subjects as Spanish, French, history, and science to the outlying rural areas of Indiana, Illinois, Kentucky, Michigan, Wisconsin, and Ohio. Called MPATI, for Midwest Program for Airborne Television Instruction, it was an idea conceived seven years earlier in 1944 by a Westinghouse

Figure 8–3 Circling above the Midwest, the specially equipped plane for the Midwest Program for Airborne Television Instruction brought instructional television to a wide geographical area. In concept, it was the forerunner of the ATS satellite systems discussed in chapter 5. (Purdue University Archives)



Electric Corporation radar expert named Charles E. Nobles and with the persistence of a colleague, Westinghouse engineer Ruben Lee.[11]

The Theory behind MPATI

The idea of taking the television station into the sky had been fixed in Nobles's mind. Theoretically, it would raise the television tower to 23,000 feet. The distance then covered by this signal would expand to include a potential half-million pupils. Nobles reasoned that the plane must have a special gyroscope-controlled antenna that would always remain vertical, regardless of the position of the aircraft. Upon reaching its position over Indiana, the DC-6 would then fly in a tight pattern of twenty miles, beaming its signals to the states below.

Funding and Software

The project succeeded with support from a number of organizations. MPATI contracted with Purdue University to furnish maintenance and other support personnel for the aircraft. Due to its proximity to the target area, the plane was based at the Purdue airport. Local school systems using MPATI programs contributed a nominal amount of money to buy equipment to receive the programs. Dr. J. A. Hutcheson, then Westinghouse vice president in charge of engineering, aided the project by applying to the Ford Foundation for funds. Ford responded with an initial $6 million. Major national education organizations such as the National Education Association, the Parent-Teachers Association, and the U.S. Office of Education threw their support behind the experiment.

The MPATI program, despite its popularity, did not last. Satellite communication soon overshadowed its usefulness with antennas 23,000 miles high and signals that could span large sections of entire continents. The MPATI plane that made its first broadcast in 1961 made its last in 1968. The organization stayed in limited operation until 1971. Yet the novel effort definitely pioneered research for future satellite experiments when small communities again would receive educational television programs, this time from outer space.

educational versus instructional broadcasting

In its formative years, the range of television's experiments from MPATI to televising art masterpieces for the public all were considered examples of educational television or ETV. The programs were truly designed to educate. For our own purposes, we shall define ETV as *all noncommercial television programming and commercial programming produced especially for* *educational purposes, whether or not the program is used for direct classroom instruction.*

As educational television matured and more and more uses of in-school programming were developed, the word *instructional television* evolved. Although both terms still tend to be used interchangeably, instructional television refers to programming specifically designed for use in the classroom or in a direct teaching role. Notice we did not use the words "in-school" in our definition. Both ETV and ITV are employed beyond the confines of the classroom. Differentiating between the two terms also is important for economic and political reasons.[12]

Remember that criticism of ETV reached full force in the 1960s. Part of this criticism went beyond the classroom to the policy issues. Because much of the programming of ETV stations was designed for in-school use, and because major federal funding was emerging, some saw the potential threat of a national school system under federal control. Congressional advocates of ETV were charged with maintaining the ETV movement as "a sinister conspiracy directed from the U.S. Office of Education to homogenize the nation's moppets by a standardized curriculum spread from sea to shining sea."[13] This furor caused ETV stations to stop and seriously consider from where their future programming dollars would come.

During this same time, smaller portable videotape equipment arrived in the marketplace. Such equipment permitted many educators still to tinker with television but this time without the threat of outside controls. For school administrations, the portable equipment was particularly satisfying, since they could buy inexpensive television equipment with local money and avoid the public criticism caused by large federal expenditures. Although new, the idea of airplanes and satellites beaming federally funded programming to local school systems was sold most easily to both school officials and taxpayers as "strictly experimental" in nature. The portable equipment satisfied those who demanded new technology in the classroom. Instead of educational television for large numbers of students, something new appeared, instructional television (ITV) used strictly for in-classroom use with programs often produced by the teachers themselves.

integrating educational broadcasting into the learning experience

To understand fully educational broadcasting's relationship to the teaching and learning process, it is important to learn its relationship to other forms of educational presentations. To illustrate these interrelationships, we shall use a model called the Cone of Experience (Figure 8–4), developed by audiovisual specialist Edgar Dale.

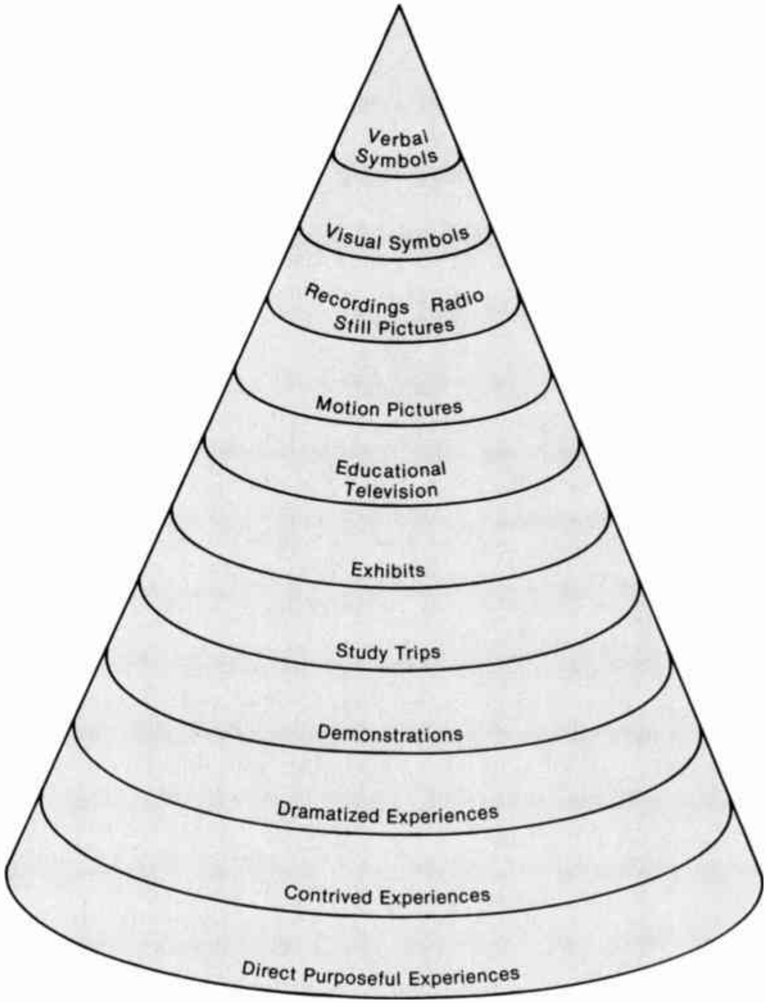


Figure 8-4 Edgar Dale's Cone of Experience. (From *Audiovisual Methods in Teaching*, Third Edition, by Edgar Dale. Copyright © 1946, 1954, 1969 by Holt, Rinehart & Winston. Reprinted by permission of Holt, Rinehart & Winston.)

Dale's Cone of Experience

Viewing the cone from the base up, we can see that it represents different levels of abstraction, each part of the learning experience. Dale uses Jerome S. Bruner's concepts as analogies to his Cone of Experience. Bruner analyzes three major modes of learning: "the *enactive* (direct experience), the *iconic* (pictorial experience), and the *symbolic* (highly abstract experience)."[14] At the base of Dale's cone are the more direct experiences, or enactive ones. The mid-section represents the more abstract experiences, and at the top area of the cone, the symbolic experiences. It is important to understand that the cone represents different levels of abstraction, not of difficulty. The bands of the cone also are interrelated. They are "fluid, extensive, and continually interacting."[15] For example, although the very tip of the cone represents verbal symbols, an educational television program would also contain those same verbal symbols, as would other experiences lower on the cone.

Let us apply the Cone of Experience to a game of tennis. We can make the analogy that at the very bottom of the cone, the direct purposeful experiences refer to our actually playing the game. Farther up on the cone we might experience a demonstration by watching a game of tennis, either in person, or still higher on the cone, on educational television. At the very top of the cone, in our own minds we might conjure up the "image" of tennis upon hearing the word, or verbal symbol "tennis."

Choosing the Correct Presentation

By now you are probably beginning to see how we choose which presentations to use to teach tennis. If, for example, you had a champion tennis instructor, superb courts and equipment, a select group of students, and plenty of time for individual instruction, the best teaching method would not be to make a program about tennis. The best instructional choice would be "direct, purposeful experiences" on the tennis court with actual equipment playing with the instructor as your partner.

Choosing the level of abstraction to teach our game of tennis now begins to include other factors. For example, perhaps the students have already had experience with the game and merely want to review the basics. The television program may be just the help they need. Perhaps the class is too large and there is not enough time or personnel to teach each student individually, but before working with them on the court, it is more efficient to teach them first the basics through the television. The program thus frees the instructors to concentrate on teaching skill and strategy.

We could produce this program and place it in a learning resource center from where it can be checked out and viewed in special study carrels at the students' convenience. If they do not understand the program, they can play it back as many times as necessary until they feel they have mastered the material.[16]

Now that we understand how educational broadcasting fits into the learning process, let us learn more about the actual process of producing an accountable program.

the quest for accountability: developing quality ITV programming

Almost anything significant that occurs in a local school system becomes the concern of the community. Students, parents, teachers, school-board members, and even the legislature all are involved. The educational process, in its simplest terms, attempts to provide the most for the taxpayers' dollars. This quest can reach extreme levels, as in Oregon where taxpayers have refused to approve school budgets, forcing some schools to close. It also prompts hard questions asked at PTA or school board meetings. Thus, it is only natural that people are concerned about ITV. The public, parents, and policy makers want to know if ITV is worth the money. Are the expensive facilities paying for themselves in student benefits? Does the type of programming really teach something or is it just background entertainment?

The result of this probing is the trend toward increased accountability in developing ITV programming. In a statement before a congressional hearing, learning authority P. Kenneth Komoski noted that less than one percent of the tapes now on the market are learner verified.[17] Komoski meant that although programs are produced to teach something, it does not mean learning will be achieved by simply viewing the program. Most programs simply have not been tested, so program developers are beginning to ask questions. What do we really want to teach with this program? What are its objectives? What is the best way to present this material? What techniques can we use to keep the student interested while learning? How much entertainment can we include without digressing from the basic subject matter? In a very real sense, such accountability affects people as well as programs. The person in charge of ITV program development is responsible for the overall effectiveness of ITV in the school setting. The director of the instructional television studio also must justify the increased budget to the school board.

transition to public broadcasting

In the mid 1960s as ITV programming switched to local production and distribution, educational television stations, their programming supplemented by locally produced videotape material, began to move toward a greater variety of programs beyond in-school programming. At about the same time, foundations and government agencies were supporting not only in-school production but also the development of state and national systems of noncommercial broadcasting. In 1962 the Educational TV Facilities Act provided over $30 million over a five-year period to develop state systems of educational broadcasting. Many of these state systems operate today as an integral part of a larger national system of noncommercial radio and television stations.

The Carnegie Commission and CPB

Full-scale planning for what would eventually become a national system of noncommercial radio and television stations began in 1965 with the Carnegie Commission for Educational Television. The Commission, whose members were a broad range of industry leaders, was charged with conducting a "broadly conceived study of noncommercial television and to focus attention principally, although not exclusively, on community owned channels and their service to the general public." The commission's report concluded that a "well financed, well directed educational television system, substantially larger and far more persuasive and effective than that which now exists in the United States, must be brought into being if the full needs of the American public are to be served."

The Public Broadcasting Act of 1967

The commission's recommendations were the impetus for the passage of the Public Broadcasting Act of 1967, which allocated $38 million dollars to the improvement and construction of new facilities for noncommercial radio and television in the United States. Also formed by the act was the Corporation for Public Broadcasting, a quasi-government company established to administer the public broadcasting funds appropriated by Congress.

The act authorized the CPB to:

> *Facilitate the full development of educational broadcasting in which programs of high quality, obtained from diverse sources, will be made available to noncommercial education television or radio broadcast stations, with strict adherence to objectivity and balance in all programs or series of programs of a controversial nature;*
>
> *Assist in the establishment and development of one or more systems of interconnection to be used for the distribution of educational television or radio programs so that all non-commercial educational television or radio broadcast stations that wish to may broadcast the programs at times chosen by the stations;*
>
> *Assist in the establishment and development of one or more systems of noncommercial educational television or radio broadcast stations throughout the United States;*
>
> *Carry out its purposes and functions and engage in its activities in ways that will most effectively assure the maximum freedom of the non-commercial educational television or radio broadcast systems and local stations from interference with or control of program content or other activities.*

With passage of the act, noncommercial radio and television stations became known as "public" broadcasting stations, signifying their ability to secure income from the public as well as from corporations, foundations, and government agencies.

distributing programs: PBS and NPR

Public broadcasting stations which meet certain operating standards are eligible for financial support from the CPB. Such stations also belong to National Public Radio (NPR), the radio network of public broadcasting, or the Public Broadcasting Service (PBS), the television network of public broadcasting.

The Public Broadcasting Service—PBS

To help meet the goals of the 1967 act, CPB joined with many of the licensees of noncommercial television stations in the United States and in 1970 formed the Public Broadcasting Service (PBS), which today is the primary distribution system for programs aired on public broadcasting stations. In 1979 the PBS board of directors approved a three network satellite-fed distribution system permitting stations to choose from (1) general entertainment mass appeal programs; (2) regional programs of special interest; and (3) instructional programs.

In some ways PBS is similar to commercial television networks, in that it is a distributor of programs. At that point, however, most of the similarity stops. Whereas the commercial affiliates are part of affiliate organizations which advise networks, PBS is in many ways more sensitive to its affiliates. In a sense the affiliates represent the public who, at least in theory, "owns" the public broadcasting stations through public contributions and tax dollars.

Part of this sensitivity is generated by the PBS board of directors responsible for the governance of PBS. The board represents the general public and station managers and gains insights into the success and failure of its system. It is a good, broad-based indicator on which to base decisions.

In addition to the board meetings, PBS initiates a series of semiannual regional meetings called *round robins*. In round robins, PBS officials travel around the country and talk to public television station management. Later, all managers get a briefing paper, a synopsis of what occurred in the meetings. Another means of feedback are vote tabs, which are electronic questionnaires sent to affiliate stations via the nationwide teletype system. The system connects all of the PBS stations with each other and with the network offices in Washington, D.C. (Figure 8–5). If PBS wants to poll the affiliates about something, it sends a question by teletype to each of the PBS stations. Each station can then answer the question by teletype. The responses from all of the PBS affiliates then are tabulated at the network headquarters.

National Public Radio—NPR

Radio also benefited from the Public Broadcasting Act, and in 1971 many noncommercial radio stations became members of National Public Radio, the radio equivalent of PBS. The two differ, however, in that NPR also produces programs, whereas PBS's chief responsibility is distribution. NPR affiliates also produce programs which often are syndicated by NPR and made available to member stations. One of the most famous programs aired on NPR is the daily news-magazine program "All Things Considered," acclaimed by both educators and the public for its informative, in-depth coverage of news and public affairs. NPR's growth has been closely aligned to the overall growth of noncommercial radio.

Like PBS, NPR also is sensitive to its affiliates. It holds semiannual round robins, and the NPR Board is sensitive to feedback from its members. NPR also conducts four workshops per year, which are more "how-to-do-it" meetings than discussions of issues, but nevertheless en-

Figure 8–5 Connecting point for the PBS communication teletype link with affiliate stations. (Stan Cahill & PBS)

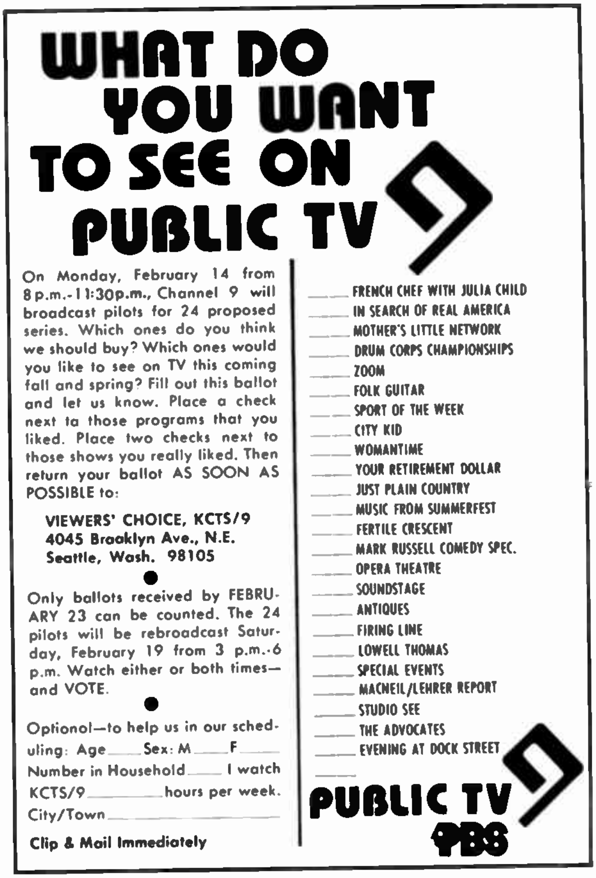
courage interaction between NPR officials and local public radio broadcasters. An annual conference of station managers is another means by which the network can learn about issues affecting its affiliates.

selecting programs for public television: the Station Program Cooperative

One of the biggest differences between public and commercial television is the process by which PBS selects the programs that will become part of the regular schedule fed to affiliate stations. Each year, Public Broadcasting Service affiliates participate in a series of "bidding" rounds to determine which television programs you will see on public television. These bidding rounds use direct feedback in the form of financial commitments from affiliates. In commercial broadcasting, programs are picked by network planners and executives, but in public broadcasting, the individual stations make the decisions. The process is called the *Station Program Cooperative (SPC).* It began in 1974 as an experiment to see if local public broadcasting affiliates were willing to commit money to purchase programs for network distribution. The process has since been revised considerably. Currently, the "bidding" in the cooperative is held three different times during the year.

To understand how the SPC works, imagine you are the manager of a public broadcasting station. You have a certain amount of money to spend on programming and, along with other public broadcasting stations nationwide, you will help determine which programs will reach network distribution. You will receive a catalogue of the shows being considered for the late winter bidding round and are even invited to preview them. You decide to show them to your audience and give them a chance to vote on which show they would like to see. You publish a ballot for your viewers in the local newspaper (Figure 8–6). You tally the returned ballots and decide to commit a portion of your programming budget to the most popular shows. You send your financial commitment to PBS, which tallies yours with the rest of the affiliates to determine which shows received the most support, both popular and financial. These shows then will appear as part of the fall lineup.

You still have two other bidding rounds in which to choose programs and to participate in the network program selection process. Also, if there were a special program offering at some time other than the regularly scheduled SPC rounds, you could bid on this as well. The entire process is one of feedback from your station and the other public television stations to determine network programming. It directly involves both the audience and the station before the programs even are aired.



WHAT DO YOU WANT TO SEE ON PUBLIC TV

On Monday, February 14 from 8 p.m.-11:30p.m., Channel 9 will broadcast pilots for 24 proposed series. Which ones do you think we should buy? Which ones would you like to see on TV this coming fall and spring? Fill out this ballot and let us know. Place a check next to those programs that you liked. Place two checks next to those shows you really liked. Then return your ballot AS SOON AS POSSIBLE to:

VIEWERS' CHOICE, KCTS/9
4045 Brooklyn Ave., N.E.
Seattle, Wash. 98105

●

Only ballots received by FEBRUARY 23 can be counted. The 24 pilots will be rebroadcast Saturday, February 19 from 3 p.m.-6 p.m. Watch either or both times—and VOTE.

●

Optional—to help us in our scheduling: Age____ Sex: M____ F____
Number in Household____ I watch KCTS/9______ hours per week.
City/Town__________

Clip & Mail Immediately

____ FRENCH CHEF WITH JULIA CHILD
____ IN SEARCH OF REAL AMERICA
____ MOTHER'S LITTLE NETWORK
____ DRUM CORPS CHAMPIONSHIPS
____ ZOOM
____ FOLK GUITAR
____ SPORT OF THE WEEK
____ CITY KID
____ WOMANTIME
____ YOUR RETIREMENT DOLLAR
____ JUST PLAIN COUNTRY
____ MUSIC FROM SUMMERFEST
____ FERTILE CRESCENT
____ MARK RUSSELL COMEDY SPEC.
____ OPERA THEATRE
____ SOUNDSTAGE
____ ANTIQUES
____ FIRING LINE
____ LOWELL THOMAS
____ SPECIAL EVENTS
____ MACNEIL/LEHRER REPORT
____ STUDIO SEE
____ THE ADVOCATES
____ EVENING AT DOCK STREET
____

PUBLIC TV
PBS

Figure 8–6

the scope of public television programming

Today, public television has become a system of broadcasting with a wide variety of programs ranging from the traditional "instructional" programs used for in-school purposes to programming with a wide national and even international appeal.

"Sesame Street" (Figure 8–7) and "The Electric Company," for instance, both have wide audience appeal beyond the preschool and elementary school audiences they are designed to attract. Another example with similar appeal is "The Big Blue Marble" which seeks to assure children that other children around the world have experiences similar to theirs. Still another program with national distribution and appeal is WNET-TV's "The Adams Chronicles," depicting the history of America's

Figure 8–7 Big Bird of "Sesame Street." The television program has been the recipient of many awards for creative programming. (Courtesy of the Children's Television Workshop)

famous Adams family of presidential fame and its role in history from 1750 to 1900. Some programs, such as "The Adams Chronicles," have accompanying teacher and curriculum guides, which are especially helpful when the program is used in the classroom.

Regional programs also have reached a broad-based audience (Figure 8–8). "Mr. Rogers," which started out as a regional program on WQED-TV in Pittsburgh, has become popular nationally. This and other regional programs are making inroads into the typical cartoon fare so common to children's television.

Many colleges are taking advantage of the "outreach" programs, employing ITV to reach adults who may not want to take the trouble of coming to campus, or because of the distance and time, simply cannot come. As a result, television colleges are prospering. The Public Broadcasting Service has offered such "nationwide" courses as "Classic Theater" and "The Ascent of Man." The programs were telecast over PBS stations, and many colleges offered credit for viewing them and passing examinations on them. Colleges list the television courses as part of their regular schedules, enabling students to enroll for them as they would for any other course.

Figure 8–8 Fred Rogers, star of "Mr. Rogers' Neighborhood," is one of the pioneers of public broadcasting. (Copyright, Family Communications Inc.)

In addition to the TV college, public television also finds its way into classrooms as a supplement to lectures. A perusal of one ETV supplier's catalogue, the Great Plains National Instructional Television Library of Lincoln, Nebraska, reveals how broad this scope is. For example, under the heading of language arts, you can choose from "Language Corner" for grade 1, "Ride the Reading Rocket" for grade 1, "Word Magic" for grade 2, and eleven other language arts possibilities. "Language Corner" has thirty, 15-minute programs with such titles as "Listening," "Fairy Tales," "Story by the Teacher," "Letter Writing," and "Speech and Telephone." These are just some of approximately 150 different programming series from which to choose. Programs in a given series may have from two or three lessons to more than sixty lessons. The program "Mathemagic," produced by Channel 33 in Huntington, West Virginia, features sixty-four lessons for second-grade youngsters (Figure 8–9). The goals of the program include improving computational skills through a better understanding of the numbering system and developing problem-solving ability through an interchange of mathematical and verbal language.

Some of the programs are specially designed for summer viewing to help students retain the skills achieved during the academic year. For example, a language arts series entitled "Catch a Bubble" was produced by WNIN-TV of Evansville, Indiana, for a local school corporation. The program is now nationally syndicated and has four thirty-minute lessons for students who have completed the second grade. The star of the show

Figure 8–9 A scene from "Mathemagic." The program features 64 lessons for second-grade youngsters. (Great Plains National Instructional Television Library)

is a seahorse named Salty. The children share Salty's adventures while reinforcing learning skills and maintaining their interest in reading during the summer vacation. Along with viewing the program, the student also works in the "Catch a Bubble" activity book.

Among programs offered by other suppliers is "Time-Life Multimedia," which explores the social sciences, language arts, humanities, sciences, business, and recreation. If you are interested in archeology, you might want to view "How Old is Old?," which discusses the age of the Grand Canyon, explores the history of man, or probes the longevity of the ice cover of Antarctica. Or if you are interested in dinosaurs, you might want to watch "The Dinosaur Hunters." This program studies how the dinosaurs reproduced. Then there is "Digging up the Past," which examines relics of ancient civilizations. Other archeological programs include "Cracking the Stone-Age Code," "Lost World of Maya," and "Ancient Egypt." Many of the programs are in both English and Spanish and are on film or videotape.

With the interest in metric conversion, mathematics programs which teach the metric system are becoming popular. Typical of these is "Metrify or Petrify," a series of eight, 30-minute programs produced by KLCS-TV in Los Angeles and distributed nationally. The programs include an introduction to the metric system, linear measurement, volume measurement, mass versus weight, temperature, times, and an overview of the metric units of measurement.

public radio as instructional radio

Because of television's dominance, radio tends to be overshadowed as a medium with both educational and direct instructional value. It should not be, because in many places, radio is as much and sometimes more a part of the educational scene as its visual counterpart is. It certainly has been in use longer.

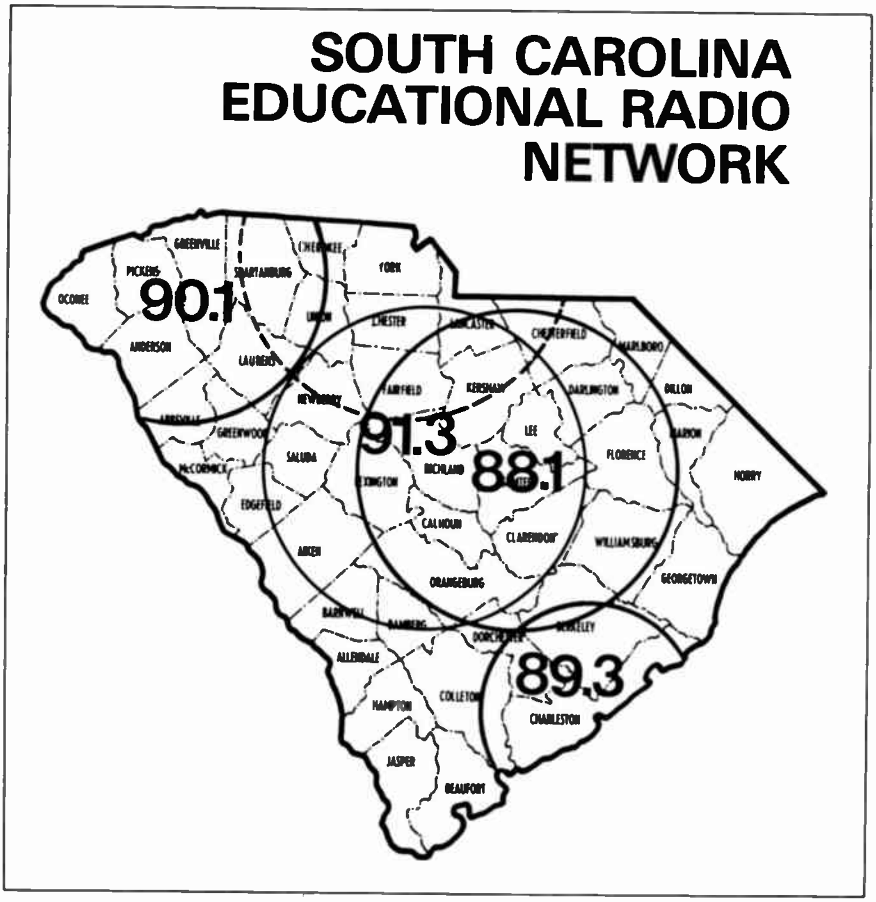
As we learned in chapter 3, one of the first radio stations in the United States crackled on the air at the University of Wisconsin in 1919. Through the years, WHA radio served a wide spectrum of listeners with direct instructional programming. In fact, it was the flagship station of an entire state instructional radio network. What was WHA's effect? By the late 1950s, schools in Wisconsin had been listening to instructional radio for almost thirty years. The director of the Wisconsin State Broadcasting Service and former WHA director, Harold B. McCarty, told a Washington, D.C. conference on educational television that educational radio was alive and well.[18] He told television enthusiasts of some tough goals to match. At that time the Wisconsin system had 100,000 pupils enrolled in creative art classes by radio, 70,000 in music, and 43,000 in a social studies class.

Today, educational and instructional radio programs are found at many colleges. WBAA at Purdue University has long had a viable instructional program and has not only been responsible for major research in the field, but also has had a regularly scheduled offering of college courses taught exclusively by radio. The university charges a nominal fee for the course, and the student enrolls just as he or she would for any other course. Lectures are broadcast mostly in the evenings and are repeated on Sundays. Tapes of the courses are available in Purdue's audio-visual center and can be checked out for review. The student receives credit by taking an examination at the end of the semester. Although credit is given, no final grade is assigned. Students must, however, maintain at least a *C* to obtain credit. The university maintains no record of those who fail the test and consequently receive no course credit.

Some states also operate major instructional radio networks. South Carolina, for example, simultaneously links four noncommercial FM stations, WEPR at Greenville, WLTR at Columbia, WMPR at Sumter, and WSCI at Charleston, into a special instructional network. The stations are located at strategic points in the state, so schools over a wide region are within earshot of the broadcasts (Figure 8–10). The broadcasts are directed toward elementary grades through high school as supplements to regular classes, and teachers have found them effective in generating student interest. Each broadcast lesson is self-contained so if one is missed, it does not interrupt the regular classroom schedule. To facilitate reception, the state offers special radio receivers pretuned to the educational stations, although a standard radio receiver also works (Figure 8–11). Each participating station designates a coordinator to help teachers gain the maximum benefit from the broadcasts. Actual airings are scattered throughout the school day, and supplementary teaching materials are available to help teachers plan lessons around the broadcasts.

South Carolina is just one example of states with many instructional radio networks functioning at city and state levels. The medium is

Figure 8–10 (Public Telecommunication Review)



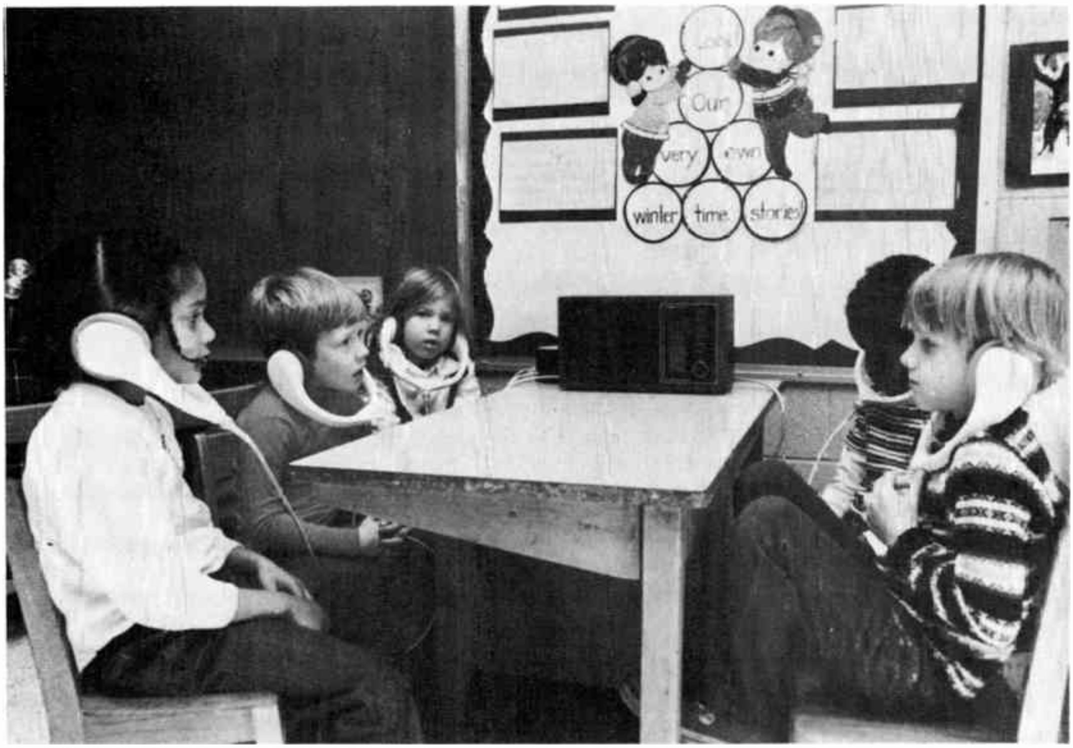


Figure 8–11 (South Carolina Educational Television and Radio Network and the South Carolina State Department of Education)

especially effective in teaching the great works of literature, music, foreign languages, and other subjects which particularly lend themselves to "audio" concepts.

funding and the future

The public broadcasting system in the United States has managed to survive criticism and erratic congressional support to mature into a viable and even competitive chain of stations serving most of the United States.

Yet many issues need to be resolved to ensure public broadcasting's future. Perhaps the most essential one is funding. In theory, if not in practice, the support for long-range funding of the system came in 1975 with the passage of the Public Broadcasting Financing Act of 1975. Signed into law by President Gerald Ford, it called for authorization of a five-year appropriation, but found the actual money tied to a separate appropriation measure, a measure which ran into trouble in the House Appropriations Committee. Currently, CPB-qualified stations receive $1.00 of federal funds for every $2.50 raised locally. Although clearly the burden of operating a local station rests on the public, few stations could operate without federal money.

In 1977 a task force successfully obtained funds for a second Carnegie Commission inquiry into public broadcasting. The questions asked were:

> What is the mission of public broadcasting in American society, and how can Americans best be served by this important national resource?
>
> How are quality programming and creativity to be fostered?
>
> What should be the nature of citizen involvement in public broadcasting?
>
> How can the local station cooperate with other community organizations—schools, churches, libraries, community groups, museums, and other institutions?
>
> How adequately can public broadcasting meet the needs of the special audiences such as minorities, women, children, adults interested in life-long learning, the disabled, or groups with particular interests?
>
> How will public broadcasting develop as a multichannel system and interact with growing technologies such as satellite, cable, and videodiscs?
>
> Over the next ten to fifteen years, how should public broadcasting be funded and at what levels?
>
> What should be the central and regional organizations and institutions in the system, and what should be their functions?[19]

General answers to the charge of the second Carnegie Commission came with a report released in January, 1979. Along with some strong criticism of commercial broadcasting, the report called for better ways to insulate the public broadcasting system against government influence. Funding increases were also called for which included raising the budget to $1.16 billion by 1985, $590 million to come partially from a spectrum fee charged commercial broadcasters. The report recommended a Public Telecommunications Trust, which would be autonomous and administrate the system and, under the Trust, a Program Services Endowment to deal with programming.

The report received wide play in the media and trade publications. As expected, commercial broadcasters were in some cases highly critical of the report. What effect the report will have and what the future holds for public broadcasting will be dependent on specific legislation. Overall the system is regarded as an important source for quality programming, much of which is not possible on commercial networks because of the competitive nature of the system and the need to garner audience ratings. Although public broadcasting is also concerned about getting and holding an audience, it has latitude in creative programming that commercial broadcasting simply has not been able to match because of competitive commercial restraints.

summary

The beginnings of educational and public broadcasting can be traced back to WHA at the University of Wisconsin. Signing on the air in 1919, WHA is considered the pioneer public broadcasting station in the United States. Educational television was used at Iowa State University as early as 1932. Support for educational television came in the early 1950s with the formation of the Joint Committee on Educational Television (JCET). With a grant from the Ford Foundation, the JCET became the early representative of educational television and assisted educational institutions both in getting stations on the air and in using educational television in the classroom.

One of the more novel early experiments was the Midwest Program for Airborne Television Instruction (MPATI). Using a converted airplane, television programs were sent over a wide area of the Midwest via a special airborne transmitter. Although the system eventually became obsolete with the introduction of satellites, it did prove that it was possible to integrate television into the learning experience in many schools simultaneously. With the increased use of portable equipment and educational television in the classroom, television became important to direct classroom instruction. At the same time, many stations which had been used mainly for instructional purposes began broadcasting to a more general audience.

After a series of foundation-supported evaluations of noncommercial broadcasting, Congress enacted the Public Broadcasting Act of 1967 which designated noncommercial and educational stations as public broadcasting stations. The act created the Corporation for Public Broadcasting, a quasi-governmental corporation funded by Congress to assist in developing a national system of public broadcasting. To aid in distributing programs to public stations, the Public Broadcasting Service and National Public Radio were established. Although PBS's first function is distribution of television programs to CPB-qualified stations, NPR both distributes and produces programs. The future of public broadcasting is tied to a number of important issues, such as how the system will continue to be funded, what relationship the public will have to the operation of the system, how minorities and handicapped people will benefit from the system, and what influence institutions and organizations should have on the system.

spotlight on further learning

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9

television in business and industry

FOCUS After completing this chapter we should be able to

- Discuss the growth of television in business and industry.
- Identify how television aids both internal and external corporate communication.
- Discuss examples of in-house corporate news and information programming.
- Explain how television is used for marketing and sales.
- Describe how television is used for in-service training.
- Understand the management-development uses of corporate television.
- Explain the application of television to in-house advertising agencies.
- Discuss the future of corporate television.

Across town at the manufacturing plant, the 9 o'clock whistle is about to blow. Inside, a television crew has just received an urgent message. "Contact the air mobile units! Alert the camera crews! We have a breakdown at Arctic Station One. They want us there by tonight." Telephone calls, checks with management, notification to the crew of the company jet—it all sets in motion a chain of events that by nightfall will lead to a complete television crew thousands of miles away at a power station in northern Canada. A generator manufactured by the company has broken down. When the repair crews start their job, television cameras will be there to record it. Later, back at the manufacturing plant, the videotape will be edited into an instructional television program to train future repair crews. It all is just one example of industrial television in action, a growing area of mass media far removed from the typical commercial television station.

growth and impact

The purpose of this chapter is to acquaint you with television in business and industry. It is an expanding field with many applications. How big is it? Based on 1977 data, more companies will use television in the 1980s than there are commercial television stations in the United States.[1] In addition, a variety of corporate television networks are developing. Communication consultant Judith M. Brush of D/J Brush Associates in New York City classifies a network as "an organization which distributes programming at least once a month to six or more locations away from the point of origin."[2] She also notes that "more then 40 of these networks have more than 50 viewing locations with at least half that number distributing programs to 100-plus locations. For example, Pepsico has more than 300 locations in its network, IBM has some 1,300 locations in 400 countries, and Bank of America has 1,100 locations."[3] What kinds of firms use television? One survey of the top 500 companies listed in *Forbes* magazine indicated "just over half were engaged in manufacturing, followed in order by financial institutions, utilities, retailers, natural resources, and transportation companies."[4]

Let's learn more about how the medium of television is used in the corporate setting.

in-house corporate news and information programming

Most of us think of television as the local network prime-time program or as the local television station's daily newscasts. For these programs, there are decisions on what stories to use, how to edit them, what the audience wants and what it should have, what graphics to use, which audio cuts to include, and many more. Those same decisions also are made everyday in places far from the network and newsrooms. They're made at corporations, where television production crews and "corporate newscasters" are preparing the daily newscast to be sent to employees at the downstate plant or through "corporate networks" to international offices.

Applications of Corporate Newscasts

Dow Chemical Corporation is one company which has daily television newscasts for its employees. When Dow president Paul F. Oreffice wanted better communications with Dow's 10,000 employees, he thought that television would be the medium to do the job.[5] Produced at Dow headquarters in Midland, Michigan, the Dow corporate newscast is five to seven minutes long and is broadcast through closed-circuit television systems to lunch-hour viewers. Topics such as company news, stock market reports, and safety procedures are featured. Other companies follow a similar process. Some even produce commentaries. Union Carbide Corporation produced one 29-minute tape reporting on its gases, metals, and carbon divisions.[6]

To diversified companies which are spread out over wide areas, corporate news programming is especially valuable. An oil company may consist of oil exploration, refineries, and gas stations, as well as the corporate office. How is it possible to link the people and activities of these varied enterprises? The main instrument for many companies has been, and still is, the corporate magazine or newsletter. Filled with pictures and articles about the corporation's activities, it is sent to all employees. Different parts of the company have their own "reporters" or "stringers" who contribute to the magazine. Now, although continuing the corporate magazine, corporations are turning to television. A gas station owner wins a community award; an oil rig worker is promoted; a pipe line crew starts a new project (Figure 9–1); a secretary is married—they all appear on the lunch-hour news program. The corporate news cameras catch it all and in living color.

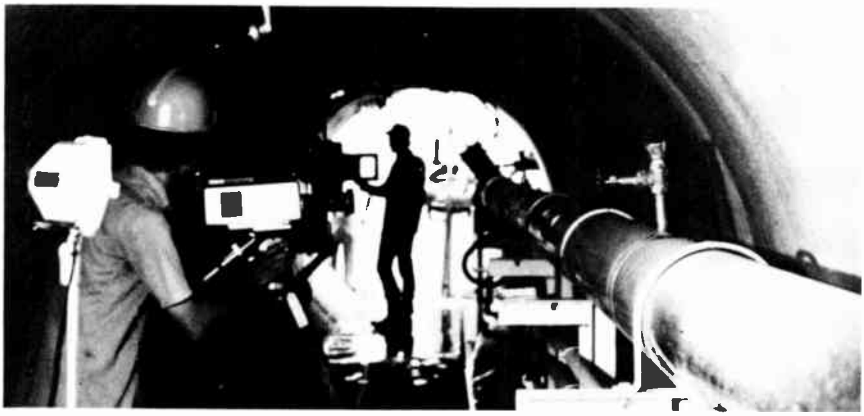

Figure 9–1 (Phillips Petroleum Company)

Content of Corporate News Programming

The scope of corporate news programing can be seen in one company, First National City Bank in New York. Consultant Eugene Marlow describes a daily news program called "Channel 6" seen by approximately 10,000 bank employees scattered throughout three buildings in New York City.[7] The show runs about 15 minutes and has three segments—news, a feature on some aspect of the bank, and one on entertainment. Content ranges from an interview with a bank employee to a report on the opening of a new headquarters a continent away. Features might be on computer programming, an interview with a professional magician, or one with a nationally famous artist.

Unique approaches are often used to communicate somewhat dry topics. First National City Bank had to inform employees of company benefits but wanted to do so in an interesting manner. "Channel 6's" solution was to use a puppet called Professor Wienerschnitzel (Figure 9–2). The professor finds himself in various settings all designed around a company benefit. On one occasion, he runs for mayor of New York, his platform being the scholarship benefit's program for the bank's employees. On another occasion, he practices his "voice and diction" for a speech he is to deliver on employees' insurance benefits.

Not all of what appears on "Channel 6" is limited to internal-bank programming. Cameras for "Channel 6" also venture into New York City to capture the after-hours activities of the bank's employees. For example, when a group of employees purchased group tickets to attend a hockey game, "Channel 6" interviewed some of the employee spectators on their reactions to the game. When the Ringling Brothers Circus came to town,

Figure 9–2 A discussion of employee benefits between the puppet "Professor Wienerschnitzel" and host Terese Kreuzer of Citibank's employee television news program "Channel 6." (Citibank)

"Channel 6" cameras had "ringside" seats. The bank's involvement in community affairs is also part of corporate news programming. This corporate programming combination has two effects: it is entertaining and informative—not much different from the evening's prime-time network news program.

Not all corporate news programming is as elaborate as that of First National City Bank. Dana Corporation's Reading Frame Division, for example, places news and information on a motor-driven wheel which revolves slowly in front of a fixed-position camera.[8] Each message or news story remains in view for fifteen seconds. The messages are broadcast around the clock, and television monitors are scattered throughout the plant's facilities. For Dana Corporation, the problem is reaching workers while they circulate through the plant (Figure 9–3), not at a centralized lunch location. Consequently, the monitors have become a substitute for many of the bulletin boards. At Dana, the concept of more elaborate corporate news is secondary to that of sending brief messages to employees in a short period of time via television.

General Information Programming

Corporate newscasts are not the only way to communicate with employees. Many companies produce special television programs to inform employees of the corporation's issues and concerns. For instance, a company's public relations efforts may be just as interesting to the employees as they are to the general public. How do the employees learn of these activities? The company produces special television programs on such topics as how the company is volunteering executives to help with the local United Way drive, how special volunteers are canvassing the city for the March of Dimes, or how children are being taught to swim and play sports at the corporation's summer camp in the mountains. Such programs may also fill the slots of public service programming on many commercial television stations.

Figure 9–3 On-line television monitors informing employees at Dana Corporation. (Dana Corporation)

Corporate policy can be disseminated effectively through television. New employees in large companies need to know such things as how to file insurance claims, where claims offices are located, and how they are staffed. The company can produce a television program spelling this out in detail, and the employee can view it at his or her own convenience. At first it might seem that a booklet could be just as effective. It would contain the same information. But the sound and motion of a courteous claims officer can set a positive example for the new employee, reducing tension and facilitating the process when he or she comes to file a claim. In addition, a welcoming statement from the president of a large corporation might mean much more when the president can be "seen" and "heard."

Another programming concept is the "state-of-the-corporation" address. Although we are familiar with the "state of the State" and the "state of the Union" addresses, we do not usually hear chief executives speak on the "health" of their corporations. Such information is usually given in the annual report accompanied by statistics, charts, and accounting jargon. However, many chief executives are learning that speaking to employees in an understandable language via television about how well the corporation is doing and its prognosis for the future can be an extremely effective way to communicate.

With the increasing number of federal regulations, many companies have had to scramble just to keep up with them. This has been especially true with safety regulations. A new governmental safety regulation may require educating thousands of employees and gaining their compliance. To help solve this problem, companies have produced television programs on safety procedures in their own particular plant surroundings. A manufacturing firm produced an "on-location" program detailing its fast moving equipment and their dangerous areas. An oil company took a television crew to a drilling rig to portray the protection necessary to prevent on-the-job accidents. Then, before new employees are assigned to one of the many drilling operations, they watch this series of safety programs. Such a series is much more efficient and effective than a foreman taking time and energy necessary to educate each new employee individually.

using television for marketing and sales

Television video cassettes have opened up a whole new world for many companies in the area of marketing and sales. Assume you are one of the nation's major automobile manufacturers. Your showrooms are full of new models, styles, colors, special performance features, and sales personnel who want to communicate all of this wonderful information to all of their potential car buyers. How do you secure the edge in this vastly competitive business? First, you amass the best sales tips and techniques from all of the dealers. Then using these, you have the central office prepare a special video-cassette tape showing a test driver effortlessly maneuvering the cars through their paces, while the accompanying monologue uses a narrator who would rival a network radio newscaster. It is simple electronic persuasion. By placing the video-cassette tape in the showroom playback unit, the customer is entertained with a professional television presentation (Figure 9–4). The local salesperson is still there to answer questions, add the personal touch, and sign the contracts.

Training Sales Personnel

One example of a company using television to train sales personnel and dealers is Deere and Company, manufacturers of the famous John Deere tractors and farm equipment. The company has a full-scale television

Figure 9–4 Videotape recorders are becoming part of the "tools" of the sales presentation at larger auto dealers in the United States. (Provided courtesy of Lincoln-Mercury Division)

production facility at Moline, Illinois, its company headquarters.[9] Replete with sophisticated computer editing equipment, the facility produces programs for all corporate activites, including videotapes which can explain to a dealer the advantages of using John Deere equipment (Figure 9–5). The company started to use television in 1968. At that time it was part of the audio-visual department and consisted of black and white equipment and two people to operate it. In 1973, the financial commitment was significant enough to equip a mobile van for color television production. A year later, television became a separate department in the company, outgrew its space in the corporate headquarters building, and moved to an office building in Moline. The facility now includes a 40′ × 40′ studio and 20′ × 32′ control room besides the mobile van and storage and office space.

The programs for dealers are only a few of the more than 75 programs produced each year by the facility. The Industrial Equipment Division alone uses two or three new programs every month as sales training aids. Programs are distributed to about 250 John Deere dealers in the United States and Canada, each equipped with playback units. They also are distributed to each of Deere's factories which also are equipped with playback units. The company has even enlarged its television production capabilities. Its Dubuque, Iowa Industrial Training Center now has television facilities and produces an average of 18 programs each year,

Figure 9–5 An example of major corporate commitment to television is John Deere's production facilities. (Deere & Company)

helping to inform both salespersons and customers about John Deere products.

Reliance Electric also uses television to help train sales personnel. The company produced its first videotape in 1975 and since then has been expanding the use of television throughout the company. Jerry Wilson, employee supervisor for the Electrical Group of Reliance Electric points out: "We have all the normal channels of communication between our main offices and the far plants and offices but, unfortunately, we have had no way to show motion. Motion is important to Reliance because that's what we sell . . . motors, drives, power transmission equipment and so forth. We build hard and softwear that cause things to move."[10]

Television can also benefit a typical sales meeting. Television solves the problem and communicates this "motion." Capturing the emotion and content of these brainstorming, pep-talking sessions on television has many advantages. First, it provides a record of what happens. The videotape takes notes, eliminating many procedural and secretarial burdens. Second, the tape can be given to sales personnel unable to attend. Perhaps the meeting is regional. The meeting can be videotaped and distributed to other regional offices for other sales personnel. In this way, the meeting also is not slowed down by too many participants. With professional editing, the highlights of the meeting can be produced into a half-hour program of high-intensity sales training, to be viewed by sales personnel throughout the company.

Consider another use. A company is having difficulty selling one of its products. Perhaps it is a special attachment for garden tractors. The problem is not company-wide, however; five sales outlets have had very high sales. Management decides to fly in the five sales representatives who have tallied the highest sales. For over an hour, they discuss how they sell the attachment, why customers find it useful, and the special techniques they use to convince customers that it is worth the money. The session is videotaped and edited into a 15-minute training program on that one product. The company then distributes the program to all of its retail sales outlets for the sales representatives. Immediately after viewing the program, sales begin to climb, and the program is hailed as a success.

A related use of the medium is keeping customers informed. When Owen-Corning Fiberglass® found certain raw materials in short supply, it needed to tell its customers of this problem, clearly and openly. So the company produced a television program with its purchasing managers discussing the problem. Ben Coe, Architectural and Home Building Products branch manager in Los Angeles, said the customers "could see what we were doing in our own mind to minimize the adverse effects. And since the program showed our own purchasing people in frank, candid discussion, the information came across very believably."[11]

Training Customers for Product Usage

Customers need to know how to use the products they buy. This may seem unnecessary for items like clothespins and detergent, but consider the computer. Many businesses are integrating computers into their overall operations. Mini-computers permit even the smallest companies to use this new technology. However, just because the computer is small does not mean that it is simple to operate. Even some small electronic calculators are difficult for the uninitiated to use. Although some manual training is normally included with many major computer purchases, it is time-consuming and does not solve the problem of training the employee hired after the computer is installed.

To help solve this problem, many computer manufacturing companies are developing their own training videotapes. These permit instruction in the new equipment without tying up the time of company personnel. For example, Honeywell has produced videotapes that instruct not only its own customers but also anyone else who needs to learn the basis of computer language. Honeywell's curriculum of video programs includes topics on FORTRAN, BASIC, Decision Tables, PERT, and DATA Base.[12] Its Video-Assisted Learning (VAL) program uses a multimedia approach combining video lecture material with readings and examinations. The courses are designed by educators, writers, and computer experts who develop, test, and review the courses.

in-service training

Besides being used to help sales and train customers, television is also used to teach employees new skills. Company X has just converted its order and shipping departments to computer technology. Before the conversion, an order was received, checked, and verified, and separate slips were made out for every item on the order. The slips were then distributed to the various warehouses at which the items were assembled. Finally, the shipping department received the individual slips and the master order from which to package the goods and prepare the mailing label. But the conversion ended all of this. Even typewriters have been replaced by visual display terminals. Now comes the task of training two entire divisions of the company to use the new equipment as well as to train the personnel of the company's branch plants located throughout the world. Company X accomplishes this through specially produced television training programs. It could have just as easily trained its personnel in the uses of a new telephone system or any other device. Television is especially useful in being able to go places where people may not. Hazardous locations, off-limits to many, become readily accessible to the television camera. The inside of a factory, the welder in a steel plant (Figure 9–6), the equipment operator in a coal mine—all can be captured on videotape using portable equipment.

One of the most difficult training assignments any company faces is educating equipment maintenance personnel. Every year new models are produced, new parts are required, and refinements are made. What about the person who must repair this equipment when it breaks down? How can he or she keep abreast of the latest developments? Again, television comes to the rescue. When a company introduces a new piece of equipment, it automatically produces a new television training program along with it. Company service representatives thus can learn how to fix the new equipment at their home locations scattered throughout the

Figure 9–6 (Inland Steel Company)

world. It is much less expensive than bringing together all the repair personnel each year for a new training program.

Along with management and employee training services, corporations are also using television to offer college-credit classes to employees. One example is in the Chicago area where employees at such companies as Illinois Bell, Western Electric, Motorola, and Standard Oil receive college credit from the Illinois Institute of Technology. The college programs are made in the ITT classrooms, but are sent via a special microwave frequency to the plants where they are received on standard television sets. Without the corporate link with ITT, students either would have to miss work or attend ITT night classes.

management development

High- and middle-level management people are constantly learning. Let's examine how corporate television helps.

The Executive Communicator

One area in which television is used effectively and frequently is in teaching management personal communication skills. Public speaking is a regular part of executive life. Speaking effectively is an important asset. With television, special speaker-training sessions can be used to videotape an executive's speech and then to play it back for criticism. In some cases, the speech is delivered before an executive panel that also criticizes the playback. Portable equipment also enables the executive to use television after hours in the privacy of his or her office without worrying about special technicians. Many companies also offer videotaped, short courses to help executives learn essential writing skills. In addition, principles of organizational communication can be taught using videotape. New executives can learn the structure of the organization as well as its rules and procedures in this way.

More and more often, television settings are being used to train executives in press relations. The business community frequently finds itself the subject of inquiry from the press, and few public relations directors can substitute for the chief executive when news such as a gas shortage surfaces. Many corporate executives have not been effective or convincing in such encounters. As a result, they now are receiving training in how to act and what to say in front of live television cameras while being pumped by reporters. This training is conducted under the lights of a corporate television studio while being interrogated by corporate personnel. The executives have dress rehearsals to gain skills in handling public encounters with the press.

Training Management Decision Makers

Television is also used to train management in everyday decision making, and especially in dealing with personnel. Videotaped models simulate such situations as firing employees, reprimanding them, or counseling them about a personal problem. After studying the tapes, a group of executives usually act out the different roles in these situations. Their role playing is also videotaped, then played back and compared to the videotaped models. This type of training often includes the advice of trained professionals who criticize the executives' performances.

Communicating with middle-level management can be aided by television, especially in highly technical industries in which the company is spread out over a large geographic area. For instance, suppose a supervisor in Mexico must train a group of assembly line workers in constructing a new product. This construction will mean changing many workers' jobs. Since such changes can cause serious personnel problems, the manager in Mexico watches a videotaped lecture by the supervisor at another plant at which the product already has been introduced. The supervisor tells what problems to watch for, how to solve them, and the effect of their solutions on other workers. The entire program is in Spanish. In other parts of the world, other supervisors can view the same lecture given in French, German, or Italian. Produced in the corporate headquarters, the program is an alternative to having executives fly all over the world with interpreters in order to start a new product down the assembly line.

An applied example of communicating with management by television is that of Holiday Inns.[13] With more than 1,600 motels around the world, the company has many managers to reach. Keeping them abreast of new corporate developments is accomplished by equipping each Holiday Inn with a videotape playback system. The company offers over 24 hours of video-based training programs from which to choose.

Another example is AT&T's Picturephone systems. These systems permit management at one location to communicate with management at another, across town or across the country, but this time they all view one another via television. This is done with the help of individual microphones in the Picturephone meeting rooms which voice-activate the cameras so that the cameras automatically switch to the person speaking. With the push of a button, the camera will select a composite picture of everyone at the meeting table.

We already learned about Dana Corporation's Reading Frame Division in the section on corporate newscasts. However, that is just one phase of the system. Much of the rest of it is used to help management make quick decisions with a minimum of paperwork.[14] At the desk of key executives is a television monitor equipped for multichannel reception. The executive can "tune in" almost limitless amounts of information, including charts and graphs of the day's production. In addition, at a given time each day, the company broadcasts on closed-circuit television investment and stock reports on one channel for the convenience of any Dana manager who wants to watch. This also can be seen on the monitor in the office.

in-house advertising

Although many companies hire advertising agencies to produce their television and radio commercials, some companies produce their own. After hiring skilled advertising professionals away from the agencies, the companies furnish them with creative facilities and establish in-house agencies, with most of the responsibilities and rights of a regular agency. One of these rights is the lucrative media commission paid to agencies by the stations for providing them with advertising business. Since this commission usually is 15 percent of the advertising budget for that station, in-house agencies even can make a profit for the company. At least they can make a return on their investment. One argument against such a system is that in-house agencies cannot view the company objectively and therefore often overlook the most creative approach. Another is that a company should stick to what it knows best—manufacturing the product—and leave its broadcast advertising up to the ad agency professionals. Still another argument is that not all media recognize in-house agencies and allow them the media commission. Among all of these pros and cons is the best arrangement for each company.

future perspectives of corporate television

How will technology and the relationship between employees and corporate media affect the future of television in business and industry? Already there has been much research on organization communication, but the study of television's position in this organizational setting is still not complete. We need to know what happens when a television screen replaces human interaction on a face-to-face basis. To what extent can a corporation employ television without decreasing the company's sensitivity to people, or can television help increase this sensitivity?

Despite these questions, corporate television is expanding. With the development of inexpensive and compact satellite receiving equipment, the 1980s will see a large company like IBM or AT&T produce a coporate newscast and send it simultaneously into offices and plants throughout the world. The public relations coordinator once trained in print journalism and skilled in editing the company magazine will be producing a video magazine and a television newscast. All of this will necessitate broader perspectives of understanding broadcasting and how it can be used effectively to communicate in a corporate atmosphere. We must not forget that the current generation moving up the corporate ladder is the "television generation." When these younger executives reach top management positions, what decisions will they make about corporate television?

Smaller components and more sophisticated delivery systems also promise to change television. For example, the night watchman of the future will approach a troubled area of the plant with a tiny television camera strapped to his belt, constantly monitoring and videotaping the path before him. Confronting a thief will mean simultaneously taking his picture.

A perspective of the future of corporate television was offered by Will Lewis, vice president of communication at International Paper, a major user of television for corporate communication. Lewis states: "When the contribution of employees is not principally physical strength or physical speed but, in fact, the ability to think and make rational decisions, the Company has an obligation to extend the vision of employees so that they become better informed." Lewis notes that, "as the need for more timely information increases, we must seek new and better ways to provide access to information."[15] Lewis's predictions will be based on more companies realizing the potential for television as a medium for both internal and external corporate communication.

summary

The use of television in business and industry is growing. In fact, it has been predicted that in the 1980s, more companies will be using television than there will be commercial television stations in the United States. Some of these uses currently include producing and disseminating corporate newscasts, developing information programming for employees, training sales personnel, and informing customers. In-service training for new skills is also a function of corporate television. Another is helping managers acquire effective communication skills, deal with employees, and communicate with other managers. Televised surveillance can be used not only for security but also for production control as well. Some companies are trying even to cut costs by using corporate television in their in-house advertising agencies to produce their own commercials.

Producing accountable corporate ITV programming, on the other hand, requires many of the same steps used in producing ITV for education. The future of corporate television will be guided by new television technology and its human implications.

spotlight on further learning

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10

international broadcasting

FOCUS After completing this chapter we should be able to

Compare and contrast broadcasting systems in different parts of the world.

Understand how Canadian broadcasting operates.

Explain how both the government and private sector operate broadcasting in Mexico.

List and explain the two systems of broadcasting in the United Kingdom.

Describe broadcasting on the European continent.

Discuss broadcasting in the USSR.

Explain Japan's broadcasting system and the country's use of new fiber optics technology.

Explain broadcasting in Australia.

Describe broadcasting in Ghana, Rhodesia, and South Africa.

Discuss educational broadcasting in developing nations.

To confine the study of broadcasting today to one country is to have a very narrow view of both the world and the broadcast media. The international flow of broadcast programming, direct broadcast satellites beaming signals across national boundaries, the growing importance of World Administrative Radio Conferences (WARC), and the expanding role of the International Telecommunication Union (ITU), all demand a universal perspective of these electronic media.

We learned in chapter 2 that broadcasting developed simultaneously in many different parts of the world, especially after World War I. Some countries progressed more rapidly than others, with some introducing broadcasting as late as the 1970s. The different political, economic, and social conditions in which broadcasting operates are as varied as the countries themselves. Not every country permits commercial advertising, has a free press, nor allows private ownership of broadcasting. Each country has its own system serving both domestic and international audiences.

This chapter will discuss broadcasting systems around the world so that we can gain a broader perspective of our own system.[1] We will not examine every country, nor will we view each country from the same perspective. What we will do on our world tour is acquaint ourselves with many different elements of international broadcasting.

the scope of international broadcasting

As we visit different countries, remember that the United States is only one model of broadcasting. Our commercial radio and television stations are supported by advertising, and our public broadcasting is supported by government funds, the public, corporations, and institutions. In other countries, advertising also supports some systems of broadcasting, as do public contributions. We also can find systems totally supported by the government. We can find systems for which a special tax is paid on radio and television receivers to help support the system. We can find systems for which the public obtains a license to listen to radio or to watch television, and the license fees support the system. In many countries, different methods of financial support are found side by side.

Also keep in mind that not every country has the freedom of expression found in the United States; some countries are even freer. And the content of radio and television programming, like that in the

United States, is determined by many things, such as the ratings, the government, and advertising. Some countries operate very large systems and some, very small ones. In some parts of the world you might be able to watch television only a few hours per day. In other parts of the world you can watch television beamed in from many different countries. Do not view any country from a narrow perspective. Compare and contrast the different systems and ask yourself questions about the advantages and disadvantages of each.

Canada

Canada's place in the history of international broadcasting is well defined. Marconi ensured that when he selected Newfoundland to test his transatlantic wireless. Those dots and dashes started a chain of events that eventually gave birth to the Canadian Marconi Company. Today, the country is the home of a broadcasting system that stretches from Eskimo villages in the north to the United States in the south. It is a country in which the evening news can be delivered by satellite; yet in which television can be a strange phenomenon to an inhabitant of the northern tundra. Canada also is a country whose fierce pride and loyalty are reflected in everything from its broadcast regulation to its television programming.

Regulatory Framework

Canadian broadcasting is regulated by the Canadian Radio-Television Commission (CRTC) created by the Broadcasting Act of 1968. Comparable to the United States' FCC, the CRTC is composed of fifteen members. Five are full-time, forming the CRTC's Executive Committee, and ten are part-time. The part-time appointees are the key to CRTC's operation. With appointments of up to five years, they are drawn from throughout the country and must be consulted before any major decisions can be made, including issuing, renewing, revoking, or amending the license of a radio, television, or cable company. The full-time members are appointed for seven-year terms and can be reappointed.

Canada's broadcasting policy is stated in the 1968 act:

(a) broadcasting undertakings in Canada make use of radio frequencies that are public property, and such undertakings constitute a single system, herein referred to as the Canadian broadcasting system, comprising public and private elements;

(b) the Canadian broadcasting system should be effectively owned and controlled by Canadians so as to safeguard, enrich and strengthen the cultural, political, social and economic fabric of Canada;

(c) all persons licensed to carry on broadcasting undertakings have a responsibility for programs they broadcast, but the right to freedom of expression and the right of persons to receive programs, subject only to generally applicable statutes and regulations, is unquestioned;

(d) the programming provided by the Canadian broadcasting system should be varied and comprehensive and should provide reasonable balanced opportunity for the expression of differing views on matters of public concern, and the programming provided by each broadcaster should be of high standard, using predominantly Canadian creative and other resources.

The "balanced opportunity for expression" is equivalent in intent to the Fairness Doctrine in the United States. Enforcement is not taken lightly. For example, station CFCF-AM was called to task after broadcasting what the CRTC felt was one-sided coverage of the Official Language Act of the Province of Quebec, with the CRTC charging that the station had "failed to provide adequately in its own programming for a reasoned and responsible discussion of the subject."[2] That prompted the CRTC in 1976 to establish a task force on freedom of broadcast information. Pending any sweeping changes resulting from the task force, the CRTC renewed CFCF's license.

The policy to "safeguard, enrich, and strengthen the cultural, political, social and economic fabric of Canada," is also of great concern to Canadians and has opened up a series of electronic confrontations between the United States and Canada, some involving the State Departments of the two countries. Two examples of these are clamping down not only on American advertising which reaches Canadian audiences but also on Canadian firms buying advertising on American media. When Canada decided to stop permitting Canadian businesses from claiming tax deductions for advertising expenditures on American media, the U.S. National Association of Broadcasters protested vigorously, and even Secretary of State Henry Kissinger became involved. Both Canadian and American cable companies import the other country's signals, and Canada has moved further to delete American commercials from Canadian cable. Although these actions may seem arbitrary, the problems lie in preserving national interests. Nevertheless, Canadians have no control over what American media send into Canada and vice versa, since broadcasting signals simply do not honor national boundaries.

Violent programs imported from the United States are a major worry.[3] Some Canadians have even claimed that American program suppliers dump those violent cartoons on Canada which cannot be aired in the United States. Citing French, Mexican, and Swedish limitations on imported violent programming, some Canadian politicians suggest that Canada should follow the same course. As a start, the American program *Cannon* was struck from the government-owned Canadian Broadcasting Corporation's (CBC) television lineup. Violent television is a popular topic of the politically and socially aware in Canada. Much of the attention has been focused through the Ontario Royal Commission on Violence in the communications industry which amassed approximately 2,500 studies from throughout the world which purport to show a relationship between crime and media violence. Whatever the results of the Canadian debate, violence in the media will remain as important an issue in Canada as it is in the United States.

Programming Systems

Like the United States, Canada has both public and private broadcasting sectors. The private sector has a well-established system of commercial broadcasting stations serving the entire country. The main commercial television network is the CTV Television Network Ltd., which is owned by broadcasters. Inaugurated in 1961, CTV reaches about 95 percent of Canadian television households and transmits over 66 hours of programming per week. One popular program is "A.M. Canada" (Figure 10-1), the early morning information show available in Canada. There also are numerous news documentaries. CTV entertainment fare features such

Figure 10–1 "AM Canada," the Canadian version of America's early morning television programming, broadcasts from 7:00 A.M. until 9:00 A.M. from a Toronto skyscraper. (CTV Television Network Ltd.)

shows as "Stars on Ice," indicative of the popularity of ice skating in Canada and its viewing appetite for everything from hockey to ice ballet.

Comparable in many ways to the U.S. Public Broadcasting Service, the Canadian Broadcasting Corporation (CBC) is the government-owned public broadcasting service. Although reporting to Parliament through a designated cabinet minister, the responsibility for CBC's programs and policies lies with the CBC's own directors and officers. CBC is financed by public funds and by advertising. Several national services are operated by the CBC, including a French-language television network, an English-language television network, and English- and French-language AM radio networks, FM stereo networks broadcast in both English and French, and northern radio services serving the Indian and Inuit peoples. Programs represent a wide range of tastes and can be received by 99 percent of the Canadian population. Typical of the cultural presentations on CBC is the all-Canadian production of "Madame Butterfly," which was seen on the French-language network. Radio Canada International is CBC's overseas service. With headquarters in Montreal, it broadcasts in eleven languages and distributes programs throughout the world.

In addition to the CTV and CBC networks, the Canadian Association of Broadcasters has a program exchange service for its members. Despite its huge land mass, Canada has managed a coordinated policy of broadcast development using the latest technology to reach its diverse population.

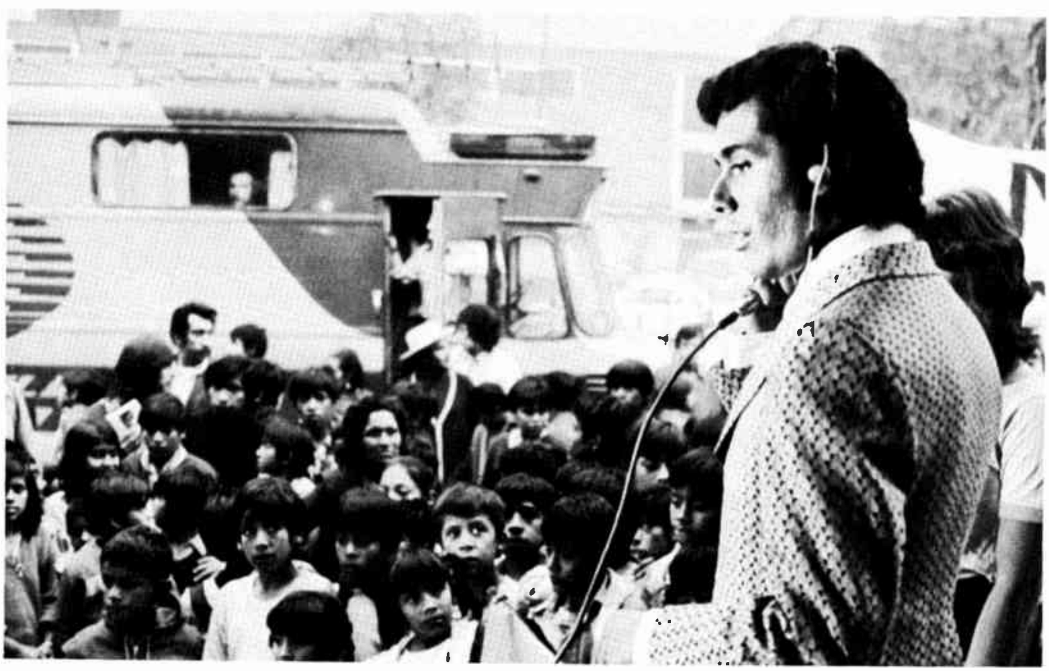
Mexico

The government takes an active part in Mexican broadcasting, including owning and programming its own stations and requiring privately owned stations to provide 12.5 percent of their air time for government use. The government also owns educational television production studios and produces and distributes programs through a nationwide microwave link. Three government agencies participate in Mexican radio and television: the Ministry of Transport and Communications, dealing directly with station regulations; the Ministry of Internal Affairs, which oversees government supported programming; and the Ministry of Education, which coordinates educational programming.

Along with the government stations and government-supported television networks, privately owned radio and television networks crisscross the country. Channels 2, 4, 5, and 8 comprise a federation of four coordinated television channels called Televisa which serves most of Mexico. The channels to some degree represent an attempt to reach more specialized audiences in Mexico. Channel 2's signals, for example, cover most of Mexico with a predominantly middle-class viewing audience. Its programming includes state-produced programs for very young children with a Mexican version of "Sesame Street" entitled "Plaza Sesamo," soap operas, the Mexican version of "Today," weekend sports events, and family entertainment programs. Channel 4 covers metropolitan Mexico City and the immediate surrounding area. Aimed at the mass urban public, programs include specials on Mexico City's neighborhoods and regularly televised block parties (Figure 10-2). Evening programs feature films, amateur hours, and variety artists.

Channels 5 and 8 are geared to the younger, better educated Mexican population. Channel 5's signals reach about half the population of the country via a series of repeater stations which receive and retransmit the signal. Its target audience is the youthful middle class, including university students. Programs on current issues are featured as are American, British, and Japanese programs. Approximately thirty hours of national productions are also seen on Channel 5. Reaching about ten million viewers in the urban valley of Mexico, channel 8 produces many cultural programs. Academic groups and people with differing political beliefs comprise its target audience. Much of Mexico's programming is derived from recognized artists, award-winning international firms, and international productions.

Figure 10–2 A remote broadcast for Mexican television. "Block party" telecasts are a popular format. (TELEVISA, S.A.)



Like Canada, Mexico is very concerned about protecting its national spirit and has excluded what it considers to be offensive programming imported from the United States and other countries.

the United Kingdom

While North America enjoyed the fruits of Marconi's labor, Europe saw the seeds of his communication germinate much earlier. Perhaps nowhere was the new medium's impact felt more than in England where its naval vessels, merchant fleet, Post Office Department, high-powered stations linking continents, and British Marconi Company all used it from its inception. Today, the British Broadcasting Corporation (BBC) and the Independent Broadcasting Authority (IBA) comprise the two systems of broadcasting which have grown out of the wireless.

The British Broadcasting Corporation—BBC

The BBC started in 1922 as the British Broadcasting Company, becoming a corporation in 1927. Today, it acts as an independent broadcasting organization, although it receives its budget for overseas broadcasting from Parliament. The fees it collects from licenses are also determined by Parliament. Directed by a twelve-person board of governors appointed by the Queen, the corporation operates under the advice of a series of advisory boards. These include the General Advisory Council, National Broadcasting Councils for Scotland and Wales, and advisory bodies in such areas as religion, education, and local radio. Originally founded as a nonprofit, public corporation by royal charter in 1927, the BBC does not receive income from advertising.

Radio programming is disseminated throughout the United Kingdom by four domestic radio networks. BBC-1 and BBC-2 are the popular formats with BBC-1 more progressive and BBC-2 attracting a more general audience. Together they capture about 80 percent of Britain's listening audience. They provide news and information, and BBC-2 presents shipping forecasts. BBC-3, on the other hand, programs more classical music as well as dramatic and cultural programs. Live concerts both in Britain and in other countries are emphasized. Masterpieces of world theater and discussions of scientific and philosophical subjects round out BBC-3's programs. BBC-4 is devoted to speeches, news and information programming, dramatic entertainment, and current events. Such programs as "Today," "The World at One," "PM Reports," "The World in Focus," and "The World Tonight" are typical of its extended magazine-type news programs. Phone-in programs, panel games, plays, and readings are heard on BBC-4. Together, these four national networks complement the local radio stations which serve small geographic areas.

Although radio has and continues to be the foundation of the BBC, television does not take a back seat. Experimental television was launched in 1936. Suspended during the Second World War, it went back on the air in 1946. Today, two BBC television networks serve nearly the entire United Kingdom. Over 80 percent of the programs are produced by the BBC, with the remaining 20 percent from independent producers and other countries. Like the domestic radio system, television is financed by license fees collected from owners of receiving sets. Although the licensing fee system brings in income, recent economic difficulties in England have caused serious inflation and some cutbacks in the overall operation of BBC television.

Despite this, the BBC continues to export programming and has received international acclaim for quality. Over 100 countries use BBC productions, and on the average 500 programs are seen per week in various parts of the world. The BBC has a policy of not relinquishing editorial control over any of its programs and does not tailor its programs to any specific region.

Radio is also "exported," not only through direct broadcasting but also through a transcription service that permits selected BBC radio programs to be played back in other countries. At the heart of both transcription and direct broadcasting is the BBC External Service. The BBC receives respect and attention from a global audience. "This is London" uses 39 different languages to broadcast news, information, cultural, and entertainment programming. As the BBC has stated, the External Service transmits values "of a society governed by laws voted democratically, yet willing to listen to dissidents, both within its own frontiers and outside them. It mirrors a national community retooling itself economically and ideologically for the 21st century."[4] Three major services comprise the External Service: the European Service and the World Service (Figure 10-3), which broadcast 24 hours a day in English, and the Overseas Service. Complementing the External Service are BBC radio and television regional services transmitting to Northern Ireland, Scotland, Wales, and the English regions served by television.

Independent Broadcasting Authority

Along with the BBC, the Independent Broadcasting Authority (IBA) operates its Independent Television (ITV) and Independent Local Radio (ILR). A commercial broadcasting system, IBA was created by Parliament in 1954 to broadcast side by side with the BBC. Its sole income is from advertising with commercials airing between programs, not in the middle of them. IBA's structure was amended by the Independent Broadcasting Authority Act of 1973. IBA supervises a developing system of local radio outlets and 15 television production companies which operate much like

Figure 10–3 The BBC World Service. (BBC)

American television stations, serving different regions of the United Kingdom. IBA also monitors the quality of programs carried by its radio and television stations.

The production companies, although supporting themselves by regional advertising, receive their assignments from the IBA, which also operates the transmitters and receives a percentage of the production companies' income as remuneration. Like the BBC, the IBA is free to sell its programs to other countries. At home, it has the authority to assign time to such specific programs as education, news, religious broadcasts, and documentaries. Similarly, the nature and amount of advertising is controlled by the IBA in keeping with the mandate of the 1973 legislation. Other guidelines are provided by the IBA's Code of Advertising Standards and Practice. Television advertising is limited to an average of six minutes an hour, and radio advertising is limited to approximately nine minutes each hour. Like the BBC, the IBA is advised by a group of quasi-citizen-government advisory committees on advertising, medicine, religion, education, local radio, and other operations.

European broadcasting systems

Broadcasting's development and prosperity continue to affect other countries on the European continent.[5]

Scandinavia

In northwest Europe lies the land of the midnight sun—Scandinavia, which includes the countries of Iceland, Sweden, Denmark, Finland, and Norway.

Icelandic broadcasting is controlled by the Icelandic State Broadcasting Service which derives its income from receiver license fees and advertising. Television finally was introduced into the country in 1966. The U.S. Armed Services Radio and Television Service also provides programming for Iceland.

Sweden's broadcasting is under the exclusive control of the Swedish Broadcasting Corporation, Sveriges Radio. Although the government does have ultimate control over the size of the radio and television budget assigned to the corporation, the government does not have control over programming. The Radio Act of 1967 forbids public authorities and agencies to examine programs before they are aired. But the government has indirect control, as it appoints the chairman of the board of governors, the board having final authority over the operation of Sveriges Radio.

There are three radio networks in Sweden, continuing a radio broadcasting service that started in 1925. The second and third networks began service in 1955 and 1962. All three share a variety of programming: Program 1 (P1) airs mostly talk and informational programs; Program 2 (P2) broadcasts classical music; and Program 3 (P3) broadcasts mostly light music interspersed with regional and national news. All are financed by receiver-license fees, as is Swedish television.

Television and overseas broadcasting also come under the jurisdiction of Sveriges Radio, the Swedish Broadcasting Corporation. Introduced in 1957, two television networks currently serve the country—TV1 and TV2. In a somewhat unusual arrangement, the two, even though part of the same system of broadcasting, compete with each other. Overseas broadcasts are conducted by Radio Sweden and reach four continents via short wave transmissions. Programs are broadcast in English, German, French, Spanish, Portuguese, Russian, and Swedish.

The chief regulatory body in Sweden, comparable in some ways to the FCC, is the Swedish Radio Council. Having seven members, the council has the authority to examine programs that already have been broadcast and resolve complaints made by organizations and individuals. At the same time, a group of chief program editors have final authority over all programs and can be held personally responsible for any libel action that might be taken. The editors, not the Swedish Broadcasting Corporation, can be prosecuted for libel.

Denmark's broadcasting system is somewhat similar to Sweden's. Danmarks Radio is a public corporation with receiver-license fees constituting its entire income. Advertising is prohibited. Through a series of transmitters located across the country, the corporation operates three radio program services. Danmarks Radio also has a television service. A radio council with 27 members represents the listeners and viewers. Reporting to the Minister of Cultural Affairs, the council is responsible for carrying out the provisions of the Radio and Television Broadcasting Act of 1973, the most recent major broadcast legislation. The Voice of Denmark has a regularly scheduled overseas broadcast.

Experimental broadcasting began in Finland as early as 1923. In 1926, regular service began with the formation of a public radio company. A year later, legislation placed broadcasting under the Ministry of Communications. Today, all radio and television is controlled by a state monopoly called Yleisradio (YLE). Two networks cover the country's heartland, and a third covers the coastal regions. Broadcasting in Swedish and Finnish, radio is financed entirely by receiver license fees. The External Service broadcasts beyond Finland's borders with programs aimed at three groups: English-language listeners, Finns living in North America, and those at sea.

Finnish television, starting in 1955 at the Technical University, began full-fledged service on January 1, 1958 in a dedication broadcast by then President Urho Kekkonen (Figure 10-4). A second channel was added in 1964. Along with license fees, advertising is permitted on television and is sold by Mainos-TV (MTV), a private company which rents time from the YLE. Founded in 1957, MTV transmits its own programs on both

Figure 10–4 President Urho Kekkonen's New Year's speech on January 1, 1958 initiated YLE's regular TV broadcasts.

television channels. Commercials are transmitted in groups of two to three minutes at the end of and at natural breaks in the programs. The agreement between YLE and MTV has certain restrictions. These restrictions include the prohibition of political programs and the unnecessary use of children in commercials.

In Norway, radio and television is operated by an independent government-owned company, the Norwegian Broadcasting Corporation. Advertising is prohibited and the system is financed by license fees paid by registered listeners. Started in 1923, the broadcasting system of Norway includes a single radio and television network, the programming of which consists largely of educational and cultural fare.

France and West and East Germany

One of the most diversified broadcasting systems is in France. The country has a seven-part broadcasting system ranging from government-controlled to citizen-access channels. There are four independent program societies and three support societies, all formed by the reorganization of French broadcasting in 1974. The seven-part system consists of Télévision Francais 1 (TF1), which has been operating since 1948 and most closely resembles pre-1974 French broadcasting when the Office de Radiodiffusion-Television Francaise (ORTF) operated it. Second is Antenna 2 (A2) created in 1964 and which has a UHF color channel. Third is the French regional radio and television service, France-Regions 3 (FR3), allowing the public considerable access and fostering the widest latitude of public opinion. Fourth is Radio France, under whose auspices all of French broadcasting is organized. The three support societies are the Société Francaise de Production et de Creation Audiovisuelles (SFP), responsible for program production; Télédiffusion de France (TDG), responsible for transmission services; and the Institute Nationale de l'Audiovisuel (INA), responsible for auxiliary services such as research, technical training, and archives. The system is supported mainly by listener fees and, on TF1 and Antenna 2, by advertising.

France's seven-part system still has transition and adjustment problems. Because the change was greatly influenced by French politics, it is only natural that there are varying opinions of the system's effectiveness. Critics generally agree, however, that there is less government control of the system now than before and that there are more opportunities to present diverse programming and political views.

West German broadcasting includes radio, television, and a highly developed cable system. Radio broadcasting is coordinated by the ARD, a federal organization made up of nine members of the *Land* public broadcasting corporations. Two radio organizations, DLF and DW, are operated by the government and do mainly international broadcasting.

The *Land* broadcasting stations all exchange programs. Private commercial broadcasting, Radio Free Europe, Radio Liberty, the United States's Voice of America (VOA), a BBC station, and military stations all are part of broadcasting in Germany. The *Land* corporations also engage in television broadcasting as does the ZDF, which broadcasts both separately and jointly with ARD's *Land* stations. Receiver license fees, government grants, and advertising provide income for broadcasting in West Germany.

East German radio is controlled by the State Broadcasting Committee of the Council of Ministers. Four radio networks are in operation. Television is controlled by the State Television Committee of the Council of Ministers. Broadcast income is obtained from receiver license fees. Interestingly, although East Germany has banned most West German printed media, it cannot ban West German television. Thus, instead of watching East German television, which many consider rather dull, East Germans often watch West German signals, which are easily received across the border.

Switzerland: SBC Short Wave Service

Along with the BBC and other broadcasting systems in international broadcasting, the Swiss Short Wave Service operates an extensive European and overseas service with high-powered transmitters beaming news, information and cultural programs to all continents of the world (Figure 10-5). The Swiss, because of their reputation for neutrality in international affairs, have substantial credibility among many nations, whereas other countries may be perceived as having vested interests in the content of their programming. The Swiss service is well accepted, especially in third-world countries and developing nations.

The Swiss short wave service has two goals—providing timely information to Swiss citizens living in other countries and spreading Swiss culture. Special care is taken in news programming with no report of world significance being broadcast until it is verified by at least two other sources. Entertainment programs are also part of the worldwide service, and recorded programs are mailed to over three hundred stations throughout the world.

Switzerland also operates a domestic broadcasting system. Within this system, Swiss radio is financed by receiver-license fees, and Swiss television is financed by fees, advertising, and government loans.

The Netherlands's Open Door System

The Netherlands's four domestic radio services and two television services stand out as somewhat unique in the world of broadcasting. The radio

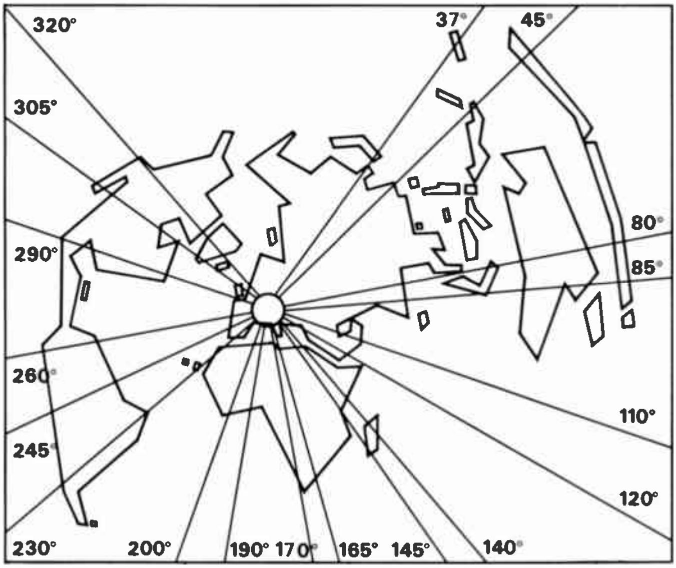


Figure 10–5 Coverage map of the Swiss Short Wave Service.

services—Hilversum 1, 2, 3, and 4—program everything from news to radio drama, with most programs in stereo. The television services, Netherland 1 and 2, broadcast about 80 hours a week, mostly in color and mostly at night. What is unique about these services is that they will give citizens and other organizations air time, if they qualify for it by providing evidence of significant membership and support. Approximately 30 organizations have qualified for broadcasting time on the radio and television services. Some 70 percent of the programming is used by these "qualified" organizations, with the remaining time devoted to jointly produced programs and educational services.

To be granted air time, Dutch citizens must fulfill certain requirements as defined in the Broadcasting Act. An organization must claim at least 40,000 Dutch citizens as members or as supporting the aims of the organization. At this point, the organization is given the status of Candidate Broadcasting Organization by the Ministry of Culture, Recreation, and Social Welfare, the supreme governing body over broadcasting. The candidacy period is used mostly to recruit new members, since the organization's membership must reach 100,000 within two years, or it loses permission to broadcast. There are three categories of qualified organizations—A, B, and C—each permitted different amounts of air time. Which category an organization falls into is determined by the size of its membership. Along with air time comes the right to publish program guides. Despite what may seem like arbitrary controls, the

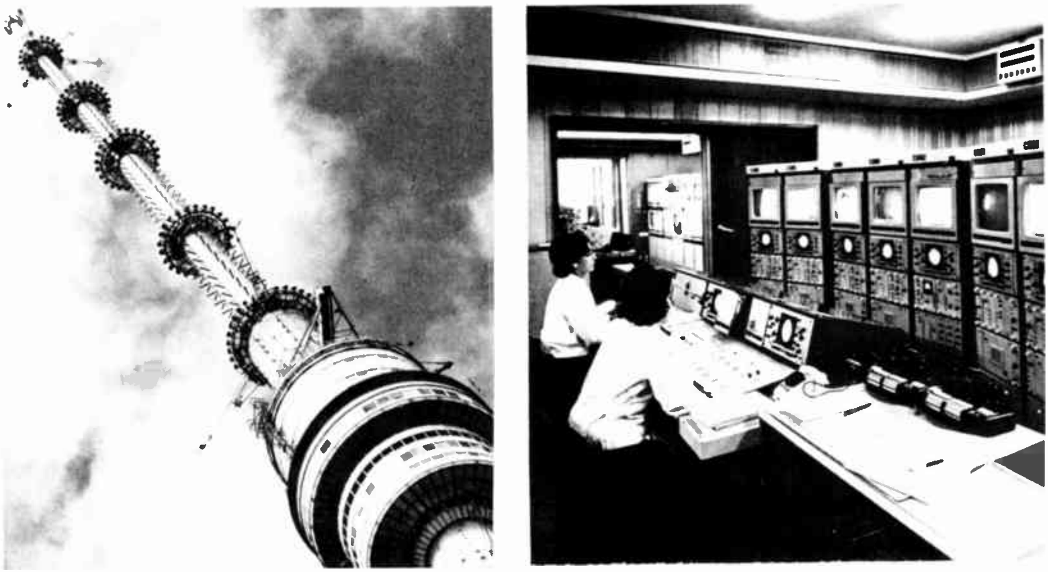
Dutch government cannot censor any of the organization's programming, whose content is determined solely by the qualified organization.

The system is financed both by advertising and receiver license fees. Every Dutch citizen who owns a radio or television must pay an annual fee. Appropriate joint programming is permitted and even encouraged between different organizations. The Netherlands Broadcasting Foundation (NOS) coordinates the activities of the approximately 30 qualified organizations.

USSR

Soviet broadcasting is controlled by the state under the Union Republic State Committee of the USSR Council of Ministers. Income is derived from the state budget and from the sale of programs, announcements, and public concerts. Approximately 60 million television sets are in use or about 98 for every 100 families. The Molina satellites help relay programming to the Pacific coast and Central Asia. Central operations are housed in the Moscow TV Center Tower Building, which is higher than the Empire State Building and has full production facilities for everything from small studio to large auditorium productions (Figure

Figure 10–6 U.S.S.R. Broadcasting complexes. (Courtesy Radio Moscow)



10-6). Color television is seen in many Russian areas using the Soviet-French SECAM system.

The government operates four television networks. Channel I is a network serving all of the Soviet Union. Moscow and its immediate surrounding area are served by Channel II. Channel III is an educational channel, and Channel IV carries drama, music, film and literary programs. Typical programs seen on Soviet television are "Time," a half-hour news program; "The 13 Chairs Tavern," a musical satire; and "Come on Boys," an audience participation show for boxers, wrestlers, weightlifters, and motorcycle racers. Broadcasts are in the 66 different languages of the various Soviet nationalities.

Russian radio broadcasts are heard in 60 different languages and are received by approximately 65 million radio sets. The Home Service of Radio Moscow has four networks. Channel I, like its television counterpart, is heard throughout the country and includes news, commentary, drama, music, and children's programming. News and music are heard on Channel II, with news every half hour. Literary programs and drama are presented on Channel III, and Channel IV concentrates on FM musical broadcasting. FM stereo currently can be heard in 26 major Soviet cities. The USSR also has cable radio. In U.S. dollars, the cost for cable is about 61¢ per month. Cable radio, with three different channels, reaches about 400 Soviet communities.

The USSR's external and overseas service is the responsibility of Radio Moscow. Broadcasting in 64 languages, Radio Moscow programs are mostly on life in the USSR, the Soviet view of international issues, and Russian drama and entertainment. Programs are distributed free of charge to stations in other parts of the world. Weekly programs include "Soviet Press Review," an editorial and commentary program, and "Moscow Meridian," a short commentary. Other biweekly and monthly programs are available on such topics as politics, science, and art.

The Radio and Television Committee also cooperates with other countries wishing to produce programs about Soviet life. One example is "Pravda," a documentary produced by Finnish broadcasters showing the inside workings of the Soviet Union and *Pravda*, a newspaper with one of the world's largest circulations.

Despite its desire to broaden its influence through these broadcasts, the USSR finds television a difficult vehicle through which to spread propaganda. Interestingly, the popularity can do the same to a Soviet propaganda broadcast that poor ratings can do to American television. A dull show is simply not watched, neither in America nor in the Soviet Union. Since there is more than one channel to choose from, a Soviet audience will more than likely choose sports or entertainment over political broadcasts. In fact, if given the choice of watching political broadcasts or not watching, many times they will choose not to watch.[6]

Australia

Both a private-commercial and a government-sponsored system of broadcasting operate side by side in Australia.

Radio Services

The system, from radio's perspective, is a competitive battle for audience listenership. The Australian Broadcasting Commission operates the government radio system, called the National System. Responsible to Parliament, the A. B. C. controls fifty transmitters scattered throughout the continent and is programmed by two major networks. License fees help finance the government system with one network servicing local and regional areas and the other crossing state boundaries as a country-wide system. Government subsidies supplement the license fees. Programming has emphasized cultural entertainment and classical music presentations. Specially held concerts by world-recognized musicians have been a popular broadcast feature on A.B.C. stations. Since the concerts are often held in large Australian cities, an admission charge helps defray the cost of the concerts.

There is also a comprehensive commercial broadcasting system with more limited service areas but with the ability to sell advertising, which also covers the Commonwealth. Commercial stations, partly because they must depend on local advertisers, orient their programming to their own locales. As in the United States, commercial stations compete directly with each other as well as with the government stations. A voluntary code of ethics helps control the content of Australian broadcasting and acts as a buffer to increased government control, similar to the NAB Code in the United States. Australia also has public stations, similar to those in the United States, which are supported by subscription, universities, and organizations.

Radio Australia

Overseas broadcasting is the responsibility of Radio Australia. With 24-hour service concentrating on news and information interspersed with some music and entertainment programs, Radio Australia broadcasts in eight languages and some dialects. Current language breakdowns include approximately 54 percent English, 17 percent Indonesian, 7 percent Chinese, 7 percent French, 4 percent Vietnamese, 4 percent Japanese, 2 percent Thai, and 6 percent simple English and Neo-Melanesian.[7] The fate of Chinese refugees has been an important part of its Chinese broadcasts. Reports to relatives, messages from students studying in

Australia, and songs and interviews with children of Chinese refugees are typical broadcast fare.

Television

As with radio, there are two systems of television in Australia: the government-supported system and the private-commercial system. More than 50 government stations are in operation compared to just under 50 commercial stations. Government stations come under the A.B.C's jurisdiction, and commercial stations are part of the Federation of Commercial Television Stations (FACTS). Drama, public interest programs, and sports make up the majority of government television programs. About 60 percent of the government programs are produced by the A.B.C., 12 percent by the BBC, 7 percent by other United Kingdom and Commonwealth countries, and 21 percent by the United States and other overseas countries. The most popular programs on commercial television include "Number 96," an adult serial drama; news and weather; drama; "Disneyland"; and "Matlock Police," a police drama series.

Japan

With so much attention focused on Japanese imports of television sets and related electronic gear, we tend to think of broadcasting in Japan in such terms as SONY and Panasonic. However, beyond the manufacturers is a broadcasting system geared to new technology.

The Wired City: Optical Visual Information System

Japan has been one of the world leaders in making practical application of fiber optics. Indicative of this is the experimental prototype system for Higashi Ikoma New Town, selected for its location and population base. The system contains a central computer terminal with fiber optics transmission lines permitting not only television signals, but also computer processing and all of its related services to be available on a residential basis. Although experimental uses will vary, the system will enable shopping, banking, and other purchasing decisions to be made from the living room. Television program guides, newspaper delivery, and still-picture transmission are just a few of the many uses.

This experimental fiber optics system has nine components:[8] (1) a *computer* which will automatically select programs and other services in response to home terminal commands; (2) a *subcenter system* which supplies the programs and information to the home terminals; (3) a *TV request* *system* which provides motion pictures to home screens through videocassette tape recorders; (4) a *still-picture system* for such activities as shopping and news; (5) a *studio system* permitting full-scale production at the center; (6) a *retransmission system* for standard cable television transmission; (7) a *mobile center* for live coverage outside the studio; (8) an *optical transmission and reception system* which converts electrical signals to light signals compatible with fiber optics transmission; and (9) *home terminals* which permit viewers to control the system. The home terminal system also includes a camera and microphone for *two-way audio and visual* communication (Figure 10-7).

Using fiber optics, the amount of information that the system can carry becomes almost infinite. For the Japanese, they view such a system as increasing, not decreasing, personal communication between individuals that high technology often discourages.

Nippon Hōsō Kyōkai (NHK)

Correspondent, critic, and network executive Sander Vanocur has called Japan's governmental television service, NHK, the best he has ever seen and ranks it above the BBC. To many Japanese, NHK means television. Financed by license fees, the system provides a blend of information and both Japanese and western cultural programming (Figure 10-8). Oper-

Figure 10–7 Prototype of the Japanese cable system employing two-way audio as well as video communication.

Figure 10–8 A scene from the NHK program "Kashin" (God of Flower), a serial drama airing on Sunday evening. (NHK)

ating two channels, one for education and the other for information and entertainment, NHK television reaches every corner of the country. It also operates three radio networks (Figure 10-9).

Along with the domestic service, NHK's Radio Japan broadcasts worldwide in 21 different languages. The Regional Service of NHK is designed for specific areas, and the General Service airs worldwide. NHK's posture in domestic and international broadcasting is best described in the 1950 Broadcast Law:

(1) To broadcast well-balanced, high-quality programs in the fields of news reporting, education, culture, and entertainment in order to meet the various needs of the people;

(2) To undertake construction of broadcasting stations even in remote mountainous areas and isolated islands to bring broadcasting to every corner of the country;

(3) To conduct research and investigation necessary for the progress and development of broadcasting, and to make public the results thereof;

(4) To foster correct understanding of Japan by introducing this country's culture, industries, and other aspects through the overseas broadcasting service; also, to provide international cooperation, such as program exchange and technical aid, for overseas broadcasting organizations.

Figure 10–9 Transmission control room at the NHK Broadcasting Center. (NHK)

Commercial Service

With the end of World War II, the democratization of Japan, and the introduction of television technology, the important 1950 Broadcast Law recognized private commercial broadcasting as a competitor of NHK. Together, NHK and commercial companies operate over 6,000 radio and television stations covering even Japan's mountainous terrain. The public has a wide choice of programming. Tokyo, for example, has the two television services of NHK, five commercial television stations, four commercial radio stations, and three NHK radio networks.[9] There are approximately 50 commercial companies in radio and 85 in television programming. With Japan's interest in high technology and a well supported government broadcasting system competing with a commercial system, the future for broadcasting in this nation is particularly bright.

Africa

The wide ranges of technology, the varied cultures, the great expanse of land, and the political and economic issues of the time all blend together to make Africa a fascinating place from which to view international broadcasting. Within the continent, we can both find the most modern facilities in the world and the first introduction of a primitive tribe to the "voice in the box."

Ghana

Called the Gold Coast when broadcasting was first introduced, Ghana's association with radio goes back to 1935.[10] Introduced to the country by Governor Sir Arnold Hudson, radio at that time had only about 1,000 listeners. Station ZOY began in a bungalow as a "wired-relay station" and then, bolstered by government funds, moved into Broadcasting House in Accra in 1939. Eight technician-announcers manned the station in pre-World War II days, then it increased its staff and expanded its facilities to other regions before the war actually started. ZOY served as a news and information source during the war, and signals were retransmitted via sixteen relay stations. In 1952, a government-appointed commission of broadcasters and academicians reviewed broadcasting and upon the commission's recommendations, the Gold Coast Broadcasting System was formed in 1954. When independence was gained three years later, the name was changed to the Ghana Broadcasting Corporation (GBC).

Today, the GBC operates two services, National and External. Two networks operate out of the National Service, GBC-1 and GBC-2. The External Service is described by the GBC as "a true voice of Africa helping us forward in the fight for emancipation, helping us struggle for total emancipation and political Union of African States, a voice raised forever in the cause of peace and understanding between men and between nations of the world."[11]

Television in Ghana dates back to 1959 when a Ghana-Canada Technical Assistance Program promoted the installation of facilities of the Accra Broadcasting House. Service began in 1965, mainly to provide Ghana with an understanding of domestic and world affairs. Drama presentations have been especially popular with illiterate segments of the population. Overall, the viewing audience is estimated at 660,000 out of a population of approximately 8.5 million.

Ghana participates in a broadcasting exchange program with other African states. Its broadcasting systems are financed by government subsidies, advertising, and subscriptions to the broadcast relay service, which extends the availability of radio and television to outlying areas.

Rhodesia

The exact structure and organization of Rhodesian broadcasting is somewhat uncertain, depending on the changes that may occur with black majority rule. But through 1978, broadcasting remained under control of the Rhodesian Broadcasting Corporation.[12] Three Post Office Department engineers began public broadcasting back in 1941 with a converted transmitter originally used for aircraft guidance. For years, the Federal Broadcasting Corporation (FBC) in Rhodesia operated radio broadcasting. Television, meanwhile, was produced by R.T.V. Ltd., a production company affiliated with the FBC, in much the same way production companies produce the programs under the jurisdiction of the Independent Broadcasting Authority in the United Kingdom. R.T.V. Ltd. was owned by a consortium, including the local newspaper which owned 51 percent of the stock. The remaining 49 percent was held by the FBC which had the authority to prohibit any change in stock ownership. After the country became independent in 1964, the Rhodesian government changed this shareholding arrangement. The Rhodesian Broadcasting Corporation now owns 51 percent of the stock with the remaining 49 percent owned by the public and listed on the stock exchange.

In 1976, the television services were changed from their status as production companies to an actual part of the RBC. Under this system, about 20 to 30 percent of RBC's programming is locally produced with the remainder being imported from such sources in the United States.

Rhodesian independence has been a time of tension and strife for not only the country but for broadcasting as well. Previously contributing news and entertainment programming to the FBC, the BCC has cut all ties with the RBC. The loss was a severe blow, and the new RBC had to scramble to plug the holes left by the vacant programs. The transition was roughest for the African Service broadcasting to Black Rhodesia. Loyalists threatened the studies and harassed the personnel. Special escape routes even were devised to transport the staff in and out of the broadcasting buildings without incident.

Today, the African Service continues to exist and is responsible for educating and maintaining the culture of Rhodesia's African tradition. Although modernization of the entertainment programming is evident, the sounds of a tribal drummer and tales of cultural heritage are still a part of African Service radio programming.

Republic of South Africa

Among those countries involved in international broadcasting, the Republic of South Africa contains a fully developed broadcasting system. Controlled by the South African Broadcasting Corporation (SABC), the country currently has both radio and color television services which are programmed in two languages for the white population and in seven

African languages for the Bantu peoples. The South African Railways launched the very first broadcast transmissions in July 1924, signaling the beginning of three separate broadcasting services. Three years later in 1927, the three services were consolidated into the African Broadcasting Company (ABC).

Financial problems continued to beset the consolidated service, and the ABC limped along until 1936 when legislation responding to a study group's recommendations formed the SABC. There was equal parity in the control of the SABC until World War II when the English-speaking, British descendants and the Afrikaans-speaking Dutch descendants, once known as the Boers, split along political and philosophical lines. The Afrikaners had been a rural minority with very little representation in early broadcasting, save for an-hour-per-week service from the heavily British ABC. Resentment continued until the legislation creating the SABC called for an equal number of programs in both English and Afrikaans. However, equal numbers did not always mean equal political content, and the Afrikaners began to complain about the political bias of programs, about being forced to report statements of the ruling English, and about the required loyality oath to the SABC.

World War II brought two important changes. First, it sent abroad many of the English-speaking staff of the SABC volunteering to fight for the Allied cause, leaving behind a majority of Afrikaners. Second, the Afrikaner Nationalist party won the 1948 elections and was in a position to regain a strong voice in the affairs of the SABC. Today, the black-white struggle is publicized more from the white standpoint and is influenced heavily by the political philosophy of those earlier struggles between the English and Afrikaners.

The SABC retains control of South Africa's broadcasting, although private radio has represented both white factions. With headquarters in new broadcasting facilities in Johannesburg, SABC has one of the most lavish broadcasting complexes in the world (Figure 10-10). A huge office complex and production facilities overlook a giant broadcasting tower nearby, which houses the antennas of the SABC services. Radio is heard throughout the country by the English service, the Afrikaans service, regional commercial services, Radio Bantu, and the Voice of South Africa which is beamed to 23 different areas of the world.

Because of the mountainous terrain and sparse population, television arrived late in South Africa. Approved by the government in 1971, a one-channel service devoting equal time to broadcasting in both English and Afrikaans, began in 1976. Four mobile units in Cape Town, Durban, and two in Johannesburg provide supplementary programs. Television service to the Bantu people is already planned and expected to be operational in a couple of years.

Figure 10–10 Headquarters of the South African Broadcasting Corporation. The tall building is the administration building and the tower in the background houses the transmitter facilities.

educational broadcasting in developing nations

Many developing nations are reassessing the importance of education to their systematic growth. To understand a common language, participate in political processes, and provide local government leadership all require a literate populace. For most countries, however, this renewed emphasis on education has been a painful and deliberate process. Many nations lack the funds to train a national teacher corps. Others find it difficult to find qualified personnel who will both be sensitive to cultural heritage and acceptable to local communities. As a result, these nations have turned to the media for help, often using foreign-aid dollars to defray the cost.

To understand how broadcasting has helped the educational growth of these developing nations, we first shall examine radio. Emile G. McAnany has categorized radio's role into five strategies of use.[14]

Five Strategies for Using Radio

McAnany's first strategy is open broadcasting: the unorganized audience. This category describes the broadcasts to the general population. For example, natives in African Zaire hear the voice of "Dr. Massikita" bringing them information on feeding newborn children or on nutrition. Other African countries have instituted similar health and agricultural programs which are usually repeated in different languages. Latin American programming strategies also follow this broadcasting pattern.

A second strategy is that of instructional radio: the organized learning group. Here radio is used as a substitute teacher. Australian children often receive these broadcast lessons in remote rural settings, far from a traditional classroom. In Tanzania, instructional radio teaches basic skills by correspondence. Around the globe in Thailand, radio beams music, social studies, and English courses to the populace. In Sudan, instructional radio teaches Arabic, tribal history, and etiquette.

A third strategy is radio rural-forums: the decision group. These programs offer information on rural news, answers to listeners' questions, or a discussion or lecture topic. Many listeners get together in groups, listen to the broadcasts, then a discussion leader guides them through a dialogue on the subject. Countries using this approach, among others, are Ghana and India. McAnany illustrates this strategy using Benin, a small country in western Africa. There, ten to thirty villagers gather to listen and discuss the programs, which are broadcast in ten native languages at different times during the week. A group discussion leader called an *animateur* is chosen from the village to lead the dialogue. This person then sends a monthly report back to the production center, which may be used as feedback in producing future programs. A second person called an *encadreur* serves as a technical resource person for the village. The *encadreur* provides guidance for any projects which result from the discussions.

Another strategy is radio schools: the nonformal learning group. This audience is mostly illiterate, rural adults, so the programming is basic training in reading, writing and "some figuring." Nations often use multimedia approaches in this strategy combining radio, newspapers, film strips, booklets, and charts.

McAnany's fifth strategy is radio animation: the participating group.

Although at first participation may seem like rural forums or radio schools, it is not. Radio's chief contribution here is to define and identify community problems rather than to provide solutions. Discussion leaders then promote dialogue among community members to solve these local problems.

The future of educational radio in developing nations is brighter than that of educational television. A television receiver in some ways can be more intrusive than a radio receiver, especially in areas unaccustomed to new technology. Moreover, many mountainous areas can not receive television signals, and radio is the only alternative. Radio also lets local discussion leaders maintain their identity, unchallenged by a visual commentator.

Applications of ITV

Television also is influencing major educational reforms. Wilbur Schramm has documented one example in the small, Latin American country of El Salvador.[15] ITV was introduced into El Salvador on a pilot basis in 1967.

The government selected work in the seventh, eighth, and ninth grades as the major test curricula. El Salvador's schools at that time were faced with a serious attrition rate and inadequately trained secondary school teachers. Schramm's report noted that although scheduling problems and a teachers' strike did cause some difficulties, the ITV pilot program did show positive results. He also observed "tentative evidence" that classes using ITV contributed to greater equalization of learning gains.[16] At the same time, however, Schramm noted that ITV was but one portion of the educational reform in El Salvador, although it was the most publicized. Other reforms were extensive teacher training and curriculum revision.

El Salvador's students seemed to like television in the classrooms as did teachers and parents.[17] Teachers did, however, recognize the medium's limitations, such as the inability of students to "ask" television questions. In fact, after the first year of the evaluation program, the initially positive reaction to ITV diminished. Schramm's report contributed this waning popularity partially to a "spillover effect" of general dissatisfaction resulting from the teachers' strike. Parents were receptive to ITV especially after having it explained to them. Although less expensive than placing teachers in the classroom, the future of ITV in El Salvador will be linked to its cost-effectiveness. Can ITV replace teachers in some areas? If it can, will the educational results harm or help the students? The answers are crucial both to El Salvador and to ITV.

Another example of educational broadcasting at work in educational reform is in American Samoa. Here, the government introduced television into the classroom in 1964 as a way of rapidly trying to upgrade the educational system and teach English to elementary school students. Samoa's governor, H. Rex Lee, even proposed a television network to teach some basic material in elementary classes.[18] As in El Salvador, ITV programs are used as a supplement to teachers, not as replacements. The format of each lesson has four phases: preparation, television lesson, follow-up and feedback.[19] The advantages of the format are uniform content and, through the lesson plan, as much control as possible over the discussions that precede and follow the broadcast.

Despite the widespread use of ETV and strict controls over the use of the programs, English proficiency in Samoa is still not up to U.S. mainland levels. One analysis blames it on the lack of sensitivity to the local culture.[20] Although English is important, Samoan culture, the analysis states, is more important. A group from the United Nations Educational, Scientific, and Cultural Organization (UNESCO) commented that in one of the broadcasts "the stateside teacher used a Samoan adult as a prop, asking him to touch his nose, go to the door, and so on. All of the talking was done by the stateside teacher. This may have implied an ethnic superior-subordinate relationship."[21] Efforts are still made to bridge the cultural gap. Stories are written in English using native names for the characters, and mathematical concepts are taught using such objects as shells, stones, and leaves.

ETV in Samoa, although widely used, illustrates the problems of intercultural communication which can develop whenever new technology and "foreign" teachers, even used only as advisors, are sent to help a developing nation improve its educational processes. A country's internal characteristics, such as those of Malaysia where two different native languages are spoken, can also create problems.[22]

As in El Salvador and Samoa, Malaysia uses television as a supplement to classroom instruction. Again, acceptance of it was slow. The country's British instructional system emphasizes rote learning and examinations; the people felt more comfortable with lecture recitation than with television. But these problems are slowly being resolved by training local educational leaders who, in turn, are introducing television to others. In 1973, UNESCO sponsored a crash program to train nine school officials to conduct workshops for 5,000 primary school teachers. This was supplemented by a computer-assisted evaluation system which analyzed the effects of teacher feedback on the new programming.

The future of educational broadcasting in developing nations will depend on how successfully cultural barriers are bridged and how well instructional broadcasting can represent and blend into local culture.

Although our world tour has stopped at only a limited number of countries, we have been able to sample some of the different broadcasting systems and the many issues common to other parts of the world. New technology will undoubtedly bring us all closer together, and it remains to be seen how much influence different countries will have on each other's communication systems. Even though countries are interested in adopting the technology of different parts of the world, each wants to retain its own system of broadcast control and cultural integrity of programming.

summary

In our tour of world broadcasting systems, we stopped first in Canada where broadcasting is controlled by the CRTC, with jurisdiction over both public and private broadcasting. The Mexican government is active in broadcasting in that country where it owns and operates its own stations and requires other stations to provide certain amounts of program time for government use. In the United Kingdom, there are two systems of broadcasting: the BBC and the IBA. A series of advisory committees also influences the British system of broadcasting.

On the European continent, the Scandanavian countries have somewhat similar broadcasting systems. Broadcasting in France is controlled by a quasi-government organization. West Germany has radio, television, and a highly developed cable system. Many West German programs are also popular in East Germany where broadcasting is controlled by the government. Switzerland, while providing domestic radio and television, also provides short-wave broadcasts popular in many parts of the world because of Switzerland's neutral political stands. In the Netherlands, any organization which can show support of a large following of people within the country can obtain air time. Soviet broadcasting is a government-controlled system which distributes programs free of charge to many other parts of the world.

In Australia, much as in Britain, both government and private broadcasting stations compete for the broadcast audience. In Japan, NHK is looked upon as one of the world's most highly regarded broadcasting systems. We also examined broadcasting in Ghana, Rhodesia and the Republic of South Africa. Broadcasting has found especially valuable applications in developing nations to continuing education as well as to direct in-school learning.

spotlight on further learning

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part

4

Regulatory Control

11

early attempts at government control

FOCUS After completing this chapter we should be able to

Explain the provisions of the Wireless Ship Act of 1910.
Explain the provisions of the Radio Act of 1912.
Discuss the National Radio Conferences.
Trace the collapse of the 1912 legislation.
Explain the provisions of the Radio Act of 1927.
Describe what led to the passage of the Communications Act of 1934.

By the second decade of the twentieth century, the British Marconi Company had a well developed, worldwide corporate empire. Ships were comfortable with wireless and had demonstrated its effectiveness in numerous cruises. Experimental radio stations were popping up everywhere, and ham radio operators were toying with a hobby which would soon become a major social influence. As we learned in chapter 3, in the 1920s some of the historical giants of broadcasting took to the air—WHA at the University of Wisconsin, KDKA in Pittsburgh, WBZ in Springfield/Boston, Chicago's WGN, and WWJ in Detroit. The public was being entertained with Big-Ten football, live orchestras, election night fervor, and presidential speeches. They also were being harassed by higher powered stations, jumbled interference, and rampant competition. There simply was not enough room on the electromagnetic spectrum for everyone to jump on without someone being pushed off.

The government first became concerned about radio's impact when Marconi started prohibiting ships and shore stations from communicating with each other unless they were equipped with Marconi equipment. The idea may seem incredible by today's standards, but Marconi managed to get away with this for some time. Germany was especially affected by Marconi's antics since it housed the competing Slaby-Arco system. The Germans finally took the initiative and called a conference in Berlin in 1903, at which a protocol agreement was reached on international cooperation in wireless communication. Three years later, Berlin hosted the first International Radiotelegraph Convention, from which an agreement was signed by twenty-seven nations. In the United States, the stage was now set for domestic legislation which would embody the spirit of the Berlin agreement and foster safety and cooperation among American shipping interests. It is this 1910 legislation that we'll study as part of the development of government involvement in broadcasting.

the Wireless Ship Act of 1910

In 1910 there were few visions of commercial broadcasting stations as we know them today. Transatlantic experiments were less than a decade old, and Congress was thinking only now about safety applications of the new medium, especially to ships at sea. Some ships, although by no means all, had installed wireless apparatus (Figure 11–1). It was in this atmosphere

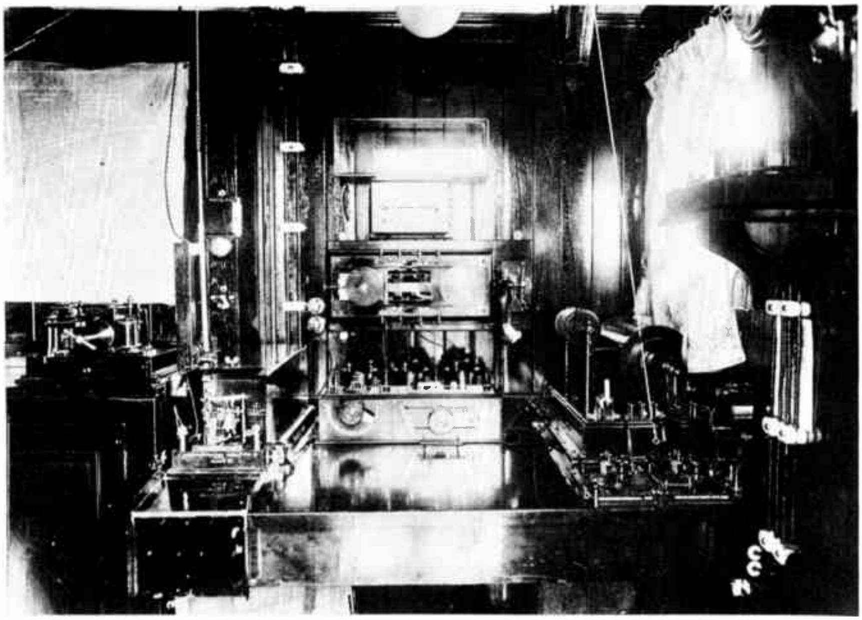

Figure 11–1 Early wireless found immediate application in ship-to-shore communication. Typical of the elaborate Marconi-equipped facilities was this wireless room aboard the *Lusitania*. (The Marconi Company Limited, Marconi House, Chelmsford, Essex)

that the Wireless Ship Act of 1910 was passed.[1] Containing only four paragraphs, it set the stage for maritime communication. Among other provisions, the act made it illegal for a ship carrying more than 50 people not to be equipped with radio communication. The equipment had to be in good working order and under the direction of a skilled operator. The range of the radio had to be at least 100 miles, day or night. Exempted from the provisions were steamers traveling between ports less than 200 miles apart.

The act also specified that the "master of the vessel" should see that the apparatus could communicate with both shore stations and other ships. Violations meant a $5,000 fine, and a vessel could be fined for every infraction of the law and cited in the district court with jurisdiction over the port where the ship arrived or departed. Enforcement of the law was spelled out: "That the Secretary of Commerce and Labor shall make such regulations as may be necessary to secure the proper execution of this Act by collectors of customs and other officers of government."

the Radio Act of 1912

By 1912, wireless had achieved international recognition and cooperation. Yet the United States had been lax in these agreements, partially because wireless was not under total government control as it was in some other countries. That all changed on an April night in 1912 when an iceberg took the American ship *Titanic* to the bottom of the North Atlantic. The following days and months were filled with news of the sinking and the role of wireless in the event. Reports centered on everything from the way in which wireless shipboard operators might have prevented the sinking to the brilliant performance of the medium in relaying news of survivors. Ironically, four months before the tragedy, the provisions of the 1906 Berlin treaty had been taken out of congressional mothballs for discussion in Senate committees. Those discussions, hastened by the sinking of the *Titanic*, led to the August passage of the Radio Act of 1912.

The 1912 act was much more comprehensive than the 1910 legislation. It defined authority between federal and state governments and established call letters for government stations. The law read: " . . . but nothing in this Act shall be construed to apply to the transmission and exchange of radiograms or signals between points situated in the same State. . . ." Along with providing clauses for revocation of licenses and fines for violators, it also established the assignment of frequencies, stating the license of the station would "state the wave length or the wave lengths authorized for use by the station for the prevention of interference and the hours for which the station is licensed to work. . . ." In addition to these specified wave lengths, stations could still use "other sending wave lengths." Licenses were to be granted by the Secretary of Commerce "upon application thereof." The president of the United States was given the power to control stations during wartime with compensation to the station's owners. The 1912 act also established the famous SOS distress signal allowing it to be broadcast with a maximum of interference "and 9" maximum of radiation. It was required to reach at least 100 miles. For the first time, the act defined *radio communication* as, "any system of electrical communication by telegraphy or telephony without the aid of any wire connecting the points from and at which the radiograms, signals, or other communications are sent or received." Other provisions of the act covered secrecy-of-messages restrictions to protect government stations' signals, rules for ship-to-shore communication, and a ban on stations refusing to receive messages from those not equipped with apparatus manufactured by a certain company.[2]

Despite its particular reaction to the sinking of the *Titanic*, the 1912 act was a valiant effort to control wireless communication. But few legislators could have foreseen the huge popularity of wireless, and even if they could have, legislative processes could not have begun to keep up with the new technology. It was not long before the regulatory framework began to crumble.

The National Radio Conferences: The 1912 Law in Trouble

By the mid-teens, both the United States and radio were in World War I. For the U.S. Navy, it meant hurriedly constructed wireless towers on board warships (Figure 11–2). Having taken over the country's radio stations, the government stopped all radio development except for wartime service. But when the war ended it was like uncapping a bottle. All the pent-up enthusiasm was released, and new experimenters eagerly flocked to their equipment. Although the Radio Act of 1912 had survived the World War, it was headed for rough sailing in a radio industry exploding with popularity and technology. By the 1920s, the chaos had mushroomed out of proportion. In 1922 alone, receiving-set sales had climbed 1,200 percent. The airwaves were flooded with everything from marine-military operations to thousands of amateur radio experimenters. Added to this was the advent of commercial radio and its powerful stations booming onto the air.

Figure 11–2 Ships using early wireless equipment had large masts constructed to support antenna wires. (Department of the Navy and *Sea Power*)

On February 27, 1922, groups of government officials, amateur radio operators, and commercial radio representatives met for the First National Radio Conference in Washington, D.C.[3] The conference was addressed by representatives of all opposing factions. Amateur radio operators were afraid their privileges were going to be curtailed under the influence of such large commercial firms as General Electric and Westinghouse. The large commercial firms were afraid their privileges were going to be relegated to the military. After the rhetoric subsided, the conference split into three committees: amateur, technical, and legislative. Since interference was still the biggest problem, it was not surprising that the technical committee's recommendations received the most attention. Based on that report, legislation was introduced in Congress in 1923 but never emerged from a Senate committee.

The second conference began on March 20, 1923. This one reaffirmed the problems of interference and recommended discretion in frequency allocations. Taking into account the commercial interests of the new medium, the conference suggested that allowing more stations on the air would only aggravate an already shaky financial condition. By today's standards of competition among almost 8,000 stations, the proposal seems inappropriate. Realizing that different geographical areas had different problems, the second conference suggested splitting up the country into zones, with each tackling its own problems locally. As he had after the first conference, Congressman Wallace White of Maine introduced legislation which again did not budge from the congressional committee.

The deafening interference continued straight into the convening of the Third National Radio Conference on October 6, 1924. Two major developments captured the attention of these delegates. Network broadcasting had become a reality. AT&T's wire system and Westinghouse's short-wave system were proving interstation connection was not only possible but also might be successful. Almost simultaneously, David Sarnoff announced RCA was going to experiment with the concept of super-power ~~stations crisscrossing~~ the country. It is little wonder that the third conference recommended resolutions opposing monopoly and even encouraged government intervention. Nevertheless, the conference supported the development of network broadcasting but, although agreeing to let the super-power experiments proceed, warned that they "should only be permitted under strict government scrutiny."[4] On the request of Secretary of Commerce Herbert Hoover (Figure 11–3), Congressman White refrained from introducing legislation. A third defeat would have been bad politically, and the decision was made to wait until still another conference was called.

Convening on November 11, 1925, the Fourth National Radio Conference ended with proposals which later became the foundation of the

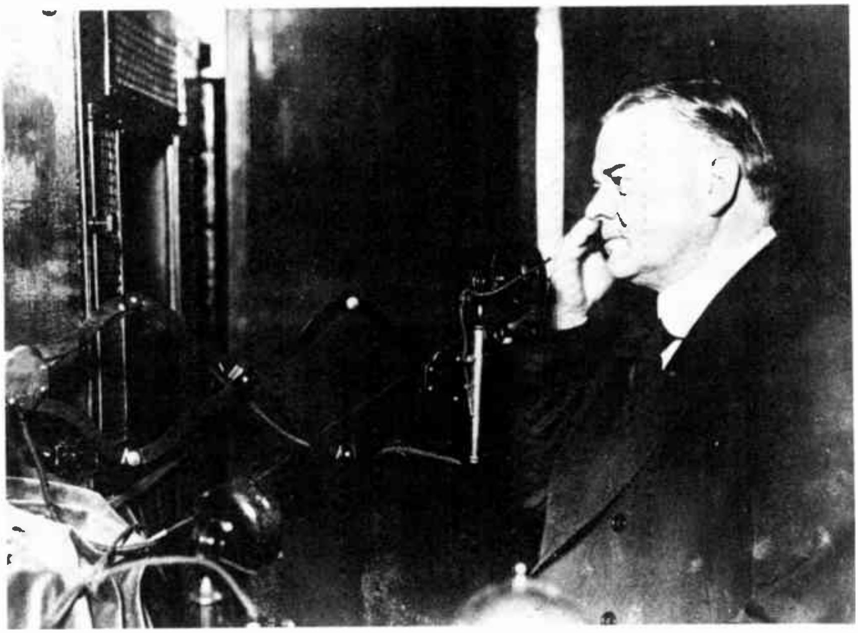

Figure 11–3 Herbert Hoover appearing in a 1927 experimental television demonstration. (AT & T Co.)

Radio Act of 1927. This conference suggested a system of station classifications and admonished Congress to pass some workable broadcasting legislation. The delegates recommended preventing monopoly, installing five-year terms for licenses, requiring stations to operate in the public interest, providing for licenses to be revoked, and giving the secretary of commerce the power to enforce regulations. They also wanted to guard against government censorship of programming, provide for due process of law, give the president control of stations in wartime, and suggest that broadcasting not be considered a public utility. But the good intentions were too late.

Judicial Setbacks for the Radio Act of 1912

Despite the radio conferences' valiant efforts to make it workable, two law suits and an opinion from the United States Attorney General made it clear that the 1912 law was in serious trouble. Highlighting the problem in 1923 was *Hoover* v. *Intercity Radio Co., Inc.* Intercity had been engaged in telegraph communication between New York and other points under a license issued by the secretary of commerce and labor. Upon expiration, Intercity applied for and was denied a renewal because there was not space available on the spectrum for a frequency assignment that would not interfere with government and private stations.

The issue went to court, and the judges ruled that the secretary had overstepped his bounds in refusing to renew Intercity's license. Cited as justification was a statement made by the chairman of the committee on commerce when the bill was passed, that: "it is compulsory with the Secretary of Commerce and Labor that upon application, these licenses shall be issued." The interpretation meant that the secretary of commerce and labor, although having the power to place restrictions on licenses and to prevent interference, could not refuse to issue a license as a means of reducing that interference. The court stated: "In the present case, the duty of naming a wavelength is mandatory upon the Secretary. The only discretionary act is in selecting a wavelength within the limitations prescribed in the statute, which, in his judgment, will result in the least possible interference." The court went on to define the relationship between the restrictions and license, stating: "The issuing of a license is not dependent upon the fixing of a wavelength. It is a restriction entering into the license. The wavelength named by the Secretary merely measures the extent of the privilege granted to the licensee."[5]

For the secretary of commerce and labor, the ruling was extremely frustrating. Broadcasting had progressed beyond the experimental and military stages. The secretary was faced with regulating a limited resource, and the court was telling him that he had to give some to everyone who wanted it. The act had given the secretary broad responsibilities, but the provisions of the act did not give him the power to implement them.

This was only the first of the secretary's setbacks. Three years later came the case of the *United States* v. *Zenith Radio Corporation et al.* Zenith had received a license authorizing it to operate on a "wavelength of 332.4 meters on Thursday night from 10 to 12 P.M. when the use of this period is not desired by the General Electric Company's Denver station." Zenith clashed with the secretary when it operated at other times and on another, unauthorized frequency. Yet the court ruled in favor of Zenith. The legal catch was a section of the 1912 law reading: "In addition to the normal sending wavelength, all stations may use other sending wavelengths. . . ."[6]

The crowning blow came when Acting Secretary of Commerce Stephen Davis (Figure 11–4) answered a request from the Chicago Federation of Labor.[7] Although the federation had planned to apply for a license, the application did not even reach Washington before Davis wrote the federation telling them that all the wavelengths were in use, and if the federation constructed a station, there would be no license forthcoming. Davis put the blame on the Fourth National Radio Conference on which it did not belong since the conference did not have the power to dictate

Figure 11–4 Stephen Davis. (AT & T Co.)

policy. Some politicians began to be concerned, and as the situation grew worse and the stations continued to interfere with each other, the office of the secretary of commerce sought an opinion from the attorney general.

In a letter dated June 4, 1926, the secretary asked the attorney general for a definition of power. The questions in the letter, as interpreted by the attorney general, were:

1. Does the 1912 Act require broadcasting stations to obtain licenses, and is the operation of such a station without a license an offense under that Act?
2. Has the Secretary of Commerce authority under the 1912 Act to assign wavelengths and times of operation and limit the power of stations?
3. Has a station, whose license stipulates a wavelength for its use, the right to use any other wavelength, and if it does operate on a different wavelength,is it in violation of the law and does it become subject to the penalties of the Act?
4. If a station, whose license stipulates a period during which only the station may operate and limits its power, transmits at different times, or with excessive power, is it in violation of the Act and does it become subject to the penalties of the Act?
5. Has the Secretary of Commerce power to fix the duration of the licenses which he issues or should they be indeterminate, continuing in effect until revoked or until Congress otherwise provides?[6]

The attorney general's answers made it clear that the problems were going to get worse, not better. The answer to the first question was affirmative. The act definitely provided for stations to be licensed, and stations operating without a license were clearly in violation. To the second question, the attorney general replied that the secretary had the right to assign a wavelength to each station under one provision of the act, but for the most part, the stations could use whatever other frequency they so desired, whenever they wanted. With the exception of two minor provisions, the attorney general also stated that the secretary had no power to designate hours of operation. Also lost was the contention over limiting power. The act stated that stations should use "the minimum amount of energy necessary to carry out any communication desired." The attorney general said: "It does not appear that the Secretary is given power to determine in advance what this minimum amount shall be for every case; and I therefore conclude that you have no authority to insert such a determination as a part of any license."

The third answer was obvious. Stations could use any other wavelength they desired. The act and the courts had confirmed that. That also answered question four. Since the secretary could not limit power or operating times beyond the actual license, stations were free to use other wavelengths with different power outputs and at different times from those stated in the license. The attorney general said in answer to the fifth question that he could, "find no authority in the Act for the issuance of licenses of limited duration."

Clearly a law which only a decade earlier had seemed firmly in control of the new medium now was almost worthless. Four months later on December 7, 1926, President Coolidge sent a message to Congress. He called for legislation to remedy a chaotic situation that threatened to destroy radio broadcasting.[9] The next day, he signed a joint resolution of Congress placing a freeze on broadcasting until specific legislation could be passed.

the Radio Act of 1927

Congress had been working on the Radio Act of 1927 before Coolidge's message. The act passed in both houses of Congress and received the president's signature on February 23, 1927. The Radio Act of 1927 was administered by the secretary of commerce and provided for the formation of a Federal Radio Commission (FRC) to oversee broadcasting. The act was intended to remain in force for only a year but was subsequently extended until 1934. With court decisions to guide them, Congress did an admirable job of plugging the holes left by the 1912 law.

The most important provision of the 1927 act was the formation of a

Federal Radio Commission, "composed of five commissioners appointed by the President, by and with the advice and consent of the Senate, and one of whom the President shall designate as chairman. . . ."[10] The law specified that each commissioner must be a citizen of the United States and would receive compensation of $10,000 for the first year of service. The commissioner system, as well as many other provisions of the 1927 legislation, became part of the Communications Act of 1934.

Other provisions in the 1927 act divided the United States into zones represented by individual commissioners. No more than one commissioner could be appointed from any one zone. One zone covered New England and the upper tip of the middle Atlantic states and included the District of Columbia, Puerto Rico, and the Virgin Islands. The second zone included the upper middle Atlantic states west to Michigan and Kentucky. The third zone covered the South and the fourth and fifth zones, the Great Plains and the West, respectively.

The act provided for the licensing of stations, but only for a specified time, and gave the government considerable control over the electromagnetic spectrum. The act also set out to define states' rights. Keep in mind that federal regulation over intrastate commerce, for which wireless was used, was not popular. So it was not surprising that the Radio Act of 1927 tried to avoid direct control of intrastate communication while at the same time retaining control of communication crossing state borders. The act stated that the law's jurisdiction would extend "within any State when the effects of such use extend beyond the borders of said State. . . ." The most quoted provision came from Section 4 in its statement that stations should operate "as public convenience, interest, or necessity requires. . . ."

Section 4 also prescribed "the nature of the service to be rendered by each class of licensed station and each station within any class." Control over frequency, power, and times of operation were covered by the act, giving the FRC power to "assign bands or frequencies or wavelengths to the various classes of stations, and assign frequencies or wavelengths for each individual station and determine the power which each station shall use and the time during which it may operate." Coverage areas for stations were to be fixed by the FRC, and the commission was to have power over "chain" or network broadcasting. Stations also were required to keep operating logs.

In addition to regulating the industry, the 1927 act gave the commission quasi-judicial powers with "the authority to hold hearings, summon witnesses, administer oaths, compel the production of books, documents, and papers and to make such investigations as may be necessary in the performance of its duties." The secretary of commerce was empowered "to prescribe the qualifications of station operators, to classify them according to the duties to be performed, to fix the forms of such licenses, and to issue them to such persons as he finds qualified." The secretary also was empowered to issue call letters to all stations and to "publish" the call letters. But before issuing a license, the government made certain that the prospective licensee gave up all rights to the frequency. The applicant had to sign "a waiver of any claim to the use of any particular frequency or wavelength. . . ." Once granted, station licenses were limited to three years.

To close the wavelength loophole of the 1912 legislation, the 1927 law stated: "The station license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies or wavelength designated in the license beyond the term thereof nor in any other manner than authorized therein." The act also discouraged monopolies and prohibited transferring licenses without the commission's approval. It also gave the commission power to revoke licenses for "issuing false statements or failing to operate substantially as set forth in the license."

Wording for the famous Section 315 of the Communications Act of 1934 came from the 1927 legislation: "If any licensee shall permit any person who is a legally qualified candidate for any public office to use a broadcasting station, he shall afford equal opportunities to all other such candidates for that office. . . ." Commercial broadcasting gained instant recognition and regulation with the requirement that paid commercials were to be announced as paid or furnished by the sponsor.

Putting a station on the air was another important provision of the act. As we shall see later in this chapter, this issue also arose in the appeals process. Specifically, the act stated: "No license shall be issued under the authority of this Act for the operation of any station, the construction of which is begun or is continued after this Act takes effect, unless a permit for its construction has been granted by the licensing authority upon written application thereof." The law acknowledged that construction permits for stations would specify "the earliest and latest dates between which the actual operation of such station is expected to begin, and shall provide that said permit will be automatically forfeited if the station is not ready for operation within the time specified. . . ."

The anticensorship provision, later to become incorporated into Section 326 of the Communications Act of 1934, was also included. Ironically, that provision was immediately followed with "no person within the jurisdiction of the United States shall utter any obscene, indecent, or profane language by means of radio communication."

We can see immediately the conflicts which could develop between not only these two provisions but also in the "convenience, interest, and necessity" clause. It was not long before the broadcasters and the government were indeed arguing. Yet keep in mind that the 1927 law is the very foundation of contemporary broadcast regulation. It was simple and straightforward, and the courts gave it strong support.

From 1927 to 1934, the Radio Act of 1927 withstood challenges from all sides. It achieved the ability to regulate effectively the expanding medium of "wireless," which now blanketed the nation with entertainment and news programming envisioned by few of the 1910 pioneer regulators. It is little surprise that the 1927 law was liberally quoted in the Communications Act of 1934, the law governing contemporary broadcasting. This law took broadcasting entirely out of the Department of Commerce and gave it separate status as an independent agency of government.

passing the Communications Act of 1934

It was becoming clear that broadcasting needed a new, more comprehensive regulatory agency. The FRC was still limited in its scope, having to share responsibilities with the U.S. Department of Commerce. Although the Commerce Department had at one time been an appropriate home, the prevailing trend was toward the public consumption of radio, overshadowing its commercial uses. Although commercial stations would still far outnumber those directing their signals to the public, guarding the public's convenience, interest, and necessity was no small task. After a number of proposals to coordinate regulation had been examined, President Franklin D. Roosevelt sent to Congress on February 26, 1934 a proposal for a separate agency known as the Federal Communications Commission. Roosevelt's message said that the FCC should have the authority "now lying in the Federal Radio Commission and with such authority over communications as now lies with the Interstate Commerce Commission—the services affected to be all of those which rely on wires, cables, or radio as a medium of transmission."[11]

Congress responded to Roosevelt's proposal by passing the Communications Act of 1934. With it came the Federal Communications Commission, which in the next 45 years was to see its domain come to reign over everything from citizens' band radios to satellite communication, from intrastate to international communication. Although it took only five months for Roosevelt's message to become law, the scope of the FCC already had been hammered out in court challenges to the 1927 law. In fact, much of the 1927 law was left intact, including the guiding phrase, "public convenience, interest, or necessity," which was retained as a nebulous but very powerful componenet of the 1934 legislation.[12] There were a few minor changes in the actual wording of the law. "Wavelength" was changed to "frequency," and whereas the 1927 law was concerned with "wireless communication," the FCC was to govern both wire and wireless.

As with most laws, the 1934 legislation has been amended many times. Although it would take volumes to discuss the decisions and cases which have molded today's version, part 3 of this text will examine some of the specific provisions and amendments of the 1934 act which directly affect current broadcasting.

summary

Chapter 11 traces the government's role in early broadcasting. An outgrowth of the Berlin meetings of 1903 and 1906, the Wireless Ship Act of 1910 provided an early safeguard for ships at sea. It required them to be equipped with radio apparatus which could communicate with other ships and shore stations. Violations meant possible fines and court proceedings. Two years later, the Radio Act of 1912 expanded the 1910 legislation but could not even begin to deal with radio's exploding growth in the 1920s. Four National Radio Conferences convened and discussed how to bring the new medium under government control in a way which was acceptable to the industry yet permitted the orderly use of the spectrum. The combination of these conferences and two landmark court cases which threatened the legality of the 1912 legislation generated enough support in Congress to pass the Radio Act of 1927. This act created the Federal Radio Commission which was renewed on a year-to-year basis while it fought a series of court battles to affirm its control over radio. Seven years later, Congress passed the Communications Act of 1934 and established the Federal Communications Commission, a separate, independent government agency.

spotlight on further learning

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12

the federal communications commission

FOCUS After completing this chapter we should be able to

List the primary responsibilities of the Federal Communications Commission.

List the areas over which the FCC does not have jurisdiction.

List the items on a typical agenda of an FCC meeting.

Understand the influence of individual commissioners on regulatory policy.

Explain the organization of the FCC, including its offices and bureaus.

Identify the different enforcement powers of the commission.

Discuss the criticism of the commission.

Few government agencies have had such a direct effect on the public as the Federal Communications Commission. Nearly everything we watch on television and hear on radio is in some way touched by the FCC's control over broadcasting stations, cable, satellites, even the telephone systems. Growing out of the Federal Radio Commission, the FCC is an independent agency accountable directly to Congress. In this chapter, we'll learn about the jurisdiction of the FCC, how it conducts business, its organization, its enforcement powers, and current criticism of its actions.

primary responsibilities

The FCC's thirteen areas of responsibility are:

1. The orderly development and operation of broadcast services and the providing of rapid, efficient nationwide and worldwide telephone and telegraph service at reasonable rates.
2. The promoting of safety of life and property through radio, and the use of radio and television facilities to strengthen national defense.
3. Consultation with other Government agencies and departments on national and international matters involving wire and radio communications, and with State regulatory commissions on telephone and telegraph matters.
4. Regulation of all broadcast services—commercial and educational AM, FM, and TV. This includes approval of all applications for construction permits and licenses for these services, assignment of frequencies, establishment of operating power, designation of call signs, and inspection and regulation of the use of transmitting equipment.
5. Review of station performance to assure that promises made when a license is issued have been carried out.
6. Evaluation of stations' performance in meeting the requirement that they operate in the public interest, convenience, and necessity.
7. Approval of changes in ownership and major technical alterations.
8. Regulation of cable television ...
9. Action on requests for mergers and on applications for construction of facilities and changes in service.
10. The prescribing and reviewing of accounting practices.
11. Issuance of licenses to, and regulation of, all forms of two-way radio, including ship and aviation communications, a wide range of public safety and business services, and amateur and citizens radio services.
12. Responsibility for domestic administration of the telecommunications provisions of treaties and international agreements. Under the auspices of the State Department, the Commission takes part in international communications conferences.

13. Supervision of the Emergency Broadcast System (EBS), which is designed to alert and instruct the public in matters of national and civil defense.[1]

As we can see from the preceding list, the commission's functions cover much more than just radio and television in the familiar sense. Telephone, telegraph, and cable all are within the FCC's jurisdiction as are applications of communication to public safety, transportation, industrial, amateur, and citizen service. In some cases, the regulation of these services is shared with other government agencies, such as local municipalities in the case of cable. A television station in New York City or a CB radio in Wyoming are both in the FCC's domain. This domain stretches beyond the 50 states into Guam, Puerto Rico, and the Virgin Islands.

what the FCC does not control

It is equally important to understand over what the FCC *does not* have jurisdiction.[2] Many people perceive the FCC as having broad powers of regulation. This is especially true when consumers are unhappy about something they have seen or heard on local radio or television. We already have learned that the commission has very little control over the content of broadcast messages. With the exception of obscene and indecent programming, and even that is vaguely defined, lotteries and deceptive advertising are the only areas the FCC can regulate without infringing on First Amendment rights. Even when it does act in these areas, a court battle is bound to arise over the First Amendment.

In the same sense, the FCC cannot tell a station when to air a program. Nor can it tell a station when to run commercials or public service announcements. The FCC will not substitute its judgment for that of the local broadcaster in those areas. Although some network contracts prohibit editing of certain programs, that is solely between the network and the station, not the FCC. Despite the nonediting clauses, the licensee retains control over local programming with the right to delete the network's entire offering, if it feels that it would not be in the local public interest to air it.

Although lotteries are forbidden, the FCC has little jurisdiction over the conduct of legitimate contests, especially over the awarding of prizes. If a station has a contest, and you win a prize which, for some reason, does not satisfy you, the best recourse would be to deal directly with the station or the manufacturer of the prize. The FCC would not have the authority to tell the manufacturer to give you a different prize or to help you obtain repairs for a defective item. Similarly, although stations broadcast a variety of sporting events, the FCC has no jurisdiction over the promoters or organizers of those sporting events. If your favorite boxer fails to appear on the local televised "golden gloves" championship, you can write the boxing commission, but the FCC will not be able to help you.

Similarly, the commission does not have any jurisdiction over countries whose radio or television signals cross into the United States. Although there are reciprocal international agreements on the use of the electromagnetic spectrum, the consumer in Michigan who complains to the FCC about a Canadian radio station would receive little satisfaction. A listener in southern California complaining to the FCC about a station in Mexico would have similar frustration. An exception would be if the Canadian or Mexican station were operating off its frequency and interfering with American stations, although even in these cases, the FCC would go through the regulatory agencies in Canada and Mexico to solve the problem.

The FCC also has no jurisdiction over news-gathering organizations, either local or national.[3] Press associations, such as United Press International, Associated Press, and Reuters are independent of the broadcast stations they serve and are not regulated by the FCC. To the extent that such organizations use radio frequencies or satellites to transmit information, the FCC does have jurisdiction, but only in a technical sense. Similarly, the commission does not directly control the networks but does control network-owned broadcasting stations. Musical-rights organizations, although directly serving stations and collecting royalties from them for airing performers' works, also are not under the jurisdiction of the FCC. Firms such as ASCAP, BMI, and SESAC are independent organizations not involved in activities which the commission controls. In addition, audience-measurement firms such as Nielsen and Arbitron are independent of the FCC, although a station's fraudulent use of audience ratings reflects on the licensee's commitment to serve the public interest.

The commission has instituted rules affecting the duplication (simulcasting) of programs on commonly owned AM and FM stations, but the FCC has no authority to tell a radio station to broadcast in stereo or quadraphonic sound nor to tell a television station to broadcast a program in color. Although the FCC can act in the public interest to question overcommercialization of radio and television, it does not have direct authority to tell a station to air so many commercials per hour. Likewise, the commission views the amount of public service programming as a condition for license renewal but has no authority to tell a station what public service programming to air. If the local licensee chooses to air public service announcements for the Red Cross instead of for the American Cancer Society, that is the station's prerogative. The exception to this would be if the announcement were on a controversial issue. Then, because of the Fairness Doctrine, the commission would want to ensure that the station aired a balanced presentation of the issue through whatever type of programming the station chose.

Libel and slander during radio and television broadcasts is another area over which the FCC has no jurisdiction. If you feel you have been libeled or slandered (both terms sometimes apply to "broadcast" speech which is "published"), your best recourse would be to consult an attorney, not the FCC. The FCC even shies away from these in matters of license renewal. In fact, when defamation did become an issue in a license renewal, the FCC stated in part:

> *It is the judgment of the Commission, as it has been the judgment of those who drafted our Constitution and of the overwhelming majority of our legislators and judges over the years, that the public interest is best served by permitting the expression of any views that do not involve, quoting from Supreme Court decisions, "a clear and present danger of serious substantive evil that rises far above public inconvenience, annoyance or unrest." . . . This principle insures that the most diverse and opposing opinions will be expressed, many of which may be even highly offensive to those officials who thus protect the rights of others to free speech. If there is to be free speech, it must be free for speech that we abhor and hate as well as for speech that we find tolerable or congenial.*[4]

Once again we see the First Amendment rising to protect free speech, even when that free speech is unpopular. In the same vein, program content which contains derogatory comments about sex, race, or religious beliefs also enjoys the protection of the First Amendment. Ethnic humor on such shows as "Sanford and Son" and "All in the Family" may offend some people, but any attempt to control this area of programming would be clearly outside the FCC's jurisdiction.

making decisions at the FCC

The commissioners hold weekly meetings and executive sessions to oversee commission activities. Their meetings are open to the public, a procedure started in 1977 under a congressional mandate. Closed meetings can be called by a majority vote of the entire commission. These meetings usually are on matters of national defense, manufacturer's trade secrets, criminal matters, or when the parties concerned with the FCC's decision specifically request that the meeting be closed.[5]

Meeting Agenda

A typical FCC agenda is classified so as to reflect the organization.[6] In order of business the categories include: Hearing, General, Safety and Special, Common Carrier, Personnel, Classified, CATV, Assignment and Transfer, Renewals, Aural, Television, Broadcast, and Complaints and

Compliance. The commission deals with these agenda items usually after it has heard a series of briefings by the appropriate FCC bureaus and offices. In a *Hearing,* the FCC acts as the final tribunal in an appellate process entailing decisions previously made by the FCC Administrative Law Judge and, in some cases, by the FCC Review Board. The *General* covers items not included in the other categories. Perhaps a representative from another federal agency will discuss the FCC's compliance with that agency's rules. *Safety and Special* deals with the application of broadcast communication to such areas as fire department, taxicab, and police department radios. Other industrial applications would be business use of mobile radios, citizens-band radio, and amateur (hams) services. The next item on the agenda, *Common Carrier,* is on the FCC's regulation of telephone and telegraph systems. Here, the commission acts as a quasi-public utility on issues concerning microwave and satellite systems, among others. Next comes *Personnel.* FCC staffing matters and promotion and appointments come under this agenda category. Promotions generally are routine, since three other FCC officers—the Bureau Chief, Personnel Chief, and Executive Director—have usually approved the promotions before they reach the seven commissioners.[7]

If national security, manufacturer's trade secrets, or other classified matters need to be discussed, they will be in the *Classified* category. *Cable* is next on the agenda. Approval of a new link-up between two cable systems, mergers of cable companies, examining difficulties a community might be having with a franchise or rate structure, and matters concerning a public-access channel can be resolved here. If you buy or sell a radio station, the transaction will be approved or rejected during the next order of business, *Assignment and Transfer.* The commission's deliberations may dwell upon previous inquiries about the transactions such as a Hearing or recommendations by the administrative law judge. If a group of stations is seeking to acquire more broadcasting properties, the discussion might center on the possibly powerful influence of a single owner of multiple broadcast properties and whether the public interest would be served by approving such a sale.[8] Transfers of licenses would be first approved during this order of business.[9] If you already own a station and it comes up for license renewal, the renewal will be acted upon during the next agenda category, *Renewal.* Most of the renewals reaching the commissioner level are contested renewals. Uncontested renewals are usually approved at the staff level.

If you are applying for permission to start a new radio or television station, a decision will be made on your application during either the *Aural* or *Television* agenda categories. Altering the service your station is already licensed to provide will also be acted upon at this time. If your station is on the air and for some reason wishes to seek a waiver of FCC rules, your request will be considered during the next item on the commission's agenda, *Broadcast.* For example, a network may request a waiver of the prime-time access rule to offer a special sports program. Or a station operating in an area in which there already is one network affiliate may request permission to affiliate with the same network.[10] Rule violations are considered during *Complaints and Compliance.* A station which has seriously violated FCC rules, complaints about the Fairness Doctrine, and fraudulent operating practices all would be considered at this time. It goes without saying that not every single violation is discussed by the entire commission. However, when a violator feels that there has been a legitimate injustice, then the case could reach this level.

Commissioner Influence on Regulatory Policy

Individual commissioners can help shape regulatory policy. Researchers Lawrence Lichty[10] and Wenmouth Williams, Jr.[11] studied the impact of commissioners' influence on FCC decisions. It is not surprising that during the early years of the Federal Radio Commission, the commissioners, four of whom were trained in law, were comfortable in the atmosphere of the frequent court challenges which surrounded these early decisions. The fact that the FRC added a legal division one year after it was formed demonstrates the importance that the commissioners placed on not only fighting but also winning those court challenges.

The FCC carried on this tradition when it began its six-year "trust-busting" campaign in 1939, breaking up networks and setting up rules for chain broadcasting. Two FCC chairmen, Frank R. McNich and James L. Fly, led the fight and weathered appeals which tried to claim that the regulations were unconstitutional. McNich had served on the Federal Power Commission and was a lawyer; Fly had headed the legal department of the Tennessee Valley Authority and had been in charge of judicial proceedings defending TVA's constitutionality.

The growth of television was also influenced partially by the attitudes of the FCC during the 1950s as Williams found the Kennedy administration to be characterized by a commission advocating strict regulation. Newton Minow set the pace with his "vast wasteland" speech and was joined by liberal FCC Democrats E. William Henry and Kenneth A. Cox. During the Kennedy administration, the FCC passed nonduplication rules governing simulcasting on AM and FM, and also brought cable under the regulatory umbrella. President Nixon's appointment of Benjamin Hooks emphasized the importance of minorities to broadcasting. The chairmanship of Richard Wiley under Presidents Nixon, Ford, and Carter was characterized by attempts, many successful, to streamline FCC decision making.

organization

Now that we have a basic understanding of how the FCC functions, let's examine its organization.

The Commissioners

At the top of the commission hierarchy are seven FCC commissioners headed by a chairperson. Appointed by the president of the United States and confirmed by the Senate, commissioners are prohibited from having a financial interest in any of the industries they regulate. This includes industries which are only partially in FCC-regulated businesses. No more than four commissioners can be from the same political party, and their seven-year terms are staggered so that one position opens up each year. Appointees who fill the unexpired term of a commissioner may or may not be reappointed when that term expires.

FCC Offices

Directly under the commissioners are the Office of Plans and Policy, Office of Opinions and Review, Office of Administrative Law Judges, Review Board, Office of General Counsel, Office of Chief Engineer, and Office of the Executive Director.[12]

Office of Plans and Policy. The Office of Plans and Policy is responsible for developing long-range policy decisions for industries coming under FCC jurisdiction. It also is responsible for assessing the policy implications of FCC decisions, providing policy analyses and recommendations to the commission staff, and coordinating policy research. The chief of the Office of Plans and Policy recommends budgets and priorities to the commission policy research program, and functions as the central account manager for all contractual research studies funded by the FCC.

Office of Opinions and Review. When the FCC makes a major decision, the document outlining that decision is written in consultation with and with the assistance of the Office of Opinions and Reviews. This office serves as the commission's legal staff, advising it on procedural matters, researching judicial precedent, and overseeing hearings ordered by the commission. The office then recommends action to the commission based on the evidence presented by the parties involved.

Office of Administrative Law Judges. This office is the first ladder in the appeals process. The administrative law judges preside over hearings and make initial decisions. It is not unusual for their decisions to be

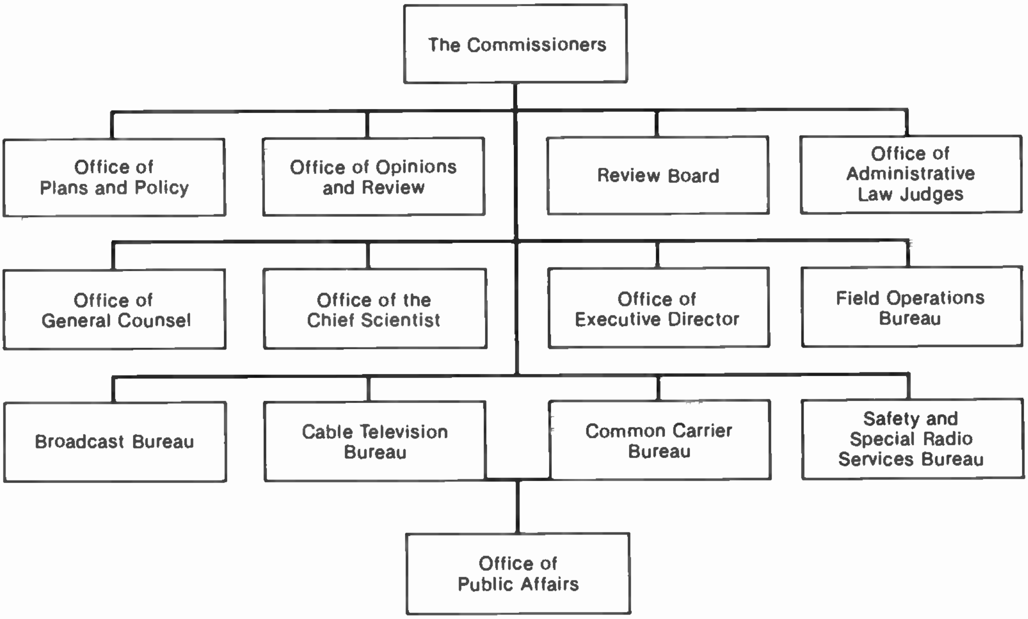

Figure 12–1 The Federal Communications Commission

appealed. When two applicants for a broadcast license appear at a hearing, both have a major investment at stake, and a ruling in favor of one party will prompt the other to continue the appeals process.

Review Board. The Review Board is the second step in the FCC appellate process, between the administrative law judges and the commissioners. In some cases, the decisions of the administrative law judges are reversed by the Review Board and then reversed again by the seven commissioners. This is not so much a reflection on the ability of the judges to adhere to judicial procedure as it is on the desire of the offended to exhaust every administrative possibility. In special cases, initial decisions even can be reviewed directly by the commissioners. If, for example, a renewal decision goes against a licensee, the licensee can appeal to the Review Board, which is made up of senior-level employees of the commission. Individual FCC bureaus also can appeal to the Review Board. If, for instance, a bureau rules against a licensee, and an administrative law judge rules in the licensee's favor, then the bureau can appeal to the Review Board. If the ruling still goes against the bureau, or the licensee for that matter, the party can appeal that ruling to the commissioners, who, as a body, choose which cases to accept for review. The seven commissioners are the last appeals step before the matter goes to the Federal Court of Appeals.

Office of the General Counsel. The Office of the General Counsel is the commission's attorney, representing it before the courts. The office also aids in preparing legislative programs supported by the commission and works closely with the attorney general and the Justice Department in cases which entail prosecution or jurisdiction across agency boundaries. An example of this cooperation would be in prosecuting violations of the Criminal Code or such other violations associated with a wrongdoing beyond those under the jurisdiction of the FCC. If a person steals radio equipment and then uses it to broadcast illegally, both the Justice Department and the FCC would become involved. The Office of the General Counsel also works closely with the Office of Opinions and Review, since the decisions which the latter writes may be the basis for the former's defense of the commission in court.

Office of the Chief Scientist. This office is the top "technical" office at the commission. The responsibilities of administering the electromagnetic spectrum and all of the policies associated with its implementation are developed by the Office of the Chief Scientist. About half the staff are engineers, and they consider such matters as determining the number of stations in a given market, equipment testing and certification, frequency allocations and modifications, and requests for increases in power output. The Office of the Chief Scientist also operates a Laboratory Division near Laurel, Maryland. Here, new equipment is tested to see if it meets FCC specifications. For example, manufacturers of radio and television transmitters must first receive authorization before they can sell them for broadcast use. The commission usually uses the technical data submitted by the manufacturer as a basis for its authorization, but on occasion, it spot-checks equipment to verify the test data. Citizens-band radios, for example, are tested at the Laurel, Maryland facility.[13] With the help of this testing, the FCC issues approximately 1,000 authorizations per year over a wide range of equipment. The office also works with other organizations testing new equipment and its applicability to broadcasting.

Office of Executive Director. Although the commissioners are the highest ranking officers of the FCC, the FCC Executive Director coordinates the overall operation of the commission. The position is somewhat analogous to a city manager running a municipality, even though the city council is the highest level in the administrative hierarchy. The executive director coordinates the activities of the different staff units, including the personnel division, the internal review and security division, the financial management division, and the public information officer.[14]

Bureaus

If it can be said that decisions are made by FCC offices, then they are implemented by FCC bureaus. Here, the day-to-day administrative services are performed which control the thousands of broadcast stations and licensees. The commission is divided into five bureaus: Broadcast, Safety and Special Radio Services, Cable Television, Field Operations, and Common Carrier. Those concerned most directly with broadcasting are the Broadcast Bureau, Cable Television Bureau, and Field Operations Bureau.

The **Broadcast Bureau** handles matters concerning commercial and noncommercial broadcasting stations. License renewals, for example, are handled by the bureau's Renewal and Transfer Division. Other divisions within the bureau include the Office of Network Study, the Broadcast Facilities Division, the Complaints and Compliance Division, the Hearing Division, the Policy and Rules Division, and the License Division.[15]

The **Cable Television Bureau,** as the name implies, is responsible for overseeing the daily operations of the cable television industry. Within this bureau are five divisions: the Policy Review and Development Division, the Compliance Division, the Research Division, the Special Relief and Microwave Division, and the Records and Systems Mangement Division.[16]

The prime enforcement arm of the FCC is the **Field Operations Bureau.** The Field Operations Bureau maintains a number of field offices in the larger cities across the United States, as well as mobile monitoring stations in specially equipped vans. Special investigative teams are assigned to make on-location inspections of stations, and a separate unit concentrates solely on CB radio violators. The field offices are also contact points for the public at which people can get information about the FCC and the communications industry. In addition, this bureau is responsible for administering FCC license examinations.

The Field Operations Bureau maintains sophisticated equipment which can trace a signal and pinpoint its location. It can thus catch illegal CB transmitters, violating amateur stations, and even "pirate" broadcasting stations operating on frequencies assigned to commercial AM and FM radio stations. Someone caught operating an illegal station will be raided by the FCC and U.S. Marshals, with equipment being seized as evidence. The Field Operations Bureau has four divisions:

(1) The Field Enforcement Division directs field enforcement programs, including the monitoring and inspection of stations. The Division also conducts investigations. (2) The Regional Services Division directs the public service programs including, among other things, radio operator

licensing. (3) Responsible for receiving and processing enforcement reports, such as violation files and investigations, is the Violations Division. (4) The Engineering Division of the Field Operations Bureau is responsible for providing engineering support and equipment specifications and construction for the field facilities.

In addition to the three previously mentioned bureaus, the **Common Carrier Bureau** oversees such areas as telephone and telegraph, and the **Safety and Special Radio Services Bureau** oversees such areas as aviation and marine communication. An **Office of Public Affairs** directs liaison between the Commission and the public.

enforcement power

The Communications Act specified that violators of its provisions would be penalized, and the commission has at its disposal a number of enforcement measures for the industry. Depending on the type of violation, the Commission may impose penalties ranging from a simple letter, a cease-and-desist order, a forfeiture (fine), short-term license renewal, license revocation, or denial of renewal.

Letters

Letters are usually used in less serious matters or ones in which the FCC accepts amends instead of imposing a forfeiture. Letters can be used to reprimand stations for incomplete community needs and ascertainment surveys, failure of programming to meet Fairness Doctrine requirements, or improper submission or failure to submit required FCC documents, such as employment reports or exhibits for a license renewal application. The letters are not always a reprimand, but in cases of license renewal, for example, they state that the license renewal is being withheld pending receipt of the required exhibit, and that after a certain date the license will be forfeited.

Cease and Desist Orders

Cease and desist orders are rare, partly because of the effectiveness of the commission's forfeitures and other sanctions. Gillmor and Barron cite one case of a minister asking the FCC to issue a cease and desist order prohibiting a religious program from being dropped by a station. The FCC declined to issue the order under the anticensorship provision of the Communications Act, although it confirmed that it did have the authority to issue it.[18] The cease and desist order was issued, on the other hand, by the commission to an AM station for broadcasting off-color remarks.[19]

Forfeitures

The most common sanction imposed on a station is a forfeiture, usually for a technical-rule violation or the more serious offense of fraudulent billing, although the latter can set the stage for a license revocation. The forfeitures vary and are based not only on the violation but also on the ability of the station to pay. They can cost up to $10,000 for serious violations by major market stations. Typical forfeiture notices for alleged violations are on the following partial list of apparent liabilities announced during a single week of commission activity:

—Broadcast Bureau ordered licensee to forfeit $250 for failing to calibrate remote ammeters to indicate within 2% of regular meter.

—Broadcast Bureau ordered licensee to forfeit $1,000 for failing to maintain actual antenna input power as near as practical to authorized power.

—Broadcast Bureau ordered licensee to forfeit $500 for failing to keep proper log as required.

—Broadcast Bureau ordered licensee to forfeit $500 for operating with antenna input power greater than 105% of authorized power during daytime operation.

—Broadcast Bureau notified licensee that it had incurred apparent liability for $1,300 for failing to maintain receiver capable of receiving Emergency Broadcast System tests or emergency action notifications and terminations at nighttime control point.

—Broadcast Bureau ordered licensee to forfeit $2,000 for operating with modes of power other than those specified in basic instrument of authorization.[20]

Notice that, with the exception of logging violations and failure to have equipment to monitor the Emergency Broadcast System, these alleged violations are infractions of technical rules. Now consider the following list of more sizeable, apparent liabilities:

—$10,000 for logging violations and for fraudulent billing practices.

—$5,000 for failure to make time available to political candidates at the lowest unit charge, charging different rates for political announcements of the same class and duration to legally qualified candidates for the same office, and failure to comply with logging requirements.

—$8,000 for failure to comply with logging requirements (program-length commercial.)

—$10,000 for falsification of operating logs.

—$10,000 for fraudulent billing practices.

—$8,000 for broadcasting information concerning a lottery.[21]

Notice the increased importance the commission assigns to alleged commercial violations. This is one area in which a maximum fine is not uncommon, and even stations in smaller communities can incur substantial liabilities from these violations. Remember, these listings **do not** necessarily imply that the stations are guilty, only that forfeiture notices were served.

When the FCC conducts an investigation, the station does have certain rights in seeking refuge from the penalties. First, the FCC cannot simply impose a fine on a station. Procedures outlined in the Communications Act state that a written notice of the apparent liability must first be sent by certified mail to the "last known address" of the permittee. The licensee or permittee then has thirty days in which to pay the fine or submit in writing the reason why it should not be held liable. The notice sent by the commission also must include the date, facts, and nature of the act or omission and must identify the "particular provision or provisions of the law, rule, or regulation or the license, permit, or cease and desist order involved." The fine is payable to the United States Treasury and can be collected in a civil suit if the violator refuses to pay. Of course, the station can appeal the commission's action through the usual administrative processes. In many cases, however, logs are powerful evidence as documents, and the excuse that an unsupervised or unqualified employee is to blame is no defense.

The commission issued its first letter of apparent liability in March 1961, one month after it outlined its policy and procedures regarding forfeitures. Authority to issue forfeitures had been granted in September 1960.[22] Researchers Charles Clift, Fredric Weiss, and John D. Abel studied the pattern of FCC forfeitures over the decade immediately after the law was enacted and found the highest percentage (87.1%) of forfeitures occurred because of failure to observe a provision of the act or a rule or regulation of the commission.[23] Included in this category were such infractions as logging violations, fraudulent billing, unlicensed or underlicensed operators, improper station identifications, and failure to conduct equipment performance measurements. The second highest category (8.0%) of forfeiture notices was failure to operate the station as set forth in the license. Violations of broadcasting hours, power, and presunrise authorization accounted for 3.4% of all forfeiture notices, including violations of sponsorship identifications and "rigged" contests. The fourth category—violations of lottery, fraud, or obscene-language sections of Title 18 of the United States Code—accounted for 1.4% of the forfeiture notices. The researchers found no forfeiture notices resulting from failure to observe a commission cease and desist order.

Short-Term Renewals

Next to forfeitures, the most severe sanction that can be imposed on a station is a short-term license renewal. These short-term renewals can range anywhere from six months to up to two years. Their purpose is to give the commission an early opportunity to review alleged past deficiencies.[24] Typical of short-term license renewals are those issued for the following infractions:

1. Station's equal employment.
2. Utilization of broadcast facility to gain competitive advantage in nonbroadcast business activities; fraudulent billing.
3. Fraudulent billing; inadvertent misrepresentations to the commission, falsification of logs; violation of logging rules; nonfulfillment of prior proposals concerning public service announcements; lack of supervision and control over station operations.
4. Broadcast of false, misleading, or deceptive advertising in connection with the promotion of a contest.
5. Predetermining the outcome of a contest.
6. Fraudulent billing.
7. Conducting contests during audience survey periods (hypoing)[25]

Notice again that alleged violations centering on commercial matters were responsible for most of these short-term renewals, indicating the seriousness with which the FCC views such actions.

One study investigated 156 short-term license renewals granted by the commission in the decade immediately following the passage of the statute.[26] It showed that 113 (72%) received one-year renewals, 29 stations (19%) received renewals for more than one year (but less than three), and 14 (9%) were licensed for less than a year. Three reasons accounted for the majority of short-term renewals: (1) improper control over station operation, which generally means that an owner was not adequately supervising employees; (2) repeated rule violations, both technical and programming; and (3) performance versus promise, or in other words, the licensee was not living up to the promises made in the previous license renewal.[27] Research has yet to tell us if any of these trends have changed in the second decade of their issuance, but a perusal of current short-term renewals at least finds the same reasons justifying FCC action.

Renewal Denials and Revocation

The most serious penalty that the FCC can impose on a licensee is to deny it the right to operate, either through revoking its license or denying renewal of its license. In a sweeping action, the FCC revoked the licenses of the entire Alabama Educational Television Commission in 1975. It was a precedent demonstrating that the commission was not going to tolerate what it considered lack of service to an audience, in this case, the black audience. The action came before public broadcasting stations were required even to conduct community needs and ascertainment surveys. Nevertheless, the FCC acted on the premise that the licensee still has the responsiblilty to determine the needs of its audience and to program in accordance with those needs.

Two years later, an administrative law judge denied renewal of a noncommercial station licensed to the board of trustees of the University of Pennsylvania. The FCC upheld the decision, and among the criticisms leveled at the station was that the licensee had delegated and subdelegated authority to students. Although the FCC accepted the station's application for a new license, the renewal denial woke many boards of trustees up to the fact that even they had the responsibility to see that a broadcasting station is operated in the public interest. If it is not, the university can be held responsible.

criticism of the commission

Perhaps because it regulates a very "visible" industry, and perhaps because that industry directly affects all of us every day, the FCC has received criticism from the public, the Congress, and even commissioners within its ranks.

Conflict with Judicial Precedent

One criticism is that the FCC has issued rulings that conflict with judicial precedent. Nicholas Johnson and John Dystel cite a case in which the FCC issued permission for AT&T to build a 350-foot tower near a residential area of Finksburg, Maryland.[28] Despite opposition from citizens' groups, the commission granted the request, partly because AT&T had already conducted an environmental impact study and found that the tower would not harm the environment. Johnson and Dystel note that the tower was approved although the courts had ruled that federal agencies cannot rely on interested parties' environmental-impact statements.[29]

Staff Organization

The relationship of the FCC's middle staff to the commissioners is another bone of contention among critics. Erwin Krasnow and Lawrence Longley in their book, *The Politics of Broadcast Regulation*, point out that the middle staff exerts influence over the commissioners by controlling the channels of communication at the FCC.[30] Thus, when the commissioners need to choose among alternative policies, they must rely on information which their staff feels is relevant. The authors also state that since hundreds of decisions are made every day, implementation of policy must be delegated to middle-staff personnel.[31]

Frequency Allocation Matters

Furthermore, not everyone feels that the way in which the FCC allocates frequencies on the electromagnetic spectrum is in the public's best interest. For example, the designation of certain frequencies for marine use means that there are wide areas of the country in which these frequencies go unused, simply because there is no demand for marine communication.[32] Moreover, because this policy has been perpetuated for years, trying to change it now would entail major capital expenditures for the industries affected. The commission's local station concept, allocating certain frequencies to lower-powered stations serving small communities, has drawbacks in that it ties up a sizeable portion of the spectrum for local station use, especially since one way of reducing crowding on the spectrum is to switch to regional allocations. The result of this would be fewer but higher powered stations serving large regions. The idea, although technologically sound, seems somewhat impractical when we think of the "local" service that would be lost.[33] A regional station in Chicago serving a small town in Illinois would be hard pressed to include that Illinois community's local news in its regional programming.

EEO Policies

Two other criticisms have landed squarely on the FCC's Equal Employment Opportunity (EEO) policies and the effect of citizens' groups on FCC decision making. A report by the Citizen's Communications Center claims the criteria for stations' compliance with FCC-EEO requirements are vague and can be met by broadcasters who still discriminate.[34] The report also asserts that the commission requires an unrealistically high standard of proof of discrimination practices before designating a hearing in a renewal case. Another report critical of the Commission's EEO policies was issued by the U.S. Commission on Civil Rights.[35] This report suggests that the FCC should improve the image of women and minorities in television programming, an area many would argue is clearly outside the commission's jurisdiction and would violate the First Amendment.

Citizen Participation

A report by the Rand Corporation suggests that the commission should do more to encourage citizen participation, one effort being to support legislation which would provide financial assistance to citizens' groups participating in commission proceedings.[36] Giving citizens' groups access to evidence which might support their cause also is high on the list of recommendations. In current judicial processes, a person or group can gain access to information, called the right of discovery, only after proceedings have begun in the courts or, in the case of the FCC, after a hearing has been designated. The FCC has started a new Actions Alert program designed to solicit advice on FCC rule making. Written in plain English, the Actions Alerts are issued to citizens' groups and interested parties who can then give written opinions to the FCC (Figure 12–2).

Decision-Making Processes

One of the most serious criticisms of the FCC is its sluggishness in making important decisions. Krasnow and Longley state that the FCC is "incapable of policy planning, of disposing within a reasonable period of time the business before it, of fashioning procedures that are effective to deal with its problems."[37] A classic case is the proceedings affecting the assignment of WHDH-TV in Boston. The case started in 1947 when WHDH filed an application for a license to operate Channel 5. This channel allocation was the subject of competing applications and FCC decrees for 25 years. It was one of the longest proceedings ever to come before the FCC. Professors Robert Smith and Paul Prince reviewed the chronology of the WHDH-TV case and concluded that if there were no clear winner in the proceedings, "one party was a significant loser: the public."[38] Sterling Quinlan, writing a lighter book about the case, quotes a former commissioner as saying, "Let's face it. This was the 'Whorehouse Era' of the commission. When matters were arranged, not adjudicated."[39]

Figure 12–2

December 13, 1976

FCC Actions Alert

Special Feedback Edition

FCC Seeks Comments
On Cable Franchise Standards

The Federal Communications Commission invites your comments on questions raised regarding the current standards governing contracts between local authorities and cable companies. As the enclosed news

Conflicts of Interest

The commission often has been called to task for potential conflict of interest because of its staff-owned stocks of corporations regulated by the FCC. A staff report of the House Oversight and Investigations Subcommittee has criticized members for transferring shares of stock in communications-related industries to immediate members of their families (although the law, as it now stands, does not prohibit that practice.) Some of the stock ownership reported by the subcommittee included shares of General Electric owned by the spouse of a staff member in the Office of the Chief Engineer, shares of AT&T owned by the spouse of a staff member in the Common Carrier Bureau, and shares of AT&T owned by the spouse of an engineer in charge of an FCC field office.[40]

Johnson and Dystel divided their own criticism of the FCC into seven areas. They contend that (1) the FCC delves into areas beyond its expertise and issues beyond its ken; (2) it takes years to resolve important cases; (3) the FCC is manipulated by its own staff and the industries it is supposed to regulate. The results of this are precedents which return to "haunt" the commission; (4) principled decision making does not exist because the FCC no longer approves of its own rules and precedents, and instead ignores them—either by waiving them or evading them; (5) the commission ignores its own administrative principles and those established by the judiciary; (6) the commissioners decide cases they do not understand; and (7) the FCC has yet to develop "rational" policies for governing its day-to-day decisions.[41]

Criticism of the commission will undoubtedly continue, regardless of future changes. However, it is time for an in-depth evaluation of the entire commission. It is operating under 1934 procedures, a time when cable, satellites, microwaves, and fiber optics were only a dream. As it stands today, the prospects of the communications industry simply becoming unmanageable are real. The commission has established bureaus responsible for specific areas of the industry, but because so much is at stake when two competing corporations seek allocations or permission to develop technology, a ruling against one sends the matter through an appeals process which eventually reaches the seven commissioners. Those seven may very well be forced into a decision they are not qualified to make. As a result, the numerous reversals between the administrative law judges and the courts play havoc with anything that even resembles judicial precedent.

summary

Chapter 12 discussed the operation of the Federal Communications Commission. We learned that the FCC has thirteen areas of responsibility. Some of these include the orderly development and operation of broadcast services; control over AM, FM, TV, telephone, common carrier, cable and satellite communications; starts of new stations and transfer of ownership of those already operating; responsibility of domestic administration of the telecommunications provisions of treaties and international agreements; and supervision of the Emergency Broadcast System. The FCC does not have jurisdiction over such things as program scheduling, awarding of prizes in contests, broadcasting outside the United States and its possessions, news-gathering organizations, and libel and slander.

The typical agenda of an FCC meeting includes the following items, corresponding in many ways to the functions and organization of the commission: hearing, general, safety and special, common carrier, personnel, classified, cable television, assignment and transfer, renewal, aural, television, broadcast, and complaints and compliance. Research has taught us that, although selected as a bipartisan group, individual commissioners can have considerable influence over the policy directions the FCC takes. Organization of the FCC includes, along with the commissioners, the Office of Plans and Policy, Office of Opinions and Review, Office of Administrative Law Judges, the Review Board, Office of General Counsel, Office of Chief Engineer, and Office of Executive Director. The bureaus of the Commission include the Broadcast Bureau, Cable Television Bureau, and Field Operations Bureau.

No government agency can function effectively as a regulator without enforcement powers. The FCC is no exception. At its disposal are such measures as letters, cease and desist orders, forfeitures, short-term renewals, renewal denials, and revocations.

Criticism of the FCC has surfaced in recent years and has included such issues as decisions conflicting with judicial precedent, the influence on and separation of the middle staff from the commissioners, the FCC's allocation of frequencies, affirmative action policies, citizen participation in commission decisions, and the decision-making processes of the FCC.

spotlight on further learning

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13

control of broadcast programming

FOCUS After completing this chapter we should be able to

Tell how the concepts of a limited spectrum and mass influence affect broadcast regulation.

Discuss the application of Section 315 to political broadcasting.

Trace the development of the Fairness Doctrine.

Explain how the FCC regulates obscene, indecent, and profane material.

Define *prime-time* access.

Describe how the broadcast press is attempting to bring television cameras into judicial proceedings.

Understand broadcasters' efforts at self-regulation.

To understand why there is control of broadcast programming, we first must understand the legal forces which have helped mold both domestic and international broadcast communication. They include both basic constitutional documents and obscure local ordinances, ranging from major international treaties affecting satellite communication and multinational networks to agreements guarding against "electronic" border disputes.

limited spectrum and mass influence

The control of broadcasting centers on supply and demand. We know that if there is a great demand for a product and a shortage of that product, certain rules will be written to avoid chaos. Imagine a group of children all wanting a piece of candy, but there are only half as many pieces of candy available as there are children. Who gets the candy? Perhaps the children who have perfect behavior records will get the candy. Perhaps only those who agree to share their candy with others will get it. Perhaps those who eat responsibly and do not gobble will be rewarded. Or perhaps only those who can afford to buy the candy will get some. Our example illustrates the need for controls both to regulate the allocation of the product and to maintain order.

Now transpose our example to the allocation of frequencies on the electromagnetic spectrum. The spectrum has only so much space upon which radio and television stations can operate. Consequently, certain rules to govern the allocation and operation of stations are necessary. This limited-resource concept is the reason behind much broadcast regulation.

The second important concept is the influence of broadcasting on a great number of people. The citizens-band radio that sends out a five-watt signal to a passing motorist has little impact on a "mass" audience. If the operator decides to sing songs into the microphone, tell a joke, or provide "smokey" reports, the chances are the FCC will not be overly concerned. On the other hand, if a 50,000-watt clear-channel radio station decides to forego all its regular programming for a steady diet of songs sung by announcers, jokes, and traffic reports, then the station will have a difficult time justifying its privilege to operate. The fact that broadcasting sends messages to the public has a considerable effect on society. Thus, to assure that society is protected from abuse, there are certain rules.

At this point you may say, "Fine, we set up certain rules, people follow the rules, and the system functions." Unfortunately it is not that simple, and everyone from FCC commissioners, to citizens' groups, to broadcasters argue the legitimacy of the regulatory process. Part of the discussion centers on the legal philosophy upon which our society operates. America is considered a free country. Nelson and Teeter write: "Seventeenth and Eighteenth Century thought in much of Western Europe and America turned to faith in man's reason as the safest basis for government."[1] Lee Loevinger describes the practical application of this philosophy as negative or proscriptive rather than positive or prescriptive. That is, law in America, for example, forbids behavior which might harm society, but it does not require behavior which society has determined to be beneficial.[2] Nor does it require the best behavior of which one is capable, or even behavior that is socially desirable. At first, this attitude may seem as though it would undermine the good of society. Not so, Loevinger assures us, "when the law prohibits antisocial conduct, it leaves an extemely wide area of personal choice and individual liberty to the citizen."[3]

From the standpoint of broadcasting, we can see the head of regulatory conflict beginning to protrude. Although we must control the allocation of frequencies on the electromagnetic spectrum, to control programming on those frequencies goes against traditional American legal philosophy.

The arguments run between two extremes. One point of view suggests a total lack of control; supporters point out that the First Amendment assures free press and free speech. Some legal scholars even suggest that one freedom embodies the other.[4] The other point of view supports total control of broadcasting. Those arguing for total control argue their case using four assumptions: (1) there is a reliable and authoritative basis for determining program quality; (2) the public interest can be determined in one broadcast without reference to all other broadcasts; (3) there are programs which meet the assumed authoritative government standards; and (4) if the government commands it, then quality programs will be produced.[5]

Where does all this lead us? It has led to a regulatory system that greatly affects what radio and television stations will program. We now will examine in detail regulatory control and some of the areas in which federal regulation directly influences broadcast programming. We'll begin with Section 315 of the Communications Act, which concerns political broadcasting, examine the Fairness Doctrine, examine such areas as obscenity and profanity, prime-time access, and coverage of judicial proceedings.

Section 315 of the Communications Act

Of all of the provisions of the Communications Act of 1934, few have received as much attention or notoriety as Section 315, which regulates political broadcasting. The provision instructs the broadcaster and candidate in how the electronic media are to be used as part of our political system. It, along with the Fairness Doctrine, has an effect on how we, the consumers of broadcast communication, are informed of our electoral process.

The most crucial wording of Section 315 is its "equal-time" provision which states: "If any licensee shall permit any person who is a legally qualified candidate for public office to use a broadcasting station, he shall afford equal opportunities to all other such candidates for that office in the use of such broadcasting station."

Definitions Guiding Equal-Time Provisions

The Communications Act defines a legally qualified candidate as:

> any person who has publicly announced that he is a candidate for nomination by a convention of a political party or for nomination or election in a primary, special, or general election, municipal, county, state or national, and who meets the qualifications prescribed by the applicable laws to hold the office for which he is a candidate, so that he may be voted for by the electorate directly or by means of delegates or electors, and who:
> (1) has qualified for a place on the ballot or
> (2) is eligible under the applicable law to be voted for by sticker, by writing in his name on the ballot, or by other method, and
> (i) has been duly nominated by a political party which is commonly known and regarded as such, or
> (ii) makes a substantial showing that he is a bona fide candidate for nomination or office, as the case may be.[6]

In addition to this definition are hundreds of state and local statutes further clarifying political eligibility. Yet broadcasters are prohibited from deciding themselves who may be considered legally qualified. It makes little difference if the candidate has a chance of winning. If the law says the candidate is qualified and the candidate has publicly announced his or her candidacy, then the equal-time provisions will apply. Those provisions also apply to cable television systems.

Anticensorship Provisions

As a further safeguard against unfair treatment to political candidates, Section 315 expressly prohibits the broadcaster from censoring the content of any political message. The law succinctly states the licensee

TV Station Cancels Program To Avoid Political Hassling

Rep. Patricia McDermott, D-Pocatello, threw a monkey wrench into plans for live television coverage Friday night of the Republican version of the State of the State message by demanding equal time for a Democratic reply.

KTVB (Channel 7) in Boise originally had planned a live broadcast of the message by legislative leaders Sen. Phil Batt, R-Wilder, and Rep. Allan Larsen, R-Blackfoot, with comments by leading Democrats to balance the program, said Sal Celeski, KTVB director of public affairs.

He initially proposed that the Republican message be broadcast live on his weekly news program "Viewpoint" during its usual 6:30 p.m. time slot.

"Then Patty called me and started saying that wasn't going to be fair. She said the Republicans would be there in that room (in the Statehouse) with a partisan crowd, and we'll be in your cold studio, it won't be equal. She thought we should give them another time slot.

"I said 'Hey, I don't have time slots to give,' " Celeski said. "Then I got to thinking about it, and it's just not worth the hassle." So he canceled plans for the live broadcast.

Figure 13–1 *(The Idaho Statesman)*

"shall have no power of censorship over the material broadcast under provisions of this section."

Until 1959, broadcasters were confused by the noncensorship rule, fearing it was only a matter of time until some candidate blatantly libeled an opponent, and the station was sued for damages. The dreaded event occurred in 1959 in North Dakota when U.S. senatorial candidate A. C. Townley charged on the air that the North Dakota Farmers' Union was Communist-controlled. The Farmers' Union sued the station and Townley for $100,000. But the North Dakota Supreme Court ruled that the station was not liable and that the suit should have been brought against Townley alone. Undoubtedly, the Farmers' Union thought about that, but since Townley made only $98.50 a month, the prospect for recovering damages was not bright.[7]

The Farmers' Union appealed to the Supreme Court. Justice Hugo Black, in delivering the opinion of the Court, stated: "Quite possible, if a station were held responsible for the broadcast of libelous material, all remarks even faintly objectionable would be excluded out of an excess of caution . . . if any censorship were permissible, a station so inclined could intentionally inhibit a candidate's legitimate presentation under the guise of lawful censorship of libelous matter."[8]

Exemptions to the Equal-Time Provisions

Exempt from the equal-time provisions are appearances by candidates on these types of news programming:

1. bona fide newscast,
2. bona fide news interview
3. bona fide news documentary (if the appearance of the candidate is incidental to the presentation of the subject or subjects covered by the news documentary), or
4. on-the-spot coverage of bona fide news events (including but not limited to political conventions and activities incidental thereto), shall not be deemed to be use of a broadcasting station within the meaning of this subsection.

In the fall of 1975, the FCC added to the exemption list political debates and news conferences, as long as they were broadcast in their entirety, and if the broadcaster made a good-faith judgment that they constituted a bona fide news event. In the spring of 1976, a three-judge panel of the U.S. Court of Appeals in Washington, D.C. upheld the FCC's right to include the added exemption. The court split in a two-to-one decision and in offering the verdict, noted that it took comfort in the fact that Congress could correct the FCC if it had overstepped its authority in the added exemption.[9]

The exemption itself is a hot political issue, since party loyalty as well as congressional autonomy tends to surface during an election year. For example, the FCC's exemption permitted Gerald Ford and Jimmy Carter to participate in nationally televised debates in 1976. For John F. Kennedy and Richard Nixon to debate in 1960, Congress had to suspend Section 315.[10] Without the suspensions and exemptions, networks and local stations would have been faced with a plethora of minority-party candidates demanding equal time.

Selling Time: The Lowest Unit Charge

Besides granting equal time to candidates, Section 315 also spells out how much they are to be charged for the use of broadcast facilities:

(b) The charges made for the use of any broadcasting station by any person who is a legally qualified candidate for any public office in connection with his campaign for nomination for election, or election, to such office shall not exceed-

(1) during the forty-five days preceding the date of a primary or primary runoff election and during the sixty days preceding the date of a general or special election in which such person is a candidate, the lowest unit charge of the station for the same class and amount of time for the same period, and

(2) at any time, the charges made for comparable use of such station by other users thereof.

The above is known as the "lowest unit charge" rule. To understand it more clearly, assume that you are the sales manager for a television station. The station's rate card charges an advertiser $1,000 to buy a single, one-minute commercial in prime time. An advertiser purchasing two commercials receives a discount and is charged only $850 per commercial. We'll assume that the rate card permits an advertiser purchasing 25 commercials to receive an even bigger discount, when each commercial costing $500. Along comes candidate John Doe who is running for municipal judge. Doe wants to buy just one commercial to remind his friends that he is running for office. He wants it to run in prime time. What will you charge him for the cost of his one commercial? You will charge him $500. Even though he is buying only one commercial, the law states that you must charge him the "lowest unit charge." If he wanted to purchase a commercial in a fringe-time period during which the rates are lower, then you would charge him the "lowest unit charge" for that time period.

Access: The Relationship of Section 312 to Section 315

Our discussion of Section 315 would not be complete without mentioning another section of the Communication Act of 1934, Section 312, and how it relates to Section 315. Section 312 is actually a prerequisite to 315, since 312 succinctly states that the station must not deny access to any candidate for federal office, regardless of what form that access takes. Section 312 cautions the broadcaster that a station license may be revoked, "for willful or repeated failure to allow reasonable access to or to permit purchase of reasonable amounts of time for the use of a broadcasting station by a legally qualified candidate for Federal elective office on behalf of his candidacy."

Notice that the law reads "*federal elective office.*" This clause has been a bone of some contention and confusion in interpreting Section 315, especially when candidates on other than the federal level are involved. Some stations have used Section 312 as grounds for refusing to sell commercial time to candidates other than those running for federal offices. The advantage to such a policy is mainly economic. First, there are fewer federal candidates than local candidates, translating into fewer political commercials. You may ask whether the station is not in business to sell commercials. Yes, but remember the lowest unit charge. If a department store pays a nondiscounted rate for commercials but cannot get on the air because of the many political commercials sold at the lowest unit charge, then the station is losing money. Second, federal candidates often place their advertising through advertising agencies. Although the station still must give a discount to the agency, the number of commercials purchased is usually more than what candidates would purchase on their own. Thus, the total amount spent is closer to the actual profit made from typical business advertising. Third, the commercials from the agency are usually prerecorded, eliminating the need for the local station to tie up its staff and facilities helping a local candidate produce a commercial which may run only one time at the lowest unit charge.

By inserting the term *federal*, Section 312 left no definition of "reasonable access" for candidates running for state and local offices. Historically, the station has been flexible in such cases. In its *Guidelines* to political candidates, the commission says: "The licensee in its own good-faith judgment in serving the public interest may determine which political races are of greatest interest and significance to its service area, and therefore may refuse to sell time to candidates for less important offices, provided it treats all candidates for such offices equally."[11]

the Fairness Doctrine

The Fairness Doctrine was first issued in 1949 as an FCC report to broadcasters on handling controversial issues with "fairness" to all sides.[12] The FCC reexamined the doctrine in ~~policy~~ statements issued in 1964, 1974, and 1976.

Mayflower Decision

The Federal Radio Commission, in discussing the limited spectrum space, noted that if issues "are of sufficient importance to the listening public, the microphone will undoubtedly be available. If not, a well-founded complaint will receive the careful consideration of the commission."[13] Attention to this fairness issue crystalized in 1941 with the "Mayflower" decision, involving station WAAB in Boston.[14] The Mayflower Broadcasting Corporation petitioned the FCC to give Mayflower the facilities of WAAB, which were up for renewal. Although the FCC ruled in favor of WAAB in a review of WAAB's past performance, the station was strongly criticized by the commission for its practice of "editorializing." The FCC stated that it was "clear that with the limitations in frequencies inherent in the nature of radio, the public interest can never be served by a dedication of any broadcast facility to the support of his own partisan ends."[15] The FCC offered the opinion that "a truly free radio cannot be used to advocate the causes of the licensee. . . . In brief, the broadcaster cannot be an advocate."[16] The Mayflower decision successfully discouraged other stations from jumping on the editorial bandwagon.

WHKC and Scott Decisions

While the Mayflower decision was stifling editorials, the Code of the National Association of Broadcasters was stifling discussion of controversial issues by prohibiting the purchase of commercials to air those issues. It was not long before one station was caught in the triangle between the FCC, the NAB Code, and the First Amendment. Station WHKC in Columbus, Ohio, believing it was operating in the public interest, adhered to the NAB Code and promptly found itself in a dispute with a labor union.[17] The union claimed that the station had refused to sell it time and had censored its submitted scripts.

The union filed a petition against WHKC's license renewal. The FCC held a hearing on the matter between August 16 and 24, 1944, and heard the argument about the NAB Code. By October, the union and the station had agreed to a compromise. The agreement broke with the code and prohibited any further censorship of scripts, dropping the station's policy of banning selling time for controversial issues. The FCC stated the station must be

> *. . . sensitive to the problems of public concern in the community and . . . make sufficient time available on a nondiscriminatory basis, for full discussion thereof, without any type of censorship which would undertake to impose the views of the licensee upon the material to be broadcast.*

Further support for airing controversial issues came in 1946 when Robert Harold Scott of Palo Alto, California, filed a petition asking the FCC to revoke the licenses of radio stations KQW, KPO, and KFRC. Scott claimed that he wanted time to expound his views on atheism, balancing the station's "direct statements and arguments against atheism as well as . . . indirect arguments, such as church services, prayers, Bible reading and other kinds of religious programs."[18] Scott did not get the station's license revocation, but in its decision, the FCC stated:

> *The fact that a licensee's duty to make time available for the presentation of opposing views on current controversial issues of public importance may not extend to all possible differences of opinion within the ambit of human contemplation cannot serve as the basis for any rigid policy that time shall be denied for the presentation of views which may have a high degree of unpopularity.*

Issuing the Doctrine

The commission began to tackle the editorial issue in March and April of 1948. In eight days of hearings on the subject, it heard from 49 witnesses; 21 other persons filed written motions. From the hearings came a statement issued by the FCC on June 1, 1949 under the heading, *In the Matter of Editorializing by Broadcast Licensees.* It was to become known as the "Fairness Doctrine." In the doctrine, the commission reasserted its commitment to free expression of controversial issues of public importance as stated in the WHKC and Scott decisions. It also reversed the Mayflower decision by supporting broadcast editorials. The commission came "to the conclusion that overt licensee editorialization, within reasonable limits and subject to the general requirements of fairness . . . is not contrary to the public interest."[19]

The Fairness Primer

As expected, there was a series of court cases and complaints about abuse of the Fairness Doctrine. Finally, it became necessary in 1964 for the FCC to issue some clarifying guidelines. The 1964 document, commonly called the "Fairness Primer" was a compilation of representative FCC rulings from over those years.[20] It gave people an opportunity to study the FCC's decisions, shedding light on other stations' practices and policies, seeing when complaints might be warranted, and guiding stations on how to meet Fairness Doctrine requirements.

Still waiting, however, was a major legal test of the constitutionality of the Fairness Doctrine. It came in an appeals court case in 1967, reaching the Supreme Court in 1969. Called the "Red Lion decision," it affirmed the constitutionality of the Fairness Doctrine. We'll examine this landmark case in more detail.

The Red Lion Decision

The Red Lion decision involved the Red Lion Broadcasting Company of Red Lion, Pennsylvania. In November, 1964, the Reverend Billy James Hargis lashed out on Red Lion's radio station against the author of a book about Barry Goldwater. The author, Fred J. Cook, was held in low esteem by Hargis, who spelled out what he felt to be the less favorable aspects of Cook's career as a writer. Cook contacted the station for a chance to reply to Hargis. But the station claimed that it did not have to offer free time to Cook unless he could prove that there was no commercial sponsorship available to present his views. Cook went to the FCC, which ruled in his favor, citing the Fairness Doctrine. In the case of *Red Lion Broadcasting Co.* v. *Federal Communications Commission*, the appeals court upheld the FCC's decision.[21]

At that point, the Radio-Television News Directors Association entered the picture and appealed the case once more, this time to the United States Court of Appeals for the Seventh Circuit in Chicago. In the case of *Radio-Television News Directors Association* v. *United States*, the court ruled that the Fairness Doctrine's personal attack and editorial rules would "contravene the first amendment."[22] But RTNDA's victory was short-lived. The FCC then took the case to the Supreme Court which reviewed both the circuit and appeals courts' decisions. The Supreme Court ruled: "In view of the prevalence of scarcity of broadcast frequencies, the Government's role in allocating those frequencies, and the legitimate claims of those unable without governmental assistance to gain access to those frequencies for expression of their views, we hold the regulations and ruling at issue here are both authorized by statute and constitutional."[23] With this, the Supreme Court upheld the FCC and reversed the decision in the RTNDA case. The Fairness Doctrine now was not only a broadcast regulation, but one reaffirmed by judicial precedent by the highest court in the land.

Personal Attack Rule

One area of the Fairness Doctrine which remained somewhat nebulous was the broadcast of direct personal attacks on individuals or organizations. When the Red Lion issue came to the FCC's attention, it decided that this was the time for a ruling. Becoming effective on August 14, 1967, the FCC's rules regarding personal attack read:

> *(a) When, during the presentation of views on a controversial issue of public importance, an attack is made upon the honesty, character, integrity or like personal qualities of an identified person or group, the licensee shall, within a reasonable time and in no event later than one week after the attack, transmit to the person or group attacked (1) notification of the date, time and identification of the broadcast; (2) a script or tape (or accurate summary if a script or tape is not available) of the attack and (3) an offer of a responsible opportunity to respond over licensee's facilities.*

The rules exempt foreign groups or foreign public figures, certain types of attacks made by political candidates during campaigns, and with the same provisions as in Section 315, various bona fide news events.

At the same time that it spelled out the new personal attack policy, the FCC also spelled out new rules covering editorials:

> *(c) Where a licensee in an editorial, (i) endorses or (ii) opposes a legally qualified candidate or candidates, the licensee shall, within 24 hours after the editorial, transmit to respectively (i) the other qualified candidate or candidates for the same office or (ii) the candidate opposed in the editorial (1) notification of the date and the time of the editorial; (2) a script or tape of the editorial; and (3) an offer of a reasonable opportunity for the candidate or a spokesman of the candidate to respond over the licensee's facilities:* **Provided, however,** *that where such editorials are broadcast within 72 hours prior to the day of the election, the licensee shall comply with the provisions of this paragraph sufficiently far in advance of the broadcast to enable the candidate or candidates to have a reasonable opportunity to prepare a response and to present it in a timely fashion.*

With these 1967 rules, broadcasters now know exactly what is expected of them when such incidents occur on their stations. They do, however, have the discretion to determine what constitutes a personal attack. Here, although not completely free, the FCC has permitted broadcast management to remain in charge of its local programming, somewhat unimpeded by a federal agency.

Broadcast Advertising

The FCC's position on the fairness issue is that the overall programming of a station should reflect its commitment to fairness, not just a single program. The position of advertising in this programming became a contested issue when WCBS-TV was approached by New York lawyer John W. Banzhaf, who requested equal time to reply to cigarette commercials. WCBS-TV refused to grant him time, but the FCC agreed with Banzhaf. The FCC's decision was upheld by the appeals court which tried to confine the decision to cigarette advertising. But that was too much to hope for, and over the years, the Fairness Doctrine has applied to many factions of advertising. (Cigarette advertising meanwhile was banned on radio and television after 1971 by the Public Health Cigarette Smoking Act of 1969.)

In a sweeping FCC order, eight California stations were caught in a Fairness-Doctrine controversy over programming on nuclear power plants. At a time when people in California were being asked to sign a petition for a referendum on nuclear power plants, the stations aired commercials sponsored by the Pacific Gas and Electric Company. The commercials promoted nuclear power and power plants. Citizen-action groups brought the matter to the FCC's attention and in 1974, filed an action against thirteen stations. The commission found that five stations had presented the issue fairly with programming advocating the anti-nuclear stand. Eight others were required to show the FCC how they intended to comply with the Fairness Doctrine. The commission felt that the issue was controversial and of public importance and investigated "to the minute" the amount of time the stations had devoted to different sides of the issue.[24]

The 1974 Report

In 1974 the FCC reopened hearings on the Fairness Doctrine and concluded the hearings by issuing an updated report on the applicability of the Fairness Doctrine. More importantly, the 1974 Report also attempted to create an atmosphere of flexibility in interpreting the doctrine. What the FCC, the broadcasters, and the public had been worrying about was the absence of guidelines defining such sensitive issues as "controversial issue" or "reasonable opportunities for contrasting viewpoints." The commission summed up its feelings on these matters as follows:

> *The Fairness Doctrine will not ensure perfect balance and debate, and each station is not required to provide an "equal" opportunity for opposing views. Furthermore, since the Fairness Doctrine does not require balance in individual programs or a series of programs, but only in a station's overall programming, there is no assurance that a listener who hears an initial presentation will also hear a rebuttal. However, if all stations presenting programming relating to a controversial issue of public importance make an effort to round out their coverage with contrasting viewpoints, these various points of view will receive a much wider public dissemination.*

The 1974 Report did not diminish the debate over the Fairness Doctrine.

Reconsidering the Fairness Doctrine: 1976

The commission decided to reconsider the Fairness Doctrine in 1976 after citizens' groups wanted more access to broadcasting. The FCC generally reaffirmed its decisions in the 1974 report. It felt that the doctrine should continue to be applied to advertisements of public issues, not of specific products. It agreed that broadcast editorials should come under the aegis of the doctrine and reaffirmed the right of the broadcaster to decide how the doctrine should be applied locally. If the FCC did have to intervene, it was felt the probable action would be simply to require that the station provide time for opposing viewpoints.

regulating obscene, indecent, and profane material

One of the most complex areas of broadcast regulation is obscene and indecent programming. The statutes governing such programming have evolved from both the Radio Act of 1927 and the Communications Act of 1934. The Radio Act of 1927 provided for penalties of up to $5,000 and imprisonment for five years for anyone convicted of violating the act, including its obscenity provisions. The Communications Act of 1934 changed this to $10,000 and two years in jail, stating that the violator's license could be suspended for up to two years. In 1937, the penal provisions covering obscenity were amended to include license suspension for those transmitting communications containing profane or obscene "words, language, or meaning." The license suspension was no longer limited to two years, and the word "meaning' became even more appropriate as television became more popular.[25]

The U.S. Criminal Code

In 1948, Congress took the obscenity provisions from the Communications Act of 1934 and put them into the United States Code. Thus, the U.S. Criminal Code, Section 1464 states: "Whoever utters any obscene, indecent, or profane language by means of radio communication shall be fined not more than $10,000 or imprisoned not more than two years or both."[26] "Radio communication" includes television. Both the Department of Justice and the FCC have the power to enforce Section 1464. Penalties include forfeiture of a license or construction permit and fines of $1,000 for each day the offense occurs, not to exceed a total of $10,000. The Justice Department also can prosecute under Section 1464 and send a licensee to jail.

Although there are other cases in which the FCC has acted against stations which have broadcast obscene, indecent, or profane material, two stand out. One was an Illinois station's "topless" format and the other a New York station's broadcast of comedian George Carlin's monologue on words that cannot be said on radio or television.

Topless Radio and Seven Dirty Words

In 1973, the FCC found itself in the obscenity arena with a case involving a station in Oak Park, Illinois. The topic for the call-in program on February 23 was oral sex, and female listeners called moderator Morgan Moore with graphic descriptions of their experiences. The format, also employed at other stations, was known as "topless radio." Female listeners were not the only ones to contact the station. The FCC notified them of their apparent liability of $2,000 for violating *both* the indecency and obscenity clauses of the Criminal Code.[27]

Two groups, the Illinois Citizens Committee for Broadcasting and the Illinois Division of the American Civil Liberties Union, asked the FCC to reconsider the ruling. When the commission declined, the Illinois Citizens Committee for Broadcasting appealed in *Illinois Citizens Committee for Broadcasting* v. *Federal Communications Commission*. On November 20, 1974, the court upheld the FCC's action and in effect ruled that the commission was acting constitutionally.

On the afternoon of October 30, 1973, WBAI-FM warned its listeners that the following broadcast included sensitive language which might be offensive. What followed was a recording by comedian George Carlin from his album "George Carlin: Occupation Foole." Carlin's monologue was a satire on seven four-letter words which could not be used on radio or television because they depicted sexual or excretory organs and activities. A month later, the FCC received a complaint from a man who said that he had heard the broadcast while he was driving with his son. It was the only complaint received about the broadcast, which had been aired as part of a discussion on contemporary societies' attitudes toward language.

The FCC issued a declatory ruling against WBAI-FM and stated that such language " . . . describes, in terms patently offensive as measured by contemporary community standards for the broadcast medium, sexual or excretory activities and organs, at times of the day where there is a reasonable risk that children may be in the audience."[28]

The commission also rationalized that broadcast media should be treated differently from print media in regulating indecent material, because broadcast media are instrusive, based on four considerations:

> *(1) children have access to radio and in some cases are unsupervised by parents; (2) radio receivers are in the home, a place where people's privacy interest is entitled to extra deference; (3) unconsenting adults may tune in a station without any warning that offensive language is being or will be broadcast; and (4) there is a scarcity of spectrum space, the use of which the government must therefore license in the public interest.*[29]

The commission reiterated that it was not in the business of censorship but did have a statutory obligation to enforce those provisions of the criminal code that regulated obscene, indecent, or profane language.

Whatever good intentions the commission had in issuing its declatory order, the U.S. Court of Appeals for the District of Columbia did not agree and did little to uphold it. Striking down most of the commission's major arguments, the court gave the FCC a judicial setback bordering on embarrassment. It first found that the commission's order was in direct violation of Section 326 of the Communications Act of 1934, which prohibits the FCC from censoring programming. Although the FCC clearly stated that it was not censoring, the appeals court felt it was doing just that simply by issuing the order. The issue did not stop there, however. The case went to the United States Supreme Court where the FCC found itself back in favor. The single complaint from a father about what his son heard on radio had set a strong precedent for future FCC action against questionable material on the air and made it clear that there were at least seven words that could cause broadcasters much trouble if they decided to use them on the air.

prime-time access

Another area of programming which involves the FCC is the amount of time local stations devote to network television programming.

Concern over the dominance of network programming prompted the FCC to take measures assuring that alternative programming would also be aired during the evening hours. From these measures came the prime-time access rule. The latest Prime Time Access Rule III (PTAR III), charges stations in the top fifty markets, which are either network-affiliated or network-owned, to clear an hour from network prime-time programming, which is 7:00 P.M. to 11:00 P.M. in Eastern and Pacific time zones and 6:00 to 10:00 P.M. in Central and Mountain time zones.[30] PTAR III was "refined" by order of the United States Second Circuit Court of Appeals in the case *National Association of Independent Television Producers and Distributors et al.* v. *FCC*.[31] The rule is designed to (1) give independent producers and syndicators a market for their programming and (2) encourage local stations to develop creative programming. By applying the rule to the top fifty markets, the FCC has successfully covered the nation. Yet the rule has been more successful in providing time for syndicated programming than in stimulating local creativity. The result has been a plethora of quiz and game shows in the 6:00 to 8:00 P.M. time periods across the country.

PTAR III still allows a series of exemptions. Stations can broadcast network or off-network documentaries, public affairs, and children's programming. Public affairs programming is defined the same as it is in the FCC logging rules, as " . . . talks, commentaries, discussions, speeches, editorials, political programs, documentaries, forums, panels, roundtables, and similar programs primarily concerning local, national, and international public affairs." Feature films also can be broadcast as can network news programming of special interest to the viewing audience. In other words, if a network provides affiliates with coverage of a major developing news event, such as an assassination or natural disaster, the local affiliates can carry the program and have it count as prime-time access. If a television station produces an hour of local news which immediately precedes the prime-time access hour, for example, the local news from 6:00 to 7:00 P.M., then the station can carry network news programming up to one-half hour into the access period, or until 7:30 P.M.

Sports programming also is exempted. If a sports event is scheduled to end at the beginning of prime-time access but lasts longer, stations are permitted to continue their sports coverage. Major sports events in which all prime time is devoted to their coverage, such as New Year's Day football games or coverage of the Olympic games, receive the same exemption. Under continued scrutiny is the antiblackout law (Public Law 93-107), which permits the telecast of a home football game during prime time, but only if the game is sold out 72 hours before kickoff.

coverage of judicial proceedings

Although not an issue of direct concern to the FCC, the broadcast press has been deeply concerned over the Court's reluctance to allow broadcast coverage of judicial proceedings. At the heart of the issue is permission to have television cameras record the proceedings and for stations to broadcast live and video-taped courtroom activity, including testimony. The idea itself of cameras in the courtroom was conceived before television became part of the American scene. When Bruno Hauptmann was tried for the kidnapping of Charles Lindbergh's son, the courtroom resembled more a county fair than a judicial proceeding. Reporters were falling over reporters, vendors were selling souvenirs, and when the judge barred cameras from the courtroom, an enterprising chap managed to sneak a camera into the balcony and snap a picture of the courtroom that appeared in papers across the country.

Since the Lindbergh trial, everyone from the Supreme Court to bar associations has grappled with the difficult issue of how much publicity is too much and how or if television cameras and recording equipment interfere with a fair trial. The American Bar Association approved its famous Cannon 35 two years after the Lindbergh trial. Amended in 1963 to include television, Cannon 35 forbade either the taking of photographs or the broadcasting of court proceedings. Individual states were quick to affirm Cannon 35's principles and place it in statutes affecting court proceedings. The Federal Rules of Criminal Procedures, specifically Rule 53, carries the prohibition of cameras to federal courts. A special committee of the Judicial Conference of the United States reaffirmed Cannon 35 in 1968, calling for prohibition of "... radio or television broadcasting from the courtroom or its environs, during the progress of or in connection with judicial proceedings." Clearly, from the standpoint of the courts and of many lawyers, there is popular support for the Sixth Amendment's position.

Such claims for constitutional priority are not founded merely in supposition or conjecture. The annals of case law are filled with overturned verdicts, appeals, and charges of biased juries because the news media have been less than restrained in their coverage. Cases which stand out include *Rideau* v. *Louisiana.*[32] In this case, the suspect was interviewed by a country sheriff, and the interview was filmed and played on local television. The suspect's confessions made during the interview and the subsequent televising of those confessions prompted the defense attorney to request a change of venue. A denial and subsequent guilty verdict were all that was needed for the United States Supreme Court to reverse the conviction and state that the jury should have been drawn from a community whose residents had not seen the televised interview.

The case of Texas businessman Billie Sol Estes added fuel to this constitutional fire. Estes was tried and convicted of swindling. An appeals court affirmed the conviction, but when the case reached the United States Supreme Court in 1965 in *Estes* v. *State of Texas,* the conviction was reversed.[33] Massive national publicity surrounded the trial, and when it first went to court, the trial judge permitted television coverage of portions of the trial. In fact, the initial hearings were carried live. The scene was described by Justice Clark, who delivered the opinion in the case: "Indeed, at least 12 cameramen were engaged in the courtroom throughout the hearing taking motion and still pictures and televising the proceedings. Cables and wires were snaked across the courtroom floor, three microphones were on the judge's bench, and others were beamed at the jury box and the counsel table. It is conceded that the activities of the television crews and news photographers led to considerable disruption of the hearings."

Justice Clark summarized four areas in which television could potentially interfere with a trial: (1) Television can have an impact on the jury. The mere announcement of a televised trial can alert the community to "all the morbid details surrounding" the trial. "Every juror carries with him into the jury box those solemn facts and thus increases the chance of prejudice that is present in every criminal case." (2) Television can impair the quality of testimony. "The impact upon a witness of the knowledge that he is being viewed by a vast audience is simply incalculable. Some may be demoralized and frightened, some cocky and given to overstatement; memories may falter . . . ." (3) Television places additional responsibilities on the trial judge. Along with other supervisory duties, the judge also must supervise television. The job of the judge, "is to make certain that the accused receives a fair trial. This most difficult task requires his undivided attention." (4) For the defendent, television "is a form of mental if not physical harassment, resembling a police lineup or the third degree. The inevitable closeups of his gestures and expressions during the ordeal of his trial might well transgress his personal sensibilities, his dignity, and his ability to concentrate . . . ."

Despite the Supreme Court's decision, broadcasters continued their fight for courtroom access for the omnipresent television camera (Figure 13–2). There were breakthroughs in 1972 when the American Bar Association's House of Delegates approved a Code of Professional Responsibility, permitting the use of television in the courtroom for such activities as presenting evidence. Another breakthrough came in 1974 when the Washington State Supreme Court instructed a county superior court to select a trial and experiment with televising it, for "educational" purposes. The experiment was generally successful. In Las Vegas, Nevada, in the fall of 1976, KLAS-TV televised in color a criminal court trial. Sixty hours of courtroom activity, including interviews with the defendant, jury, and attorneys, were videotaped and edited for a three-part, prime-time special. One of the most publicized trials was of a teenager accused of murder, which took place in Florida in 1977. The trial was televised, and segments appeared regularly on network television, calling national attention to the camera-courtroom issue (Figure 13–3). A few weeks later, when the verdict was read in an Indiana kidnapping case, cameras again were present, and the courtroom once again appeared on national television.

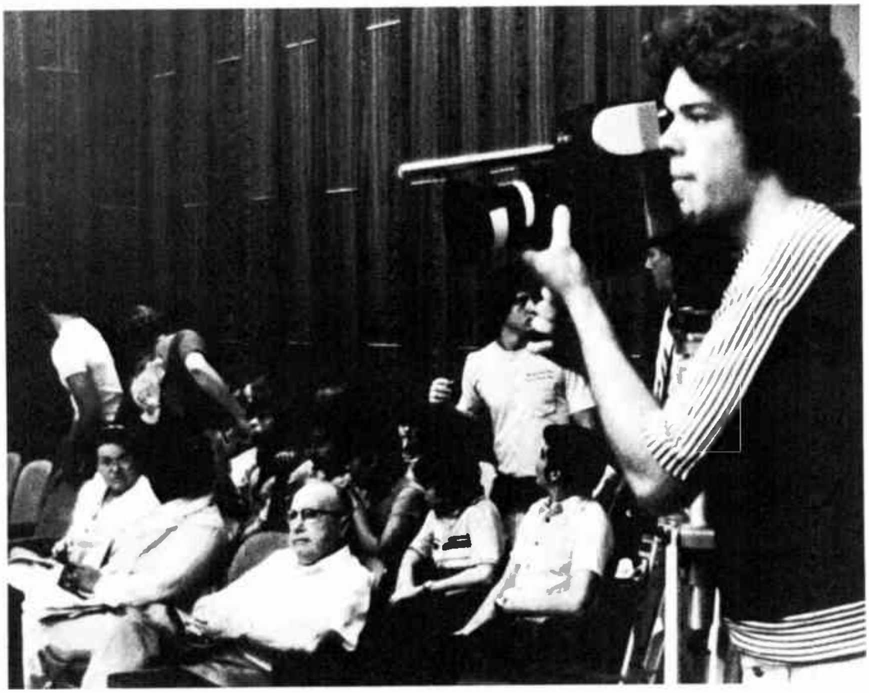

Figure 13–2 Smaller cameras and progressive judges have made television cameras in courtrooms more and more common. (Dick Wetmore and WPBT)

Figure 13–3 A national television audience witnessed courtroom scenes during the trial of a Florida teenager accused of murder. (George Chase and WPBT)

The future of broadcast coverage of judicial proceedings rests on two factors: (1) the willingness of the courts to recognize the public's right of access to trials by permitting in the courtroom the apparatus necessary to capture the actual sounds and sights of the court in session, and (2) the willingness of the broadcast press to use restraint and the highest professional attitude and activity while covering a trial. Certainly, not all of the courts across the country are going to open their doors overnight to broadcasting. The process will be slow and gradual, and many trials will remain closed at the request of the parties involved. Even with television technology, the familiar and talented courtroom artists employed by many of the networks and larger television stations will continue their craft of capturing on the sketch pad the activity judges bar from the eyes of the television camera (Figure 13–4).

self-regulation

Although the government has been active in controlling the content of broadcast programming, the broadcasters themselves, through their individual professional associations, also have contributed. The amount of self-regulation that broadcasters employ seems in many ways to be in direct proportion to the amount of government regulation. Specifically, self-regulation, when effective, can actually displace government regulation before it begins. Within the broadcasting industry and related fields there are numerous guidelines and codes of ethics which are at least part of the by-laws of many organizations, even if they are not always followed by their members.

Stations which belong to the National Association of Broadcasters also can belong to the NAB Radio Code and the NAB Television Code. The codes themselves are not new. Organized in 1922, the NAB was originally founded

> *to foster and promote the development of the arts or aural and visual broadcasting in all forms; to protect its members in every lawful and proper manner from injustices and unjust exactions; to do all things necessary and proper to encourage and promote customs and practices which will strengthen and maintain the broadcasting industry to the end that it may best serve the public.*

By 1937 the broadcasting industry, through the NAB, was adopting its first set of self-regulatory guidelines. There was a major revision in 1945, and since that time the codes have been regularly updated to reflect both the pressure of government regulation on one side and the pressure of NAB members on the other. The Code Authority of the NAB administers the codes with the approval of the NAB board of directors. The executive

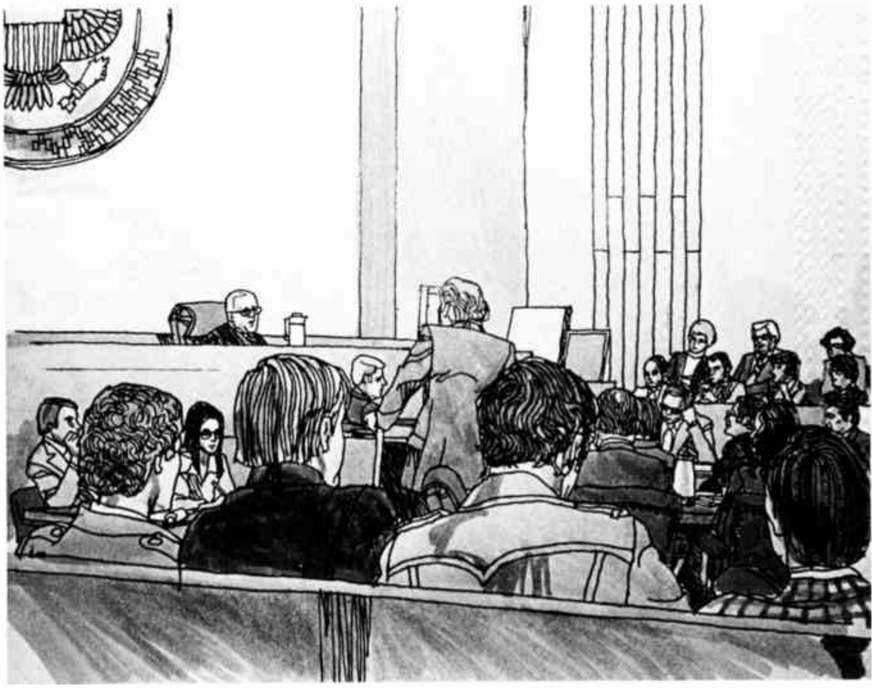

Figure 13–4 Defense attorney F. Lee Bailey rises to his feet as the scene from the Patty Hearst trial is captured by NBC courtroom artist Walt Stewart of KRON-TV in San Francisco. (Walt Stewart)

staff of the Code Authority enforces the codes with regular monitoring of NAB-member stations. Broadcast advertising and programming are the two principal areas of both the Radio and Television Codes, and membership in the code is by subscription and open to "any individual, firm or corporation which is engaged in the operation of . . . a broadcasting station or network . . . or which holds a construction permit . . . for a radio or television station." Membership in the code requires an agreement by the station to abide by NAB advertising standards and also permits the station to use the code seals (Figure 13–5) on on-air promotions and advertising literature used by the station.

Along with the NAB Codes are codes of other organizations such as the Radio-Television News Directors Association, the Society of Professional Journalists-Sigma Delta Chi, American Women in Radio and Television, and advertising associations. Press councils operate nationally and in many states and communities in which other than legal complaints of the print as well as broadcast press can be aired.

NAB
Radio
Code

NATIONAL
ASSOCIATION OF BROADCASTERS
TELEVISION
CODE
SEAL OF GOOD PRACTICE

Figure 13–5

summary

Government control of programming is a major concern of the broadcasting industry. Its basis is in the fact that the electromagnetic spectrum on which radio and television waves travel is a limited resource and must have safeguards to assure its responsible use. Coupled with this is the tremendous influence that radio and television have, which in the case of satellites crosses international boundaries.

Two areas of great concern to both broadcasters and the public are regulations resulting from Section 315 of the Communications Act and regulations from the Fairness Doctrine. Section 315 is mainly concerned with political broadcasting and assures that candidates for public offices will have the same opportunities to gain access to the broadcast media as other candidates for the same offices do. Key parts of Section 315 include its definitions of equal time, its anticensorship provisions, and the lowest unit charge. The Fairness Doctrine traces its roots back to the 1940s when the FCC prohibited editorializing and then reversed itself in 1949. Since then the doctrine has been revised considerably, mostly through FCC policies and court decisions. It now covers all areas of radio and television broadcasting, including advertising, and as far as overall programming is concerned, broadcast news programming.

An area in which the FCC has found one of its strongest footholds is in control of obscene, indecent, and profane material. Supported by the U.S. Criminal Code, the FCC has levied sanctions against numerous stations. Two of the most famous cases were the frank sexual discussions found in "topless radio" formats and the use of comedian George Carlin's monologue on words prohibited on radio and television.

Broadcasters' relationships with their networks also have come under the FCC's jurisdiction. The prime-time access rule requires stations to permit a certain amount of local programming to air in the early evening hours preceding prime-time network programming. Although some stations have developed a creative "magazine" format and other television fare, others have chosen to rely on syndicated programs, such as game shows.

Although not actually under FCC jurisdiction, the broadcast press has been waging a continuing battle to permit television cameras in courtrooms and to bring entire judicial proceedings to the television screen. Although the courtroom artists will remain an important part of courtroom coverage, more and more states are experimenting with television cameras in judicial chambers.

Self-regulation has been practiced by many broadcasters. Through such organizations as the National Association of Broadcasters, broadcasters have managed to avoid some federal regulations and have attempted to improve the quality of radio and television programming.

spotlight on further learning

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14

regulating station operations

FOCUS After completing this chapter we should be able to

Identify the sections of a station's programming log.
Identify the sections of a station's operating log.
Tell what is in a station's public inspection file.
Explain the basic procedures in conducting a community needs and ascertainment survey.
List the steps in a typical license renewal.
Discuss cross-ownership rules.
List the steps in starting a new station.

Most businesses, whether regulated or not, must keep certain records. Accounting ledgers, tax returns, and profit-loss statements are essential to any enterprise. Businesses which are highly regulated, such as broadcasting, are burdened by even more "paperwork." Although broadcasters complain that the paperwork drains their time and is a considerable expense, the reason the FCC requires such detailed information is to assure operation in the public interest. Station program logs, for example, tell what programs aired at what time, what commercials were broadcast, when news programming aired, what time the station signed on and off the air, whether a program was live or recorded, and whether that program was news, entertainment, or something else.[1] Such records help prevent an unscrupulous broadcaster from interfering with other stations, refusing to meet the promises stated in the license renewal, overcharging advertisers, and other violations of FCC rules.

In chapter 14, along with examining program logs we also shall discuss operating logs, the station's public inspection file, conducting community needs and ascertainment surveys, license renewal, cross-ownership rules, and steps to starting a new broadcasting station.

program logs

FCC regulations require every radio and television station to keep logs detailing what they broadcast to the public. Since our discussion of logs will be in general terms, you should consult the specific FCC regulation before actually making entries in a log or examining it to see if it meets precise FCC standards. Logging requirements, although fairly standard, are fulfilled in different ways by different stations.

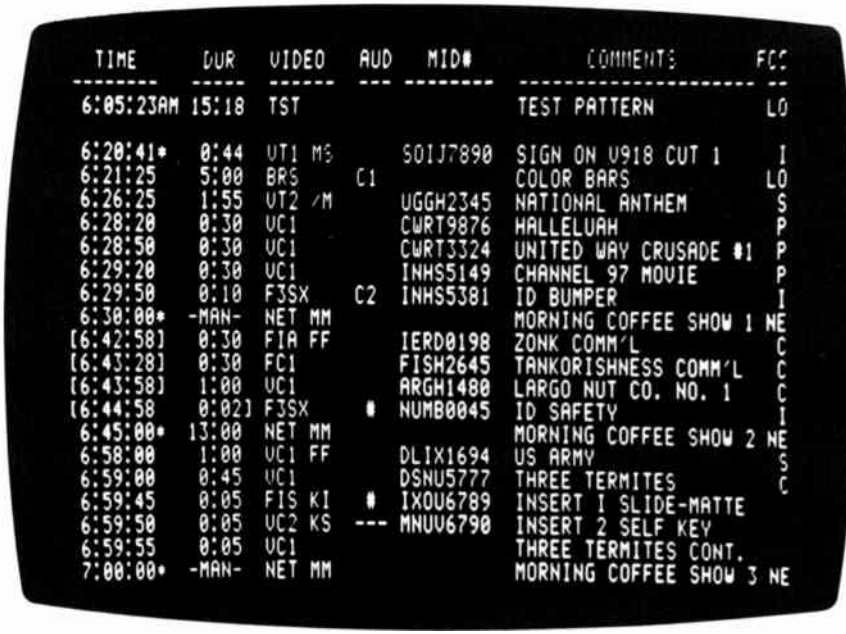
FCC rules require program logs to be kept by someone who is familiar with FCC standards, in most cases, the person operating the station's control board. A secretary not in programming is not permitted to make log entries. Neither is a general manager sitting in a back office, although the general manager, program director, or representative of the licensee can make corrections on a program log when the person who made the original entry is not available.

Regulations also require that logs be legible and organized in an easily accessible location at the station. An FCC inspector would have little sympathy for logs containing illegible entries, logs scattered around the station at different locations, logs not filed in chronological order, or worse yet, missing logs. Some stations make duplicate copies of logs just to protect against loss or damage. More and more stations are using automatic logging systems (Figure 14–1) which take many of the logging tasks, although not the responsibility, away from the person operating the control board.

To understand program logs, let's examine the one in Figure 14–2. It illustrates one type of program log which meets basic FCC requirements. Program logs also must have a cover sheet which explains all of the categories, sources, and types of programs which are abbreviated on the individual program entries.

At the top of the program log is the station's call letters (in this case WXXX), the name of its parent corporation, and the town in which it is licensed. The log is clearly identified ("program" log) to differentiate it from other station logs which we shall learn about later. The log also tells the page number, (page 2), the day of the week, (Wednesday), the date, (7/16/80), and the time zone, (Eastern Standard Time [EST]). Logs always must be kept in *local* time. To the left of the first column is a number for each line. This is not required by the FCC but can be helpful in giving directions to the operator. For example, if a mistake is made on the log, the program director can leave a note for the board operator referring to a specific line and page number on which the correction is to be made.

Figure 14–1 (Harris Corporation, Broadcast Products Division, P.O. Box 4290, Quincy, Illinois 62301)



TIME	DUR	VIDEO	AUD	MID#	COMMENTS	FCC
6:05:23AM	15:18	TST			TEST PATTERN	LO
6:20:41*	0:44	VT1 MS		SOIJ7890	SIGN ON V918 CUT 1	I
6:21:25	5:00	BRS	C1		COLOR BARS	LO
6:26:25	1:55	VT2 /M		UGGH2345	NATIONAL ANTHEM	S
6:28:20	0:30	VC1		CWRT9876	HALLELUAH	P
6:28:50	0:30	VC1		CWRT3324	UNITED WAY CRUSADE #1	P
6:29:20	0:30	VC1		INHS5149	CHANNEL 97 MOVIE	P
6:29:50	0:10	F3SX	C2	INHS5381	ID BUMPER	I
6:30:00*	-MAN-	NET MM			MORNING COFFEE SHOW 1	NE
[6:42:58]	0:30	FIA FF		IERD0198	ZONK COMM'L	C
[6:43:28]	0:30	FC1		FISH2645	TANKORISHNESS COMM'L	C
[6:43:58]	1:00	VC1		ARGH1480	LARGO NUT CO. NO. 1	C
[6:44:58	0:02]	F3SX	#	NUMB0045	ID SAFETY	I
6:45:00*	13:00	NET MM			MORNING COFFEE SHOW 2	NE
6:58:00	1:00	VC1 FF		DLIX1694	US ARMY	S
6:59:00	0:45	VC1		DSNU5777	THREE TERMITES	C
6:59:45	0:05	FIS KI	#	IXOU6789	INSERT I SLIDE-MATTE	
6:59:50	0:05	VC2 KS	---	MNUV6790	INSERT 2 SELF KEY	
6:59:55	0:05	VC1			THREE TERMITES CONT.	
7:00:00*	-MAN-	NET MM			MORNING COFFEE SHOW 3	NE

AM	FM	TV

Chevrolac Broadcasting Co., Inc.
Littletown, Plainstate

STATION WXXX DAILY PROGRAM LOG

6. Commercial Matter or Announcement Type: Commercial Matter (CM); Public Service Announcement (PSA); Mechanical Reproduction Announcement (MRA); Announced as Sponsored (√).
7. Program Source: Local (L); Network (Identify); Recorded (REC).
8. Program Type: Agricultural (A); Entertainment (E); News (N); Public Affairs (PA); Religious (R); Instructional (I); Sports (S); Other (O); Editorials (EDIT); Political (POL); Educational (EO).

page 2
day Wednesday
date 7/16/80
time EDT

	Station Identification Time 1	PROGRAM TIME Begin 2	PROGRAM TIME End 3	PROGRAM TITLE — SPONSOR 4	Commercial Matter or Announcement Duration 5	Commercial Matter or Announcement Type 6	PROGRAM Source 7	PROGRAM Type 8
1–	8:00	8:00	9:00	RHYTHM MELODIES			REC	E
2–				James Brothers	60	CM		
3–				XYZ Laundry	60	CM		
4–				Alan Tires	60	CM		
5–				~~ABC Ice Cream~~	~~30~~	~~CM~~		
6–				Red Cross		PSA		
7–				Sureway Food	60	CM		
8–				Stop-Start Driver Training School	60	CM		
9–				Shady Hill Summer Theatre	60	CM		
10–		8:30	8:35	NEWS HEADLINES - Country Journal	1:30	CM	L	N
11–				John's Donut Shop	60	CM		
12–				Blackacre Real Estate	60	CM		
13–				Wright Insurance	60	CM		
14–				Rong Shoe Store	60	CM		
15–	9:00	9:00	9:14	JOE SMITH DEM. County Democratic Com.			L	PA-POL
16–				Cosmo Drugs	30	CM		
17–		9:15	9:28	FARM REPORT Coles' Tractor Co.	3:00	CM	L	A
18–		9:29		Announ. per Sec. 73.1202				
19–		9:30	9:59	LITTLE ORPHAN PUNJAB			MBS	
20–				Frank's Carpet Center		CM		
21–	10:00	10:00	10:29	LITTLETOWN LIBRARY TOPICS			L	I-ED
22–				Petite Clothes	60	CM		
23–		10:30	10:44	HEAVENLY MOMENTS - Coun. of Churches			L	R
24–				Lehi Beverage Co.	~~30~~ 60	CM		
25–		10:45	10:59	MAN ON THE STREET Ford's Used Cars	3:00	CM	L	PA
26–				John's Garage	60	CM		
27–	11:00	11:00	11:24	Coca Cola Melodies	3:30	CM	REC	E
28–				Tony's Pizzeria	60	CM		
29–		11:25	11:29	MORNING HEADLINES			L	N
30–				Sta. Promo - Sports Windup (Schmaltz Beer)	10	CM		
31–		11:30	11:59	JOHN'S OTHER LIFE			MBS	
32–				Ray Hay Rep. Back Hay Com.	20	CM		
33–				Weekday Religious Education		PSA		
34–	12:00	12:00	12:14	MID-DAY NEWS			MBS	
35–		12:15	12:30	AIR FORCE TUNE TIME			REC	E
36–				Air Force Recruiting		PSA		
37–				Air Force Recruiting		PSA		

On	9. Operator or Announcer	Off 9:00	On 9:00	9. Operator or Announcer	Off
On	9. Operator or Announcer	Off	On	9. Operator or Announcer	Off

Comments: ABC Ice Cream spot was not run during Rhythm Melodies and log-keeper forgot to delete entry. *Bob West, Program Manager WXXX* 7/17/80

Figure 14–2 (National Association of Broadcasters)

Times, Program, and Station Identification

The first column on the log indicates the time of station identifications (ID). Station identifications are required when the station begins and ends its programming day. Sometimes stations are forced off the air unexpectedly, such as when lightning strikes the antenna. The minute they return to the air, they must broadcast an ID and make a notation in the "Remarks" section of the interruption. Station identifications must also be broadcast "hourly, as close to the hour as feasible, at a natural break in the program."[2] Some exceptions are permitted. If a station is broadcasting a symphony orchestra concert, interrupting with a station ID would not exactly thrill the serious listener. In these cases, IDs can be given as close to the hour as possible but at a natural break in the programming, such as at intermission or at the end of a particular selection.

A station ID must ~~consist of the~~ call letters and the name of the community served by the station. Television stations also must announce their channel. The station may insert the name of its licensee between the call letters and the community, such as "This is WXXX, Tower Broadcasting, in Anytown." But that is the *only* fact that can be inserted. Additional information can be added before and after the mention of the call letters and the community, such as "At 1410 on your dial, this is WXXX in Anytown, the voice of the Wabash Valley."

The FCC also prohibits stations from "inflating" their primary service area by substituting a town in the ID other than the one to which the licensee is assigned. For example, a Newark, New Jersey station could not announce "This is WXXX serving greater New York City." Even though Newark is across the river from New York and might be heard in New York, it is still *licensed* to Newark. Thus, the word *Newark* must be used with the call letters.

This does not mean that all announcements must avoid reference to their larger metropolitan area. For example, if our hypothetical station in Newark could show that its broadcast contour actually covered New York City, then it could identify itself as "This is WXXX, Newark, serving the greater New York City area." Notice, however, that the city of license was mentioned in conjunction with the call letters. In addition, when the FCC has licensed a station for dual-city designation, then the name of both cities can be announced in the order that they are listed on the station's license. This occurs in such twin cities as "This is WXXX, Minneapolis-St. Paul."

Classifying Programming: Type and Source

The next two columns on the log are the begin and end times of a program. Examine line 10 and column 4 of our sample log. The program title is NEWS HEADLINES. We can tell from column 2 that the program started at 8:30 and ended at 8:35. Column 4 also tells us that the sponsor for "News Headlines" is *Country Journal.* Logs require identification of the program and its sponsor(s). To distinguish the program from the sponsor, we have typed the program in capital letters and the sponsor in lower case letters.

Column 6 lists the actual duration of the commercials. For example, we can see by examining line 10 and column 6 that *Country Journal* commercials ran for 1 minute and 30 seconds during "News Headlines." This might have occurred as one 60-second and one 30-second commercial. Most commercial announcements run in ten-second multiples. The short, 10-second ones are often promotional announcements, reminding listeners, for example, that a grand opening is taking place or a special sale will start next week. Although 30- and 60-second announcements have been popular with most sponsors, the recent high costs of advertising time on radio and television have made the 10- and 20-second commercials a hit.

Another important part of the log is a listing of the commercial type, found in column 6. Most of the announcements in our sample log are listed as CM, which, by consulting the top of the log, we see stands for commercial matter. Another common symbol is PSA, standing for Public Service Announcement. In examining line 36 and column 6, we see that a PSA is logged for Air Force Recruiting. Stations are required to make available a certain amount of time for airing PSAs. These are free to whatever nonprofit organization is fortunate enough to receive the time. Although our example was for a national organization, local, nonprofit organizations in the station's home community also qualify for public service time.

Column 7 on our sample log lists the program's source. Three main categories of source are used by the FCC—local, network, and recorded. Letters are used to abbreviate the source with a network abbreviation often identifying the actual network. In our sample log, line 34 and column 7 tell us that the program originated from the Mutual Broadcasting System (MBS). The FCC defines these sources as:

1. *Local:* Any program originated or produced by the station, or for the production of which the station is primarily responsible, employing live talent more than 50% of the time. Such a program, taped or recorded for later broadcast, shall be classified as local. A local program fed to a network shall be classified by the originating station as local. All non-network news programs may be classified as local. Programs primarily featuring records or transcriptions shall be classified as recorded (REC) even though a station announcer appears in connection with such material. Identifiable units of such programs which are live and separately logged as such may be classified as local (e.g., if during the course of a program featuring records or transcriptions, a non-network two-minute news program is given and logged as a local news program, the report may be classified as local).
2. *Network* (NET): Any program furnished to the station by a network (national, regional or special). Delayed broadcast programs originated by networks are classified as network.

3. *Recorded* (REC): Any program not otherwise defined, above, including, without limitation, those using recordings, inscriptions or tapes.[3]

In our sample log, we can see on line 10, column 7 that "News Headlines" is logged as local (L) since it was produced by the station and used live talent. Line 1, column 7 shows "Rhythm Melodies" logged as recorded (REC). Even though the disc jockey might make announcements during the program, the program consists primarily of recorded material in the form of records.

Column 8 refers to program types. This is the most complex of all the logging requirements because of the wide variety of programming types available. Programming types fall into one of the following FCC categories:

Agricultural Programs (A) include market reports, farming or other information specifically addressed, or primarily of interest, to the agricultural population.

Entertainment Programs (E) include all programs intended primarily as entertainment, such as music, drama, variety, comedy, quiz, etc.

News Programs (N) include reports dealing with current local, national, and international events, including weather and stock market reports; and, when an integral part of a news program, commentary, analysis, and sports news.

Public Affairs Programs (PA) include talks, commentaries, discussions, speeches, editorials, political programs, documentaries, forums, panels, round tables, and similar programs primarily concerning local, national, and international public affairs.

Religious Programs (R) include sermons or devotionals; religious news; and music, drama, and other types of programs designed primarily for religious purposes.

Instructional Programs (I) include programs other than those classified under Agricultural, News, Public Affairs, Religious or Sports involving the discussion of, or primarily designed to further an appreciation or understanding of, literature, music, fine arts, history, geography, and the natural and social sciences; and programs devoted to occupational and vocational instruction, instruction with respect to hobbies, and similar programs intended primarily to instruct.

Sports Programs (S) include play-by-play and pre- or post-game related activities and separate programs of sports instruction, news or information (e.g., fishing opportunities, golfing instructions, etc.).

Other Programs (O) include all programs not falling within other definitions.

Editorials (EDIT) include programs presented for the purpose of stating opinions of the licensee.

Political Programs (POL) include those which present candidates for public office or which give expressions (other than in station editorials) to views on such candidates or on issues subject to public ballot.

Educational Institution Programs (ED) include any program prepared by, in behalf of, or in cooperation with, educational institutions, educational organizations, libraries, museums, PTA's, or similar organizations. Sports programs shall not be included.[4]

Program-type loggings become very important at license renewal time. Each station must submit logs for a composite week of broadcasting as part of its renewal application and must determine the percentages of programming on those logs devoted to each programming type. These then are compared by the FCC to see if the station did devote the time to programming types that it "promised" in its previous license renewal.

A program log also tells us who the board operators were and what time they signed on and off the log. Under the section marked *Comments*, we can see a program change for ABC Ice Cream that was written in by the program manager. On line 5, we can see a correction has been listed. In this case, the commercial for ABC Ice Cream did not air. If a correction is made while the operator is on duty, all that is necessary is to draw a single line through the entry. If the correction is made after the operator signs off the log, then a special notation must be made in the comments section, and be dated and signed by either the operator who made the correction, or a representative of the licensee, the general manager, or the program director. Some stations have started using a special statement at the bottom of each log adjacent to the operator's signature, similar to, "I hereby certify that this log is an accurate and true representation of that material broadcast during the period I was on duty as a station operator."[5]

operating logs

Besides logging broadcast programming, FCC regulations require that logs be kept for the operation of the station's transmitter.[6] This includes regularly scheduled monitorings of power output, voltage measurements, and such operating functions ~~as monitoring tower lights. Our~~ discussion will be confined to the ~~very simplest operating~~ logs, those for standard radio-br~~oadcast stations. More complex~~ logging is required for television stations and directional radio stations.

Figure 14–3 illustrates a basic operating log for an AM radio station. Like the programming log, it contains the station's call letters, its location, the date, and the city and state of its license. The time of each entry is logged in the left column. The person making the entry must be licensed by the FCC. We shall learn more about licenses later in this chapter, but for now keep in mind that whereas programming logs may be kept by people who do not have an FCC license, operating logs may not. As with programming logs, operating logs must be legible and must be available for inspection.

For an AM or FM station with no special logging requirements, an operating log is rather simple. Besides those for the time of the entries are columns for three "power" readings affecting the operation of the transmitter. Although it is not important at this point to understand the precise meaning of these terms, they include the plate current (column 2) the plate voltage (column 3), and the antenna current (column 4).

WXXX-AM

TRANSMITTER OPERATING LOG

12-KILOCYCLES:

5 KW

DATE ________________ 19___

Anytown, U.S.A.

1	2	3	4	
TIME	PLATE CURRENT FINAL STAGE	PLATE VOLTAGE FINAL STAGE	ANTENNA CURRENT Amperes	REMARKS:

Figure 14–3 (National Association of Broadcasters)

Although not shown in our figure, the operating log also has spaces to note the times the carrier (power to the antenna) is turned on and off at the beginning and end of the broadcast day, and spaces for the licensed operators to sign on and off the log.[7] Additional information requested from most AM and FM stations includes the time the tower lights are turned on and off, the time they are checked daily for satisfactory operation, and if a light is extinguished for malfunctions.

Different modes of operation for certain stations also must be logged. A *mode* can best be defined as *a particular combination of transmitter, operating power and antenna pattern.* Consider the following example: "If an AM station is operating at 1,000 watts with a nondirectional antenna, that is its mode of operation. If it reduces its power to 250 watts and changes to a directional pattern at sunset, that is a different mode of operation. If it shifted from a main to an alternate transmitter at midnight, that is a third mode, and if at 6:00 A.M. . . . it increased power to 500 watts, that is a fourth mode of operation."[8] Remember, any change in the mode of operation must be entered in the operating log.

the public inspection file

As the trustee of the public domain, ~~broadcasting stations~~ are required by law to ~~keep certain~~ documents and information open for public inspection. This means members of ~~the general public are~~ entitled to documents from the file. A station may be visited any time during normal business hours, and although the station has the right to ask for personal identification, you should not be "interrogated" about your motives for wanting to see the file. If you would like certain documents copied, then the station can charge you a reasonable fee to have the material reproduced.

What is contained in the public file varies somewhat among different types of stations—AM, FM, and TV as well as noncommercial versus commercial stations. So be sure the station is required to keep a certain document before you request to see it. Your best bet in this instance is to consult the FCC rules. Our discussion of public files will be general, and remember, it varies from station to station.

A public file contains technical information directly related to the construction and daily operation of the station. Construction permits, major changes in frequency, output power, a change in station location or the transmitters are typical inclusions. Do not expect to find minor technical information, such as pointers on the new antenna support wires, information about a new control board, or information about the new record racks. If a new construction permit has been granted, and the FCC grants an extension of the permit, the extension is in the public file. The file also will include correspondence related to these changes. A copy of the station's coverage area (contour maps) should be there, as should reports listing the ownership of the station, and any FCC decisions arising from a hearing on the station's license renewal. A copy of the license renewal and the logs submitted as part of the renewal's "composite week" should also be available.

Politicians will be interested in examining the file's political documents. Most of what a station does in the way of political programming is an open book to the public, including the candidates and their opponents. Requests for political time by legally qualified candidates, a record of what was done with the request, and the rate charged for that time are kept for two years from the date of request. The spirit of the law behind the political file is to keep access to the airwaves open to any and every legally qualified candidate. It prevents an unscrupulous broadcaster or politician from claiming that a candidate has not talked with the station nor has bought any advertising, thus discouraging an opponent from buying time when in fact the candidate has purchased and aired a series of political commercials.

Other information in the file includes the FCC procedural manual, *The Public and Broadcasting,* and copies of letters from the public unless they are obscene or the sender specifically requests that they be confidential. Letters of little importance to the station, such as love letters to a movie star or fan mail for the local anchorperson, may be absent. What should not be missing is a copy of the latest listing of problems affecting the community as determined from the community needs and ascertainment survey.

Although not considered part of the public file, program logs or copies of them are open for public inspection, beginning 45 days after the date on the log. The requirements for viewing program logs are stricter. You will need to make an appointment, identify who you are and whom you represent, why you want to see the logs and, if you are part of a large group of people wanting to view the logs, the station may limit the number of people viewing them. You can obtain copies of the logs but probably will be asked to pay for reproduction. You will be given a reasonable time to inspect the logs, but if you want to come back again, the station may charge you for the time necessary for personnel to supervise your efforts.

community needs and ascertainment surveys

Before public or commercial broadcasting stations can be granted an operating license, have that license renewed, or even continue to operate while the license is in force, it must conduct regular surveys of the problems facing its community and direct its programming to meet the needs of those problems. These community needs and ascertainment surveys are another means of obtaining feedback from the broadcasters' communities. They can be quite detailed, depending on the size of the station's market. Their importance cannot be overlooked, considering that such surveys have been used as evidence in license challenges.[9]

The guidelines broadcasters follow in conducting the community needs and ascertainment surveys were first spelled out in the *Primer on Ascertainment of Community Problems* issued by the FCC in 1971.[10] Further clarifying those guidelines in 1975, the FCC added noncommercial broadcasting stations to the list of those required to conduct the surveys.[11]

The ascertainment process has three parts, the first of which is a *demographic profile.* After checking census data, the broadcaster determines the population of the community served by the station, the percentage of males and females in the population, the percentage of minorities, the percentage of older people (over 65), and the percentage of youths (under 17). This demographic profile shows the broadcaster what proportion of people will provide a good cross section of information about the community's problems. For example, if the demographic profile shows that 30 percent of the residents are over 65 years of age, yet only 5 percent of the station's general public survey consists of older people, the broadcaster will need to conduct additional interviews with this population. Although the FCC has avoided requiring broadcasters to match their survey precisely with the demographic profile, the profile does act as a guide.

The second part of the community needs and ascertainment survey is *community leader interviews.* Here the broadcaster interviews the leaders of different elements in the community. The FCC has established a general list of community elements from which the community leaders can be drawn:

1. Agriculture
2. Business
3. Charities
4. Civic, neighborhood, and fraternal organizations
5. Consumer services
6. Culture
7. Education
8. Environment
9. Government (local, county, State and Federal)
10. Labor
11. Military
12. Minority and ethnic groups
13. Organizations of and for the elderly
14. Organizations of and for women
15. Organizations of and for youth (including children) and students
16. Professions
17. Public Safety, health, and welfare
18. Recreation
19. Religion
20. Other

If you were the general manager of a radio or television station and were interviewing people who represented your community's educational elements (7), you might interview the local college president or administrators and perhaps some professors. You might also interview local school board members, the principal of the local high school, the principal of the local elementary schools, teachers, and officers in the local parent-teacher organizations. How many of these community leaders you interviewed would depend on the size of your community. A good rule-of-thumb would be the following combinations suggested by the FCC:

Population of City of License	*Number of Consultations*
10,001 to 25,000	60
25,001 to 50,000	100
50,001 to 200,000	140
200,001 to 500,000	180
Over 500,000	220

Although you would probably conduct more community leader interviews, the FCC expects stations to fulfill at least these minimum requirements.[12] The community leaders must be contacted by station management or personnel under direct management supervision. You would need to keep track of how many women and minority community leaders you contacted, the recommendation being that those interviews be conducted directly by management-level personnel.[13]

You also would need to place in the station's public file the (a) name and address of the community leader; (b) institution or element he or she represents; (c) date, time, and place of the interview; (d) problems, needs, and interests discussed (although the leader can request that this information be confidential); (e) name of the person who conducted the interview (if the interviewer was a supervised person, the name of the management-level person who reviewed the interview report); and (f) the date the report was reviewed.

The third phase of ascertainment would be the *general public survey.* Here you need to select a random sample of the community. You would interview each person in that sample either in person, by telephone, or by mail.[14] Whatever method you chose, you would want not only to find out their opinions about the community, but also obtain their demographic characteristics. Again, the information in your demographic profile would be your guide, and you would want to match this as closely as possible to be sure you had a representative cross section of the general public.

You would probably ask one of two types of questions—open-ended or close-ended (Figure 14–4). Open-ended questions permit the greatest flexibility in their answer.[15] Consider the following: *What do you feel is the most important problem facing our community?* The person answering this open-ended question has many choices. Now consider this close-ended question: *Is there a problem with public transportation in the community? Yes*☐ *No*☐. The only acceptable answer is either yes or no. The advantage of the open-ended question is its less restrictive nature. Its disadvantage is

Figure 14–4 (Corporation for Public Broadcasting)

11.	ARE THERE PARKING PROBLEMS?	______YES______NO
12.	IS THERE A PROBLEM WITH URBAN DEVELOPMENT?	______YES______NO
13.	IS THERE A PROBLEM WITH POLICE PROTECTION?	______YES______NO
14.	IS THERE A HOUSING PROBLEM?	______YES______NO
15.	IS CRIME A PROBLEM?	______YES______NO
16.	IS POPULATION A PROBLEM?	______YES______NO
17.	ARE THERE WELFARE PROBLEMS?	______YES______NO
18.	IS THERE A PROBLEM WITH ELECTRIC UTILITIES?	______YES______NO

the difficulty in tabulating the various answers. Whatever questions you decide to ask, you would then conduct the survey and organize your results, ranking in importance those problems affecting your community.

license renewal

Standard ~~AM, FM, and~~ TV stations are licensed by the FCC. Each license is va~~lid for three~~ years. The license, also called *station authorization* or *instrument ~~of authorization,~~* specifies the ~~authorized power of the~~ station, its ~~hours of operation~~, the brand name ~~and model of~~ the transmitter and ~~the antenna~~, the location of the ~~transmitter, the latitude~~ and longitude of ~~the antenna, and the name and address of the licensee.~~ Television and AM licenses contain such additional information as directional antenna patterns or video transmission frequencies. The expiration date is coordinated to expire along with all other stations' licenses in the state.

A license is the single most important document the station possesses. Every three years, the station applies to renew that license and continue operating. The license renewal is essentially a forecast of what the station will do over the next three-year period in terms of entertainment and commercial programming, news and public affairs broadcasting, affirmative action, and in other specific terms required by the FCC. Once forecasted, the station must adhere to those predictions. Although the exact application procedures are slightly different for radio and television and for commercial and noncommercial broadcasting, we'll examine a typical radio-license renewal form, Form 303-R, commonly called the short form.

Parts I through III: General Information, Legal, Engineering

Part I of Form 303-R asks for general information, including the name of the applicant and an address to which communication regarding the the renewal application should be sent, because the person handling the renewal may not be at the station, as in the case of absentee ownership or central offices handling renewals for their group of stations. The second section of Part I requires the call letters, frequency and channel,[16] power, hours of operation, location of the station, and whether renewal is requested for subsidiary communication authority. SCA, as you remember, is the subcarrier frequency used, among other things, to pipe music into businesses or restaurants.

Part II is the "legal" part of the renewal. The commission wants to see a copy of the station's ownership report, and in item 5 of Part II asks if "the applicant is in compliance with the provisions of Section 310 of the

Communications Act ... relating to the interests of aliens and foreign governments." Section 310 prohibits licensing a broadcast station to:

> *Any corporation of which any officer or director is an alien or of which more than one-fifth of the capital stock is owned of record or voted by aliens or their representatives or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country.*

Guarding against the threat of monopoly, item 6 of Part II checks to see if the applicant owns other media outlets, and item 7 of Part II examines the applicant's qualifications. A licensee convicted of a felony or other unlawful activities can make a license renewal difficult, if not impossible. The commission wants full details of any convictions or charges including "identification of the court or administrative body" handling the proceedings. Part III of the renewal application is on engineering and is verified by the station's technical director, the chief operator, consulting engineer, or a registered professional engineer.

Parts IV and V: Programming and Equal Employment Opportunity

Part IV is one of the most important sections. Here the FCC examines a station's community ascertainment efforts, its community leader checklist, and the percentages of different types of programming, down to the minute.[17] The FCC carefully studies what was promised in the previous application, how well the station met those promises, and what is promised for the next three years. More than any other part of the license renewal, failure to perform as promised will place the application in serious trouble.

The FCC also wants to see if the applicant stayed within the acceptable 18 minutes of commercial time per hour[18] and the percentage of programming which may be duplicated with other stations, such as a simulcast by an AM and FM station licensed to the same applicant. The 18-minutes-per-hour guideline is just that, a guideline. License renewal applications containing more than 18 minutes of commercial time an hour for radio and more than 16 minutes for television receive close scrutiny to determine if they are operating in the public interest. But the FCC has no power to dictate the amount of commercial time, since that would violate the anticensorship provision of the Communications Act. This license-renewal process, however, generally "encourages" stations to stay within acceptable commercial limits. Part IV concludes with item 22, for additional information, permitting the applicant to call to the FCC's attention anything else that may reflect on its qualifications for renewal.

A separate section of Part V deals exclusively with the station's affirmative-action program. Item 23 of Part V notes the model, 10-part affirmative-action program, and item 24 informs the FCC of any affirmative-action complaints brought against the station as well as the status of those complaints. Serious, unresolved affirmative-action issues can provoke the issuance of a short-term license renewal, and although broadcasters cannot be threatened by unwarranted complaints, blatant disregard for affirmative-action policies can spell trouble.

The quickest way to have a license revoked is to lie on the renewal application. Not only will the station face license revocation, but the United States Criminal Code also provides for additional penalties. For most broadcasters, responsible operation of a broadcasting station on a daily basis turns a license renewal into almost a routine procedure.

crossownership

Although many broadcasting stations are profitable ventures, ownership is regulated by the FCC to avoid monopolies. The FCC rules include (1) the seven-station rule, (2) the duopoly rule, (3) the one-to-a-market rule, (4) the regional concentration-control rule, and (5) the newspaper-broadcast ownership rule.

Seven-Station, Duopoly, and One-to-a-Market Rules

One of the most inflexible rules is the seven-station rule. It prohibits an owner from having more than seven stations of any one type—AM, FM, or TV. Thus, a total of 21 stations is permitted to the same owner. Only five of the TV stations can be VHF. The duopoly rule prohibits crossownership when two stations of the same type (such as two AMs) have certain overlapping contours.[19] Directly related to the duopoly rule is the one-to-a-market rule which prohibits a radio-TV crossownership in which certain contours of the radio and television station overlap. An owner can operate an AM/FM combination in the same market.

Regional-Concentration Rule

Guarding against a monopoly of viewpoints over what the public receives in any given area, the FCC prohibits regional concentrations of ownership. To understand the regional-concentration rule, imagine an owner with three stations in three different markets. In drawing a triangle connecting the three markets, we discover that one side of the triangle is 100 miles long. If this is the distance, and the primary contours of any of the stations overlap on any side of the triangle, the crossownership component is illegal. Naturally, when the stations were purchased or started, the FCC would have prohibited the concentration in the first place. Thus, finding an illegal crossownership is highly unlikely. The regional-concentration rule also is applied frequently when an owner wants to increase the power of one of the stations. Even though the owner may be within legal limits operating the stations less than 100 miles apart, increasing the power of one of the stations may result in the contours overlapping on one side of the triangle; thus, the power increase would place the station in violation.

Newspaper-Broadcast Crossownership Rule

If the seven-station rule were considered the most inflexible, the newspaper-broadcast crossownership rule could be considered the most controversial. The controversy surfaced in 1977 when the U.S. Court of Appeals in Washington, D.C. ruled against an FCC policy of not requiring long-standing newspaper-broadcast crossownerships to be dissolved but prohibiting certain new ones from being formed.[20] Brought to the court by the National Citizens Committee for Broadcasting, the case placed hundreds of millions of dollars of crossownerships at stake, leaving an appeal to the U.S. Supreme Court the only alternative for over 150 newspaper-broadcast crossownerships. Except when there was a clear indication that the public interest would be harmed if the newspaper-broadcast ~~crossownership continued to exist, the~~ FCC permitted those crossownerships ~~to stand. The~~ appeals court took an opposite view to the long-standing FCC policy. Refuting the rationale of allowing existing crossownerships to continue, the appeals court said: "We believe precisely the opposite presumption is compelled, ~~and that~~ divesture is required except in those cases where the evidence clearly discloses that crossownership is in the public interest."

Although buying and selling stations will continue, both FCC and court rulings have made it clear that owners can have no more than their share of properties and that the public interest will be served even if it means prohibition and disruption in the broadcast industry.

starting a new station

For those who can find the market and frequency available, starting a station from scratch is still an attractive venture. Although the job is complex and the competition for a new station in a multistation market substantial, many still try it and succeed.

Preliminary Steps

The first step in starting a new station is to find an area in which a frequency is available. For an AM radio station, the search will mean not only consulting the engineering data of stations already in the market, but also having a qualified engineer conduct a frequency search. The frequency search entails checking the exact broadcast contours of stations currently serving the area and determining what type of signal will not interfere with those already operating. Thus, researching possible wattage, contour patterns, and available frequencies all must proceed the application process.

FM radio and TV starts are a bit different. An applicant for an FM radio license either must select an available frequency already assigned by the FCC to the area in which the applicant wants to operate or a place within a specified radius to which no FM frequency has been assigned. TV applicants must request a UHF or VHF channel assigned either to the community or to a place in which there is no channel assignment within 15 miles of a community.

Once the frequency search has been completed, the next step is a community needs and ascertainment survey. We already learned about these surveys earlier in this chapter.

Construction Permit to License

When the community needs and ascertainment survey is completed, the applicant applies to the FCC for a construction permit. The applicant also must have the financial capability to operate the station for at least one year after construction. Notice of the pending application must be made in the local newspaper, and a public inspection file must be kept in the locality in which the station will be built. Once filed with the FCC, others can comment on the application or, in the case of competing applicants, file against it. If necessary, the FCC will schedule a hearing on the application. Following the hearing, the FCC Administrative Law Judge will issue a decision which can be appealed.

If everything in the application is found satisfactory, and there are no objections, the FCC then issues the construction permit. Construction on the station must begin within sixty days after the date the construction permit is issued. Depending on the type of station, a period of up to eighteen months from the date the construction permit is issued is given to complete construction. If the applicant cannot build the station in the specified time allotted, then the applicant must apply for an extension in time.

After the station is constructed, the applicant then applies for the license. At this time, the applicant can also request authority to conduct program tests. These tests will usually be permitted if nothing has come to the attention of the FCC to indicate the operation of the station would be contrary to the public interest. When the license is issued, the station can go on the air and begin regular programming.

Although the procedure is somewhat systematic, putting the station on the air is anything but simple. The paperwork, dealing with engineers and communication attorneys, and securing the financing necessary not only to buy land and equipment but also to keep the station running for a year all can be difficult and time-consuming. If objections or competing applications become an issue, the court costs can discourage an applicant from completing the application process. Still, for those who do succeed, the rewards can be substantial, both in personal satisfaction and income.

summary

Program logs are an important part of every station operation. The FCC requires, among other information, that the station note the times of programs and station identifications and log all programming according to specific program categories. These include: agricultural programs, entertainment programs, public affairs programs, religious programs, instructional programs, sports programs, and other programs which do not fall into any other category. In addition, editorials, political programs, and educational institution programs also must be logged. Operating logs are also required and concern the technical operation of the station, such as the output of the transmitter and such things as antenna lighting and periodic inspections by qualified licensed engineers.

So the public can readily inspect the ability of the station to serve the public interest and additional information about station operations, stations also must maintain a public inspection file. Most stations must also conduct regular community needs and ascertainment surveys which become part of the station's public records as do license renewal applications. Such surveys require management to consult a cross section of the community, then to draw up a list of specific problems facing the community and how the station programming is directed to these problems. The FCC and the courts have established regulations on the number of stations that can be owned by the same firm or individual in a given market.

Crossownership has been an important issue in broadcast regulation, not only in the operation of stations already on the air but also of stations just starting. The courts have continually moved toward breaking up multiple ownership, and many owners have had to sell one or more of their broadcasting properties. The FCC has also established guidelines that stations must follow when constructing new or altering old facilities.

spotlight on further learning

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15

cable, satellites, and future perspectives

FOCUS After completing this chapter we should be able to

Define the terms *cable system*, *cable television system community unit*, and *subscriber*.

Explain carriage exclusivity.

Understand the concept of state regulation of cable.

List the major responsibilities of the FCC as found in the Communications Satellite Act of 1962.

Grasp the human implications of satellite communication.

Trace the early support in Congress for rewriting the Communications Act of 1934.

Identify the major provisions which could occur in a Communications Act rewrite.

Although traditional broadcasting stations have always been under the control of federal agencies, new technology such as cable and satellites also have not been exempt from government regulation. With the beginning uses of microwaves to link cable systems, the FCC gained early court approval for control over cable systems. This control is shared with local communities and even states. It is the one area of broadcasting in which a single cable system can find itself faced with regulations from three different levels of regulatory authority: local, state, and federal. Satellite communication has also come under government scrutiny and has become directly involved in international issues such as cooperative and peaceful uses of space. With all of these changes in technology, including but not limited to satellites and cable, it is not surprising that Congress is having serious discussions on overall communications legislation. Efforts in both the U.S. House of Representatives and the Senate are directed toward rewriting the basis of the Communications Act of 1934 and replacing it with what some people feel would be a more up-to-date document. In this chapter we shall examine regulation of cable and satellite communication as well as proposals to rewrite the Communications Act.

regulating cable

In writing about cable television, Lee Loevinger noted, "Each new development of man's inventive genius is a threat to the timid and the indolent and an opportunity to the bold and enterprising. For the pessimist, the golden age is always in the past; for the optimist, it is in the future."[1] The regulatory background of cable television has alternated between the pessimist and the optimist, and the timid and the bold. From cable's beginnings in the late 1940s to its new technology of two-way communication in the 1970s and 1980s, many forces have been at work.

The FCC began exercising its authority over cable in 1962. In 1965, the commission established rules governing cable systems that received signals by microwave. A year later, the FCC added rules and regulations for cable systems not using microwave. Knowing a court case would soon test its authority to regulate cable, the FCC decided to prepare for the inevitable when it issued a decision limiting the ability of a San Diego, California cable system to import signals from Los Angeles. The test came in *United States* v. *Southwestern Cable Co.* in which the Supreme Court upheld the FCC's right to regulate cable as part of its mandate under the Communications Act to regulate "interstate commerce by wire or radio."[2] By 1968, the FCC had started an official rule-making proceeding to develop comprehensive regulations for cable, which it finally issued in 1972. In the midst of all of this, cable came under the aegis of not only the federal government but state and local governments as well. In examining cable regulations, we shall begin by exploring the FCC's definition of cable, local franchise requirements, and service to the public. Finally, we shall examine the people in the middle of cable regulation—the state authorities.

Definitions

To understand cable regulations, we first need to understand some cable definitions.[3] The FCC defines a *cable television system* as a "nonbroadcast facility consisting of a set of transmission paths and associated signal generation, reception, and control equipment that distributes or is designed to distribute to subscribers the signals of one or more television broadcast stations." The location of the cable television system is called the *cable television system community unit,* which is defined as "a cable television system, or portion of a cable television system operating within a separate or distinct community." The person receiving the cable system's services is the *subscriber,* defined by the FCC as a "member of the general public who receives broadcast programming distributed by a cable television system and does not further distribute it." The FCC points out that for regulatory purposes, these definitions do not include cable systems operating with less than 50 subscribers or multiple-unit dwellings.

Our discussion of cable regulations will be general rather than specific. The complexities of regulations affecting different communities and cable systems are written in difficult legal and technical terminology. However, if you are interested in the regulations will be general rather than specific. The complexities of regulations affecting a particular cable system, then you should obtain a copy of the latest cable regulations from the FCC. Always consult an attorney familiar with communication law should you desire precise interpretation of a rule.

Local Franchise Structure

The foundation of many cable regulatory concepts is found at the local level. Unlike over-the-air broadcasting, cable can be regulated by its local community, which has the authority to place certain service and operational requirements upon it, to levy fees, and to determine community-access channels. Types of local control vary considerably. Professor Vernone Sparkes studied these different types and classified them into five agency organizations. The first is an *administrative office,* in which the local government establishes a regulatory agency much like the FCC. It might be found in the mayor's office or the city planner's office. A second type is the *advisory committee* which can be appointed by the mayor or the city council and "advises" city government on cable regulation. Closely related to the advisory committee is an *advisory committee with administrative office*, which "combines an appointed advisory committee with a full-time salaried executive office." Sparkes points out that the executive usually works independently from the advisory committee, with the latter advising the city council on policy matters. A fourth organization calls for the creation of an *independent regulatory commission*, which administers and participates in rule making. A fifth plan provides for *elected boards* answering to the electorate on cable regulations rather than to another elected body.[4]

Local Franchise Registration Requirements

A license is not required to operate a cable system, but the FCC has established some registration procedures. Cable systems beginning operation must notify the commission of such facts as the legal name of the cable operator; the identification of the entity operating the system; whether the operator is an individual, private association, partnership, or corporation; and the legal name of the individual responsible for communicating with the FCC. Such data as the mailing address, date the system reached fifty subscribers, names of communities served, signals to be carried on the system, and certain employment reports must also be filed, including a statement of the proposed equal-employment opportunity program. When this information is complete, the commission announces the filing in a public notice. Smaller systems contemplating operation with between 50 and 1,000 subscribers have somewhat different registration requirements.

FCC Recommendations for Local Franchises

Although the FCC keeps a regulatory distance between itself and local communities engaged in awarding cable franchises, the commission has established *recommended* franchise standards for communities, as follows:

(1) The franchising authority should approve a franchisee's qualifications only after a full public proceeding affording due process.

(2) Neither the initial franchise period nor the renewal period should exceed fifteen years, and any renewal should be granted only after a public proceeding affording due process.

(3) The franchise should accomplish significant construction within one year after registering with the commission and make service available to a substantial portion of the franchise area each following year, as determined by the franchising authority.

(4) A franchise policy requiring less than complete wiring of the franchise area should be adopted only after a full public proceeding, preceded by specific notice of such policy.

(5) The franchise should specify that the franchisee and franchisor have adopted local procedures for investigating and resolving complaints.[5]

The FCC also advises the local franchisee to adopt a local complaint procedure, identify a local person to handle complaints, and specify how complaints can be reported and resolved.

Sensitivity to the Public

Meeting these franchise standards is not the end of a cable system's responsibilities. It still must be sensitive to its public. Complaints can always be filed with the FCC, the cable company, and local and state authorities. In addition, a special FCC Cable Complaint Service operates in Washington, D.C., as part of the Cable Television Bureau. Its functions include: "(1) attempting to clear up misunderstandings between subscribers (and/or state and local governments) and cable systems with regard to Commission rules; (2) dealing with complaints about a system's service; and (3) helping local governments to structure complaint procedures."[5] Local franchisees are encouraged by the FCC to adopt some form of local complaint procedure, identify a local person who will handle complaints, and notify new subscribers who this person is.[6]

Carriage Requirements

In servicing a community, a cable system faces certain requirements of what it can and cannot carry on its cable channels. Again, standards differ from community to community, and you should check the rules which apply to your area. The requirements are usually based on the size of the system, with systems of fewer than 3,500 subscribers free from some of the controls imposed on larger systems. For most cable systems, however, the service requirements are broken down into two areas: (1) "must carry" signals which are signals the cable system is required to carry at the request of a television station and; (2) "may carry" signals which are signals permitted on the system after the "must carry" signal requirements are met.[7] The new two-way cable services are being evaluated to see how they affect these current signal requirements.

The "must carry" generally entails carrying the signals of all television stations licensed to communities within thirty-five miles of the cable system's community. If a noncommercial television station's grade B contour (signal) covers the community, then the cable system is also required to carry that signal. By using the B contour as the criterion, all stations whose A contours touch the cable system are automatically covered, since the A contour falls inside the B. As we learned earlier, some stations boost their signal over wide geographic areas by using translator stations which receive and retransmit the programming from the main television transmitter. Thus, if either a commercial television translator station with at least 100 watts of power or a noncommercial translator station with at least 5 watts of power serves the community, then the cable system is required to carry those translator stations' signals.

Stations that are significantly viewed in the cable system's home community must also be carried. The term "significantly viewed" is defined by the commission as network stations with a minimum 3 percent share of viewing hours and 25 percent net weekly circulation. For independent stations, the criterion is a minimum 2 percent share and 5 percent net weekly circulation. In addition, cable systems in certain small markets must carry all stations from other small markets whose grade B contour covers the cable system's community.

Additional "must carry" requirements apply to those cable systems located in communities outside of a television market, such as a sparsely populated area of the country. In those communities, the cable system is required to carry all stations whose grade B contours cover the community in which the cable system is located, stations which are significantly viewed in the cable system's community, and all educational stations licensed to communities within thirty-five miles of the cable system's community. In addition, the system must meet the carriage requirements for translator stations mentioned earlier.

The "may carry" requirements are based on certain combinations of stations. Keep in mind that all television markets in the United States are ranked by the FCC according to their size. These market rankings are then the basis for "may carry" requirements. For example, cable systems in the *first fifty* major television markets, as defined by the FCC, may carry a compliment of three full network stations and three independent stations. In the *second fifty* major television markets, the compliment is three full network stations and two independent stations. *Smaller* television markets may carry three full network stations and one independent station, and systems *outside* all markets have no restrictions on number or type of television signals they may carry. Cable systems serving fewer than 1,000 subscribers per headend may carry any additional signals.

The FCC does permit exceptions to these four categories. For instance, in markets with an abundance of local stations, the cable system can add the local stations to its complement. Major markets may carry two "bonus" independent stations but must deduct this bonus from any distant independent stations that have been imported to fulfill the complement.[8] The FCC points out that their "must carry" and "may carry" rules do not capriciously give to one community the right to more television service than another. Instead, the differentiation is based on the fact that densely populated areas have a larger advertising base which can therefore support more television "stations" than sparsely populated areas can.[9] In communities with no television stations, the criterion becomes simply to bring television into these outlying areas.

Additional exceptions apply to late-night programming.[10] Cable systems are permitted to carry the late-night programming of any television station when local "must carry" stations sign off the air. Moreover, network news programs which are not usually carried by the cable system can be broadcast when no local station is broadcasting a news program.[11] The FCC also makes provisions for speciality television stations, such as those programming foreign-language, religious, or automated broadcasts.[12] In certain cases, these stations do not come under the definition of an independent station when meeting their required complement; thus cable systems can carry more signals if speciality stations are involved.

Program Exclusivity

In addition to these carriage requirements, the FCC has rules which protect a television station originating a signal. These program-exclusivity rules vary for different sized cable systems, but for the most part, a station can request its local cable system to carry its signal at the expense of a distant station's signal which may duplicate the local station's programming. To understand the rule, assume that you own television station WXXX, and your grade B signal covers Elmville, which is served by the Anytown Cable System. Anytown Cable also imports a distant station's signal which duplicates your programming. You have the right to request Anytown to carry your signal instead of the distant signal. The advantage for you is that your programming, and consequently your advertisers, reach a larger audience. This protection also applies for same-day broadcasting and is called same-day nonduplication protection. The rules vary somewhat for network programming, in which simultaneous nonduplication protection is provided in most time zones. Provisions also apply to syndicated programming, and the FCC states "that a cable system serving a community in the first 50 major markets, upon receipt of notification, cease carrying syndicated programming from a distant signal during a pre-clearance period of one year from the date that such programs are sold for the first time as syndicated programs in the United States."[13] An FCC Notice of Inquiry is currently reevaluating the syndicated exclusivity rules. Pay-cable systems charging a separate rate for a certain channel or movie received a big boost in 1977 when the U. S. Court of Appeals in Washington, D. C. struck down, in part, the FCC's pay-cable rules as an unwarranted intrusion on the First Amendment. Although some groups indicated an appeal was forthcoming, the case of *Home Box Office* v. *FCC* paved the way for pay-cable systems to show first-run movies and major sporting events previously prohibited in smaller markets.

Sports programs pose a special problem for cable systems. Consequently, the FCC has a separate set of guidelines which apply to nonduplication of sports programming. It also has a sports blackout rule which protects home teams not having sold all their tickets. Cable systems are prohibited from carrying local sporting events broadcast on distant television stations when the local station does not carry the events. To understand this rule, assume that you operate a cable system in Cedarville. The Cedarville Tigers football team is playing this Saturday, but the local station will not be carrying the game since it is not sold out. Yet you know your subscribers would jump at the chance to watch it on television. So you decide to carry the coverage of the game, not from the Cedarville television station but from a distant station not required to black-out the game. Would you be within the law? *No.* You would not be permitted to carry the game since the purpose of the FCC rule is to protect local television sports blackouts.

State Regulation of Cable

State government also controls cable.[14] However, state control is not widespread and varies in degree. State laws can be classified into three categories. First are preempt statutes. These are the strongest laws and take precedent over local regulations. With preempt statutes, cable falls under the jurisdiction of the Public Utility or Public Service Commission in some states. Based on many of the same criteria specified by the FCC and the local municipality, that commission may also issue a compliance or "license" to accompany the federal authorization to operate. In addition, preempt statutes give considerable clout to the state commission, permitting it to issue and enforce a separate set of state cable regulations. These rules can govern everything from the daily operation of the cable system, to collecting fees on gross revenue, even to demanding financial collateral before allowing construction. A second approach is for a state to pass appellate statutes. With these statutes, the local municipalities still retain some control over franchising, but the state has the power to review local agreements and be the final arbiter of disputes. Everything works well until the state and the municipality disagree, then the municipality has less than an even chance against the state. A less powerful state statute is the advisory statute. Advisory statutes are obviously more popular with cable systems and municipalities since they do not exercise either the clout or the enforcement power of a state commission. Some are best described as "general guidelines" which serve as a reference for local government.

It is still difficult to predict a trend in these state statutes. Proponents of state control argue for the need for consistency among cable systems within a state. Such arguments gain support when two municipalities cannot resolve their jurisdiction differences over a cable system or when significantly differing fee structures provoke public outcry: Control of cable can also be a political plum for legislators since it means control of a communication system, and communication influences public opinion. Since cable commissions can have a significant effect on cable growth within a state, appointment to the commission can be a sweet political reward for a party in power.

Arguments against state control are equally vociferous, asserting that it presents an unnecessary duplication of law. With duplication comes conflict. The state is caught between local and federal control, and meeting the requirements of one can violate the other. The only solution to this dilemma may be a long and expensive court battle. Other opponents claim that state control merely throws local interests into a political arena with representatives who are looking out for their own interests, not those of the local community. Still other arguments warn that if the state eventually becomes involved in direct programming, that the programming will be directed more toward propaganda than public interest.

State cable regulation seems less probable today than in the past. Many state statutes now in force were passed before cable's major growth and impact. Since then, the public has grown more aware of cable's importance, and lobbying groups such as the National Cable Television Association are more organized and effective in their opposition to state control. Yet lurking on the horizon is the proposed revision of the Communications Act, which may change the entire future of cable regulation.

control of direct broadcast satellites

In a special committee meeting at the United Nations, there are discussions on governing the use of satellites in transporting television signals to developing nations. In a small community in the Rocky Mountains, a school board discusses the ramifications of educational television signals beamed into the local high school via satellite communication. From hallways to hamlets, the new technology of satellite communication has altered many of our approaches to broadcast regulation. For example, what new laws and what effect on old ones will develop when television stations use satellites to beam their signals across the United States? What new regulatory issues will arise when a cable system in Nebraska provides live coverage of an Atlanta baseball game via satellite signals beamed from Georgia?

Domestic regulation of satellite communication finds its base in a number of laws. At the federal level is the Communications Act of 1934 which regulates common carrier communication, such as telephone and telegraph, as well as standard broadcasting. Satellites with their thousands of circuits, each circuit carrying a specific amount of information, find some of those circuits falling under the common carrier provisions and others falling under the broadcasting statutes of the act. When satellites join with cable systems to complete a broadcast, state and local regulations become involved.

The framework for satellite regulation in the United States was built in 1962 with the passage of the Communications Satellite Act. This act established the Communications Satellite Corporation called COMSAT. Referring to the eventual participation of the United States in a global system of satellite communication, the act stated:

> *In order to facilitate this development and to provide for the widest possible participation by private enterprise, United States participation in the global system shall be in the form of a private corporation, subject to appropriate governmental regulation. It is the intent of Congress that all authorized users shall have nondiscriminatory access to the system; that maximum competition be maintained in the provision of equipment and services utilized by the system; that the corporation created under this Act be so organized and operated as to maintain and strengthen competition in the provision of communication services to the public; and that the activities of the corporation created under this Act and of the persons or companies participating in the ownership of the corporation shall be consistent with the Federal Antitrust Laws.*

The act assigned three areas of authority to the president of the United States, the National Aeronautics and Space Administration, and the Federal Communications Commission. The FCC's duties covered eleven broad areas: (1) ensure competition in the procurement of apparatus, services, and equipment for the developing satellite system; (2) ensure nondiscriminatory access and use of the satellite system; (3) require the construction of the system to provide services to foreign countries when advised to do so by the State Department; (4) ensure compatibility for interconnecting with other systems; (5) prescribe accounting regulations which ensure that any savings are reflected in rates for system use; (6) approve technical characteristics of the system; (7) grant construction permits for the system; (8) authorize the corporation to issue stock; (9) ensure no substantial additions are made to the system unless they are in the public interest; (10) require additions to the system when they do meet the public interest; and (11) make rules and regulations to carry out the provisions of this act.

Satellite communication also gained international prominence in 1962. The General Assembly of the United Nations passed a resolution that year stating that it "believes that communication by satellite offers great benefits to mankind as it will permit the expansion of radio, telephone and television transmissions, including the broadcast of United Nations activities, thus facilitating contact among peoples of the world."[15] A more explicit statement on the use of satellite communication came indirectly in the *Treaty of Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies.* The treaty said: "Outer Space . . . shall be free for exploration and use by all states without discrimination of any kind, on a basis of equality . . . and there shall be free access."[16]

While studying the acts and treaties which govern satellite communication, we must also understand the human implications of this technology that warrant this regulation. In a study prepared under the auspices of the American Society of International Law, Paul L. Laskin and Abram Chayes reviewed the issues facing international satellite communication.[17] The first is the problem of signal spillover. Satellite signals do not conform to political boundaries, and when one country has the ability to beam signals to another country, threats to cultural integrity, national security, and national goals take on new meaning. For socialist countries, combatant political propaganda beamed via satellites by other countries becomes a major concern. Some nations fear that those countries with huge economic and technological resources, such as the United States, will dominate international programming. Others share the opinion that American programming, although visually attractive, is for the most part trivial, banal, and violent.[18]

Laskin and Chayes also point out another consequence of commercial television. Commercials from American programming may not only displace local merchandise with foreign-made goods, but also may create a demand for consumer goods which could frustrate plans for orderly social and economic development. Underlying these arguments is another position that television systems and their development belong to each country as a product of national sovereignty. In addition, the very conception of international satellite regulation becomes a problem. Laskin and Cheyes state that "the desire for some form of international control over direct satellite broadcasting may reflect a nation's legal philosophy. Where the Anglo-American countries, for example, proceed pragmatically, formulating the rules of legal behavior as they acquire experience, the civil law tradition tends to rely on the codification of rules in advance of action."[19]

All of these issues reflect the difficult path ahead for a consistent and mutually acceptable code of international law affecting satellite communication. Thus, the immediate future of international satellite control will probably remain in the abstract terms of international treaties.

future perspectives: issues in rewriting communications law

Swirling around the broadcast industry are issues which are an outgrowth of policy decisions, new technology, and changing emphases in the industry. These issues are on everything from changing the very structure of regulatory agencies to modifying rules and regulations controlling the daily operation of broadcasting stations. Of all these issues, none has greater interest or more potential effect on the broadcast industry than the rewriting of the Communications Act of 1934.

The impetus for a major rewriting of the Communications Act of 1934 came out of congressional hearings held in 1976 on the proposed Consumer Communications Reform Act, which would have overhauled telephone regulation. Commonly called the "Bell Bill," the proposed legislation went into hearings before the U.S. House of Representatives' Communications Subcommittee under the chairmanship of Lionel Van Deerlin (Figure 15–1), a California Democrat. Cable television also was scrutinized by Van Deerlin. In October of 1976, Van Deerlin announced

Figure 15–1 Congressman Lionel Van Deerlin, chief supporter of the rewriting of the Communications Act.

a full-scale inquiry into rewriting communications legislation. The Radio-Television News Directors Association's legal counsel, Larry Scharff, prepared a position paper saying, in essence, that the best way to revise the law would be to assure that broadcast journalists received the same First Amendment rights as print journalists do.

Rewriting became the topic of numerous symposia. Gaps began to grow between rewriting supporters and those who felt a radical change in the act would not be in their best interests. The first major forum was the February, 1977 meeting of the National Association of Television Program Executives (NATPE). All the members were present, including Congressman Van Deerlin. Donald H. McGannon, chairman and president of Westinghouse Broadcasting Company, supported the rewriting. He suggested a cabinet-level Department of Communication, bringing under one roof all the agencies now controlling use of the electromagnetic spectrum. Russel Karp, president of TelePrompTer, also supported the rewriting and cited the need for cable to be given more independent regulatory status. Bill Leonard, a vice president for CBS, Inc., was on the other side of the fence. He characterized the American system of communication as the finest on earth and in reference to the 1934 act dating before current technology, said that the U.S. Constitution did not mention anything about railroads, cars, telephones, and a number of other technologies.

The next rewriting forum was at the March 1977 meeting of the National Association of Broadcasters in Washington, D. C. There, Congressman Van Deerlin stated that "the broadcaster should be entitled to the same First Amendment protection afforded newspapers." He also came out in favor of repealing the Fairness Doctrine. For those favoring more competition, the legislation was insufficient to regulate the new technology which had been developed since its passage—technology which included satellites, microwave, cable, fiber optics, citizens-band radio, radar, land mobile communication, and light wave or laser beam communication. Van Deerlin later toned down the word "rewrite" and substituted "review." The House Commerce Committee stamped its approval by doubling Van Deerlin's committee's budget appropriations.

The subcommittee's review announcement prompted industry professionals, government bureaucrats, academicians, and citizens' groups to come out of the woodwork supporting or opposing the revision. Not wanting to be left behind, the U.S. Senate announced a special Senate hearing, conducted by Senator Ernest Hollings, a South Carolina Democrat, which would review the Communications Act and everything associated with telecommunication policy. Joining with Hollings, Senator Warren Magnuson, a Washington Democrat, directed the Office of Technological Assistance (OTA) to gear up for telecommunications capability. The OTA is a research organization serving both the House and the Senate.

political dilemmas of rewriting communications law

On June 7, 1978, House Bill No. 13015 was introduced in Congress. Based on months of congressional hearings and discussions in the industry, the draft of the new revision of the Communications Act of 1934 was now public. Called the Communications Act of 1978, it was only the first such bill to be introduced. Van Deerlin himself reintroduced changes in the original draft of the first bill and, by 1979, the Senate was getting into the rewrite business. In March, 1979, even before Van Deerlin could get his revision ready, Senator Ernest F. Hollings introduced what was called the "revision" of the Communications Act and suggested changes in the current law, some of which were different in thrust than the Van Deerlin measure. To make things even more complicated, Senator Barry Goldwater also introduced his version of a bill which would overhaul the Communications Act.

The introduction of Van Deerlin's original bill, the versions introduced by Goldwater and Hollings, and Van Deerlin's own revision, all brought speculators to their feet making predictions that, with so many divided legislative proposals, prospects for enacting any real legislation were remote. Lobby groups, already taking sides on issues brought about by the original Van Deerlin bill, had their issues even more diversified by the new proposals. If change does occur, it will certainly not happen overnight. The complexities are much greater now than those pertaining to the 1927 and 1934 laws. Moreover, the 1934 Act is now a much larger document with many amendments, rule changes, and judicial precedents. Change in the current legislation could well move into the 1980s, and there are those arguing that with rapid developments in technology, even new legislation could be obsolete by the end of the 1980s.

summary

Chapter 15 has examined control of cable and satellite communication as well as efforts to rewrite the Communications Act of 1934.

The FCC's control over cable systems was established in 1962. Rules for governing cable systems were announced in 1965 and upheld in a court case involving a San Diego cable system. Official rule making was started in 1968, and detailed regulations were announced in 1972. Key issues in the regulation of cable systems include the definition of a cable system which is a nonbroadcast facility consisting of a set of transmission paths and associated signal generation, reception, and control equipment that distributes or is designed to distribute to subscribers the signals of one or more television broadcast stations." For most cable systems, carriage requirements fall into the categories of "must carry" and "may carry" signals. States and local governments also govern cable systems.

Few technologies have a more direct effect on us than satellite communication does. There are concerns over the control of satellite communication in great international bodies as well as in the small communities in which ground systems bring educational television to local school systems. Most of the basis of satellite communication control is in the Communications Satellite Act of 1962 as well as in the Communications Act of 1934.

Chapter 15 concludes with a discussion of efforts to rewrite the Communications Act of 1934.

spotlight on further learning

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part

5

Economics and Evaluation

16

advertising and economics

FOCUS After completing this chapter, we should be able to

Explain the different sources of station income.
Compare local and national rate cards.
Define *barter* and co-op *advertising*.
Understand the uses of a chart of accounts.
Explain broadcast financial statements.
Describe the role of the broadcast broker.
Describe the fourteen-point checklist for buying a station.
Identify a successful broadcast promotion campaign.

H. P. Davis was a vice president of Westinghouse when he delivered a lecture in 1928 to the Harvard University Graduate School of Business Administration, saying:

> *In seeking a revenue returning service, the thought occurred to broadcast a news service regularly from ship-to-shore stations to the ships. This thought was followed up, but nothing was accomplished because of the negative reaction obtained from those organizations whom we desired to furnish with this news material service. However, the thought of accomplishing something which would realize the service referred to, still persisted in our minds.*

H. P. Davis's persistent thoughts turned out to be the foundation of American commercial broadcasting. The purpose of this chapter is to examine more closely the different aspects of that foundation: building station revenues, station finances, buying and selling stations, starting new stations, and broadcast promotion.

building station revenue

In the United States, stations sell time to advertisers who, in turn, pay the station for having their advertising messages broadcast during that time to the listening or viewing public. That elusive commodity, time, is the product the station offers. Some "times" are better and more expensive than others. And buying a great deal of time is cheaper than buying a small amount of time.

The Local Rate Card

The rates the station charges for its time are listed on two types of rate cards— the l~~ocal rate card listing advertising rates fo~~r businesses in the station's local co~~mmunity, and a national rate card~~ for advertisers who buy large amoun~~ts of time nationally on many different st~~ations. Figure 16–1 represents one station's local rates for two time classifications, AA and A. AA time runs from 6:00 A.M. to 10:00 A.M., Monday through Saturday and 3:00 P.M. to 7:00 P.M., Monday through Saturday. These are the station's most expensive times on the local rate card, representing the drive time, those heavy radio-listening times when, along with the home audience, radio captures the listeners driving to and from work. All other days and times are listed as A class time. Class A times are less expensive than drive time since they traditionally do not attract as large an audience.

National Rate Card: Reps and Ad Agencies

Now compare the rates listed in Figure 16–2 with those in Figure 16–1. You will notice a difference of approximately 17.65 percent. The higher rates in Figure 16–2 are from the same station's national rate card. National rates are more expensive than local rates and apply to advertisers who buy large amounts of advertising in many different stations. To eliminate all the paperwork and negotiations in placing advertising with every individual station, advertisers purchase their advertising through either station representatives, called "reps," or advertising agencies. Stations representatives, as the name implies, represent the station to large advertisers. The rep also represents more than one station and contracts to buy time on many different stations to reach the audience the advertiser requests. Advertising agencies, on the other hand, represent the advertiser but buy time in the same way the rep does.

The company using the rep or agency typically pays a rate 17.65 percent higher than the rate on the local rate card. Of this increase, the

Figure 16–1 Local rate card (left).

ANNOUNCEMENTS

(AA)	6:00 to 10:00 a.m., Mon./Sat. 3:00 to 7:00 p.m., Mon./Sat.	
	60 Sec.	**30 Sec.**
1	19.00	15.20
52	16.00	12.80
156	13.00	10.40
312	11.00	8.80
624	9.50	7.60
1040	8.50	6.80
(A)	All other days and times	
	60 Sec.	**30 Sec.**
1	16.00	12.80
52	13.00	10.40
156	11.00	8.80
312	9.00	7.20
624	7.50	6.00
1040	6.50	5.20

Figure 16–2 National rate card (right). (WAZY)

ANNOUNCEMENTS

(AA)	6:00 to 10:00 a.m., Mon./Sat. 3:00 to 7:00 p.m., Mon./Sat.	
	60 Sec.	**30 Sec.**
1	22.40	17.90
52	18.90	15.10
156	15.30	12.20
312	13.00	10.40
624	11.20	9.00
1040	10.00	8.00
(A)	All other days and times	
	60 Sec.	**30 Sec.**
1	18.80	15.10
52	15.30	12.20
156	13.00	10.40
312	10.60	8.50
624	8.80	7.00
1040	7.70	6.10

rep or agency takes a commission of 15 percent. The remainder goes to the station. This 2.65 percent increase is considered compensation for handling the long-distance account, promoting itself to and through the rep and ad agencies, the extra bookkeeping, and other related costs. The advertiser, in turn, saves the time and cost of placing each individual advertising order, a cost which on large buys would run much more than the 15 percent commission.

Despite the rate cards, stations in highly competitive markets still wheel and deal to entice advertisers to buy time on their station. This usually happens when an advertising agency tries to buy the most time for the least money and pits stations against each other to see which one can offer the best price. Sometimes they are successful. There is considerable price slashing; discounts of 35 percent below the rate card are not unusual, and some stations discount 50 percent below the rate card.

Announcements or commercials can be purchased in two lengths—60 seconds and 30 seconds. Some stations divide their times into even smaller categories of 20- or 10-second lengths. The shorter time periods are common in television for which rates are higher than those for radio. For smaller businesses, the shorter announcements make buying television time possible, whereas forcing them to buy longer commercials might price them out of the market.

Prices for commercial time become less expensive when bought in quantity. For example, on the local rate card purchasing only one 60-second announcement costs $19.00 per announcement in AA time (Figure 16–1). If you purchase 52 announcements, the cost per announcement drops to $16.00 per announcement. If you purchased 1,040 60-second announcements, the cost per announcement would drop to $8.50. Similarly graduated discounts are available for 30-second announcements, and these discounts apply to all announcements made in A time as well.

Stations periodically revise their rate cards just as supermarkets revise prices of meat and eggs. Successful stations revise theirs upwards to meet inflation and to represent increases in audience. The more viewers or listeners a station has, the more people an advertiser can reach, and the more the station can charge for its commercial time. The station's market can also reflect the rate change. If the station is the only broadcast outlet with no other competition, the rate may be higher to reach the same number of people than if other stations were offering competing rates. It is the old rule of supply and demand. The cost of local newspaper advertising can also influence the rate charged by the broadcast media. All media compete for those advertising dollars.

In addition to the ones we have discussed here, other time buys are available on most stations. These include special charges for remote broadcasts, such as live coverage of a store opening, or costs for larger time blocks in which to air entire programs.

Barter/Trade-Out Arrangements

Barter, or "trade-out," arrangements are another way in which stations receive income. Barter accounts mean the station provides advertising time in exchange for goods or services offered by the advertiser. These are anything from appliances to world cruises. The goods and services can also be used by the station at its discretion. Many stations give them away as prizes, and others may award them to top station account executives.

Most prizes awarded on television game shows are supplied by manufacturers paying a small fee to receive on-air announcements in return for their products' publicity. National television exposure is a relatively inexpensive way of obtaining advertising time, compared to the usual national television rate. For the game show, the prizes are, for all practical purposes, free merchandise, and there is almost no cost to the game show to announce the products on the air, beyond the salary of an announcer. The announcements are incorporated into the programming, adding the elements of excitement and dream fulfillment as the announcer describes the "fabulous prize" the contestant has a chance to win.

Many companies engage in barter advertising. Windjammer "Barefoot" Cruises Ltd. (Figure 16–3) is one example that trades on a dollar-for-dollar basis. The cruise can be a powerful incentive to the station's account executives to "beat the bushes" for advertising. Or a station contest with a Windjammer cruise as a prize can entice listeners to "stay tuned" for their chance to bask in the sun on the open sea. For the station, the cost of airing the commercials is minimal, since the announcements are usually scheduled in unsold time which generally would go unused without the trade-out advertising. Moreover, it is profitable for both the advertiser and the station to trade on a dollar-for-dollar basis, since each is getting something at a less expensive rate than if they had to buy it outright.

The easiest way to understand the trade-out, dollar-for-dollar advantage is to consider the example of a new car. We shall assume station WAAA furnishes its sales manager with a new car to use for business travel, such as calling on sponsors. In order to do this, the station enters into a trade-out agreement with the local car dealer. The car costs $8,000. In return for the car, the station will air $8,000 worth of commercial announcements for the car dealer. For the station, the cost of providing these announcements is less than $8,000, since the commercials are scheduled at unsold times when other commercials would not air anyway. Without the trade-out, the time would simply go unsold. Since the station must stay on the air in any case, the cost of operating the station remains the same. For the dealer, since the company bought the car wholesale, say for $6,000, that would be the total cost to the car dealer for $8,000 worth of advertising.

Figure 16–3 (Windjammer "Barefoot" Cruises)

Although trade-out advertising is common, stations try to avoid it, especially when the advertiser is willing to pay cash. Cash looks better than merchandise when the annual financial statement is prepared. Furthermore, when stations are sold, trade-out advertising is usually not considered part of the station's annual income, since the merchandise supplied by the advertiser usually cannot be used to pay the station's bills.

Co-op Advertising

Co-op advertising is an arrangement by which a local store splits part of the cost of advertising with the company whose products are mentioned in that advertising. For example, a radio announcement of a sale of Westinghouse appliances at the Ace Appliance Store costs $19.00. In a 10/90 co-op advertising arrangement between Westinghouse and the store, Westinghouse would pay 10 percent of the cost of the announcement, or $1.90, and the store would pay $17.10. The radio station still receives the rate card price for the announcement, Ace airs the commercial at a 10 percent discount, and Westinghouse receives local advertising exposure. Figure 16–4 shows the copy of a typical co-op radio commercial. This particular company manufactures Photo Charms, popular miniature reproductions of favorite photographs attached to charms, and jewelry products. The company pays 10 percent of the cost of radio commercials for which they supply the copy.

Not all companies use co-op advertising, and the amount paid by the manufacturer and the local store varies considerably. Newspapers continue to receive the majority of co-op advertising dollars, about 75 percent, since co-op advertising began with newspapers before broadcast advertising was widespread.[1] Some companies employ full-time co-op managers whose responsibility is to keep track of co-op advertising by retail outlets and to show retailers how to coordinate their advertising with the manufacturer's co-op program.

Combination Sales Agreements

Although not a common practice, some account executives are employed by more than one station. When this occurs, the FCC has some strict guidelines to guard against rate fixing or selling time on more than one

Figure 16–4 (Taylor Graphics Corp. Greencastle, IN)

ANNOUNCER:

LOOKING FOR THAT PERFECT GIFT FOR SOMEONE SPECIAL?

(Dealer's Name) AT (Dealer's Address)

HAS THE ANSWER FOR YOU.....PHOTO CHARMS. PHOTO CHARMS ARE MINIATURE REPRODUCTIONS OF YOUR FAVORITE PHOTOS BEAUTIFULLY MOUNTED ON CHARMS....HEIRLOOM LOCKETS.... EVEN ON MARBLE PAPERWEIGHTS OR HANDSOME ZIPPO LIGHTERS.

STOP IN AT (Dealer's Name) AT (Dealer's Address) TODAY AND SEE THEIR LARGE SELECTION OF THESE TRULY PERSONAL GIFTS.

SO WHEN YOU WANT TO GIVE SOMEONE SPECIAL A LASTING GIFT THEY'LL CHERISH, CHARM THEM.....WITH PHOTO CHARMS FROM (Dealer's Name).

station for a single rate.[2] Although representing two stations is not illegal, selling time for two competing stations is. The definition of competing is any two stations whose signals overlap, regardless of which market they serve. Moreover, a radio and television station combining to offer a single rate is illegal, even if the two stations are jointly owned. Because other radio stations might not be able to team up with a television station, the FCC feels such arrangements are counter-competitive.

A single rate for an AM and an FM station engaged in simulcasting is permissible. But if combination rates are offered for two stations commonly owned but not engaged in simulcasting, management must be careful not to use the combination rate to "carry along" the weaker of the two stations. For stations not engaged in simulcasting, forcing an advertiser to buy a combination rate is illegal. If the advertiser wants to buy advertising on only one station, then that opportunity must be available to the advertiser.

station finances

Once it is earned, a station's advertising revenue is translated into a series of numbers that managers, bookkeepers, accountants, investors, and bankers spend many hours studying and using to answer some complex questions. How can we improve daytime sales? How can we cut expenses? How much money will we need to borrow? How much money should we invest? These queries and countless others plague station executives as they mull over their charts of accounts and financial statements.

Chart of Accounts

The basic ledger to record all station finances, both income and expenses (disbursements), is the chart of accounts.[3] Although charts of accounts vary, many in broadcasting use a system of numbers beginning with the prefix digits 10 and altering the prefix to represent a different account classification. For example, assume the numbers 100 to 199 represent assets. A specific number is assigned to each type of asset, using a two-digit prefix. The following represents cash accounts, which are considered assets, designated by the 10 prefix:

101 Cash in banks—regular
102 Petty cash
103 Cash in banks—payroll
104 Cash in banks—other

The prefix 14 might represent advances and prepayments:

141 Prepaid insurance
142 Prepaid rent
143 Prepaid taxes and payments of estimated taxes
144 Expense advance to officers and employees

Three-digit accounting systems provide about as much flexibility as the average broadcaster needs, but additional numbers can be added wherever appropriate. For instance, a group owner might want a prefix to identify each station in the group. So WAAA might have the prefix 5. Thus, if we wanted to know the petty cash at WAAA, we would look under account number 5–102, 5 representing the station and 102 representing petty cash. WBBB might be assigned the number 6, and so on. Some computer programs use additional numbers to facilitate more complex data analyses of the station's financial status.

Using the chart of accounts for identification, management can make periodic checks on the station's financial structure as well as to pinpoint and plot its activity over time. Such information is critical for management to ensure the station's profit structure. The information and accounting systems are equally as important to the broadcaster selling the station, the banker lending the station money, or the accountant preparing its tax returns.

Financial Statements

The chart of accounts is the basic accounting tool of the station, but the money recorded in using the chart of accounts is translated into many different financial statements. Figure 16–5 is a station balance sheet. Notice assets ($90,000) equal liabilities and equity ($90,000). Balance sheets must always balance. They represent a stop-action picture of the company on any given day, usually the last day of the year. Why must the balance sheet balance? Because all assets have a claim on ownership, equal to those assets. For example, suppose you drive a car worth $5,000 (a $5,000 asset). The title is in your name, and for all practical purposes it is your car. But what about claims of ownership of your car? We shall assume you still owe the bank $1,000 on your car. In accounting terms, the bank owns $1,000 worth of your car, and you own $4,000 worth of your car. The claims on ownership of your car represent $1,000 (the bank's claim) plus $4,000 (your claim), together totaling the exact value of the car, which is $5,000.

A comparative balance sheet compares assets and liabilities between two points in time. An income statement shows the amount of income

WBPE, Inc. BALANCE SHEET January 31, Year 1	
Cash	4 000
Accounts receivable	2 000
Depreciable assets	50 610
Land	10 000
Intangibles	23 390
ASSETS	90 000
Accounts payable	5 000
Notes payable—sellers	38 000
Notes payable—stockholder	50 000
Liabilities	93 000
Contributed capital	1 000
Loss since inception	(4 000)
Stockholders' Equity (Deficit)	(3 000)
LIABILITIES AND EQUITY	90 000

Figure 16–5 (National Association of Broadcasters)

after the debits are subtracted from the credits, or stated another way, it tells how much money is left after all the bills are paid.

A comparative income statement compares income between two points in time. Figure 16–6 is a comparative income statement comparing two years of broadcast operation. Notice that the revenues are listed first, then the expenses (indented), followed by the total expense. In year 8, we see the station's income before taxes was $11,500, on which a federal income tax of $2,530 was paid, leaving an income of $8,970.

If you are the treasurer of a broadcasting station, an especially important financial statement would be the cash flow statement. The cash flow statement would tell you the amount of money necessary to keep

Figure 16–6 (National Association of Broadcasters)

WBPE, INC. COMPARATIVE INCOME STATEMENT Year Ending December 31	Year 8	Year 7
Revenues	168 900	162 200
Technical expense	12 300	12 100
Program expense	48 200	47 600
Selling expense	29 400	28 100
General & administrative	67 500	63 900
Expense	157 400	151 700
Income before tax	11 500	10 500
Federal Income Tax	2 530	
INCOME	8 970	8 190

the station running smoothly. It would also tell you if you needed to borrow money to pay the bills or to invest excess income. A cash flow statement is looked upon as the "state of health" of the station and can be used to help find where changes in operations may have to be made.

Figure 16–7 is a cash flow statement comparing one year of operation with the projected cash flow for the coming year. Notice year 9. If projections hold true, year 9 will see the station spend more money than it makes, resulting in a cash overdraft of $29,795. As treasurer, you will need to inform management of the necessity to borrow at least $34,795 to make ends meet and still have the $5,000 desired minimum cash balance. If management does not want to borrow the money, it must change that year's projected operating procedures. Management might decide to "make do" with the equipment on hand and save the $20,000 budgeted for "purchase of equipment." But as treasurer, you point out that never in the station's history has that ever been done, that the equipment is old, and that the station's transmitter cannot last out even this year. Can you suggest cutting other disbursements? What recommendations can you make, and what will be the consequences? These are the questions that financial statements both pose and help answer in running a broadcasting station.

Figure 16–7 (National Association of Broadcasters)

WBPE, INC.
CASH FLOW STATEMENTS
Years Ending December 31

	Projected Year 9	Year 8
CASH BALANCE AT JANUARY 1	8 505	9 113
Collections from advertisers	190 000	173 460
Cash Available	198 505	182 573
Technical disbursements	15 000	8 229
Program disbursements	50 000	45 861
Selling disbursements	52 000	39 400
Administrative disbursements	74 000	70 825
Agency commission payments	8 000	6 100
Repayment of stockholders loan		886
Dividend payments	200	200
Federal income tax payments	9 100	2 567
Purchase of equipment	20 000	
Total Disbursements	228 300	174 068
CASH BALANCE AT DECEMBER 31, YEAR 8		8 505
PROJECTED CASH AT DECEMBER 31, YEAR 9—overdraft	(29 795)	
DESIRED MINIMUM CASH BALANCE	5 000	
REQUIRED ADDITIONAL FUNDS	34 795	

buying and selling broadcast properties

Financial statements also are especially important when a station changes hands. Buying and selling broadcast properties, including CATV, is big business, involving everyone from small-town entrepreneurs to corporate conglomerates. Actually, buying a station requires knowledge of the broadcasting business and considerable money, not only to buy the station, but to operate it until it builds an income. The sale of a station must also be approved by the FCC, which scrutinizes everything from the buyer's and stockholders' characters to their financial worth, to their other media investments, to their history in managing other enterprises. A record of bankruptcy can quickly close the door to owning a broadcasting property.

The Broadcast Broker

At the heart of over 70 percent of broadcast property sales is the broadcast broker—the real estate person of the broadcasting business. Most are seasoned professionals with years of experience in station transactions. Many people wanting to sell or purchase a broadcast property begin by contacting the broker. Using personal contacts, referrals, advertisements, and in some cases direct solicitation, the broker knows what properties are for sale, at what price, and who the buyers are. Since the sale of a broadcasting property can run into millions of dollars, good brokers are highly paid, but most industry professionals would agree that they are well worth their commission.

Brokers can operate independently or as members of a large firm. One well-known independent broker headquartered in Chicago but handling properties nationwide is Richard A. Shaheen. His brokerage business, Richard A. Shaheen, Inc. (Figure 16–8), has handled a wide range of station transactions, and Shaheen himself, has been in the station brokerage business since 1955.[4] His job takes him wherever it's necessary to bring together a buyer and seller. In addition to this travel, correspondence, national and state conventions and the telephone are important elements of keeping in contact with people in the industry.

Who buys broadcasting properties? Richard Shaheen deals primarily with people already in the media business. "They understand the business. They have the know-how; they know the language; they understand the business," he says. Still, Shaheen receives inquiries from people outside the industry. "Many still see the pie in the sky, that you can walk in and pick it like you're picking apples in the fall." Of those prospective buyers who are currently active in the broadcasting industry, he said, "most come from management, sales or ownership rather than being program oriented. These people deal with dollars every day and they

Figure 16–8 This ad, used by Richard Shaheen, has become a trademark in key broadcasting publications.

understand the business side of broadcasting more thoroughly". He also says, "I find that newspaper owners are good buyers simply because they are accumulating considerable profits through their newspaper operations and encounter tax problems in the accumulation of this cash. Instead of paying high taxes on the profits, they prefer to reinvest it." Further, Shaheen says that broadcast group owners are finding similar problems today because of the high profitability of stations.

Who sells broadcasting properties and why? Shaheen lists retirement as one reason but certainly not the only one. "Some people just need a change. The station has matured, and the owner wants a new challenge. So he'll go out and buy a different one." Location is another reason. "Others want to change markets. They look for a new place to live, a new challenge." Still others, he says "have used the stations as a tax shelter and have depreciated the property as far as the tax benefits will allow." And then there is capital gain. Looking back to the 50s, Shaheen remarks, "Back then, some people might buy a station for $60,000, keep it for six months, and sell it for $100,000. They thought they made a fortune, and they did in those days." And although prices have changed and stations are held longer, Shaheen is quick to point out, "People still sell stations to get the capital gain."

How does the broker participate in the sale? "By spending a lot of time with the buyer and seller," Shaheen states. He prefers to be directly involved in the sale until the attorneys draw up the contracts between buyer and seller. Then, "I want to watch what happens in the contract," he declares. Although preferring to handle the sale exclusively because of the commission and keeping track of the proceedings, Shaheen does at times work with other brokers. Co-brokering is a very common practice among many brokers. It has benefits for buyers, sellers and the brokers, particularly if one broker is stymied in locating the right buyer for a property. He or she may find it expedient to contact other brokers. Shaheen feels that his first obligation is to the seller. Obtaining the price and terms is important, and sometimes it is necessary to co-broker to meet those ends.

Although commissions can vary, typical brokerage fees for handling a station sale are 5 percent of the first million dollars, 4 percent of the second million, 3 percent of the third million, and 2 percent of the balance.[5] Brokers also perform property appraisals for clients. For an appraisal service, $500/day and up are typical charges.

Broadcast Buyer's Checklist

Still, the primary business of the broker is handling the sale of broadcast properties. And for the buyer, this involves many factors to consider before the final transaction. A concise, fourteen-point buyer checklist has been prepared by the brokerage firm of Richard A. Shaheen, Inc. The prospective buyer of a broadcast property should carefully examine the following:

1. *Gross Sales*
   Review gross sales record for three previous years.
   Determine if any represent "trade" dollars.
   Check any undue use of promotions to inflate gross.
   Determine what share of the total market revenue the station enjoys.
2. *Operating Profit*
   Is it before or after all taxes?
   Does it come after depreciation?
3. *Cash Flow*
   The most accepted method of determining a true cash flow is that which calls for it being a total of the following ingredients:
   a. Net profit before taxes.
   b. Depreciation.
   c. Interest Paid.
   d. Officer's salaries.
   e. Director's fees.
   To this can be added any true non-recurring expenses. A buyer should also consider the effect a new, higher base of depreciation will have with respect to the net profit after taxes. An owner-operator's salary and others should also merit consideration as part of cash flow.
4. *Fixed Assets*
   Age and condition of major pieces of equipment?
   Do they meet FCC specifications?
   Does the sale include all fixed assets?
   Anything on a lease basis?
5. *Leases, Licenses and Contracts*
   Determine beginning and end date and all details of:
   a. Land and building rentals.
   b. Personnel contracts.

c. News Service.
d. Transcription or jingle services.
e. Film contracts.
f. Station-purchased advertising contracts.
g. Music copyright services.
h. Trade association memberships.
i. Equipment purchased or leased.
j. Time sale contracts.
k. Representative firm arrangement.
l. Union contracts.
m. Network agreements.
n. Music format contracts.

6. *Legal Actions*
Are there any legal actions pending against the station?
Are there any complaints filed with the FCC?
7. *Personnel*
Salary and position of all employees.
Salesmen commission arrangements.
Bonus or percentage plans.
Vacation policy.
Status of station's "affirmative action" program.
8. *Advertising Rates*
Obtain a copy of all current rate cards and determine both when these rates went into effect and how they compare with the competition.
9. *Station Coverage*
Is it sufficient to cover the market?
How does it compare with the competition?
Can the signal be improved?
10. *Program Format*
Determine:
a. Rating and demographic position for past two years.
b. Definitive explanation of present format.
c. Type of programming on competitive stations.
d. Promotions in the market—type and extent.
11. *FCC Record*
Ascertain if the license is presently in effect and also whether there are any actions pending in the FCC that directly involve the facility. This could include engineering, programming, EEO policies, and minority hiring status.
12. *Market Frequencies Available*
Check to see if there are any applications filed or construction permits granted for additional facilities servicing the market.
13. *Competition*
Compare ratings, rates, and program formats of competitive stations.
Also determine circulation and advertising strength of daily or weekly newspapers.
14. *Market*
As much care should be spent in investigating the market as the physical facility of the station itself.
Carefully review:
a. Population growth–past and anticipated.
b. Retail sales.
c. Major sources of employment.
d. Consumer spending power.

If a buyer finds positive information after reviewing the items in the checklist, then the buy is probably a good one, provided the price is right.

A fair price is a difficult thing to pinpoint, but for radio and television stations, it is usually based on about 2 1/2 times gross annual billing. Cable companies are appraised at about $500 per connection. Today, however, with the scarcity of space on the electromagnetic spectrum, inflation, the potential of AM stereo, the growth of FM, and the effects of other media, the formula for determining what a property is worth can vary considerably.[6]

the role of promotion in building station revenues

For both new stations and those with long records of operation, station promotion is an important part of the broadcasting business. Perhaps more so than with other businesses, broadcasting as an entertainment industry entails promotion. Successful station promotion is much more than a few announcements promoting a program or personality. Instead, it is a well planned and systematically executed campaign. More and more stations are realizing the importance of station promotion. Many have rested on the laurels of their programming without learning from the example of other businesses that competition requires promotion to convince the public that they should patronize your business or listen to your station. In fact, broadcast promotional campaigns are becoming a necessity in many markets.

Promoting Assets

For every station, the important commodity is reaching a listenership or viewership. Thus, how the station fares in the ratings becomes the central theme of many promotional campaigns. Although only one station can be first overall, many stations can find their own niche in the ratings data. A certain station, for example, may be first among women, another first among 18- to 34-year-olds, another first among men aged 34 to 49, another first during morning-drive time, and still another first in late-evening news viewership. Each placement in the audience surveys can provide opportunities to promote the station's accomplishments.

Another consideration is the cost-per-thousand (CPM) of reaching the station's audience, or stated another way, what it will cost an advertiser to reach each 1,000 viewers. Perhaps the station does not have a first place showing, but its CPM is lower than that of any of its competition. Pointing this out to cost-conscious advertisers can make ratings a moot issue in a sales presentation. Naturally, the station with both an audience and a low CPM is in an especially competitive position.

Other promotional campaigns can be centered on such elements as new call letters and format changes. If a station changes hands and consequently changes call letters, calling attention to the new "identity" is critical. Similarly, changing formats often results in reaching a new audience. Telling that new audience about the new sound, and telling advertisers about that new audience are equally important.

Everyone understands awards, and some of the most familiar belong to broadcast journalism. Although promoting only one department—the news department— publicizing a journalism award can boost other areas of the station as well. This is especially critical to television in which the local news is one, if not the single most important, item determining the audience's perception of the station. More than one television station has ended up first in the ratings with local news pulling the station to the top, while its network programming in other markets and nationwide was running a poor third.

Planning Successful Promotion

To be successful, a promotional campaign must have certain qualities. One of the most important is simplicity. Although ideas such as contests and giveaways can be effective audience builders, successful long-term promotions have a central, underlying theme. Such slogans as "Musicradio," "Candlelight and Gold," "Radio Indiana," and "Happy Radio" can be woven throughout the station's programming. If ratings are being publicized, a single, concise statement that the station is first is much better than many sentences about the station's share of the audience.

Consider the billboard in Figure 16–9. A play on two words is all that is necessary to explain the station's number one position in the overall ratings. The promotion is short, concise, and the word "one" takes on the dual meaning of being first and winning the ratings race. This same "we one" theme can then be repeated on an entire series of promotional ventures, from direct mail flyers to station letterheads. The slogan also can be presented in many different media formats without looking cluttered. Too many promotional campaigns try to tell too much and accomplish nothing. Going beyond a few words or a single symbol usually begets more confusion than clear identity.

Simplicity also belongs in station logos. Notice the two logos in Figure

Figure 16–9

KRON · SAN FRANCISCO

KING TV5

Figure 16–10 (KRON logo: courtesy KRON. King logo: reproduced with permission of King Broadcasting Company, Seattle, Washington; all rights reserved.)

16–10. King Broadcasting in Seattle, Washington uses a letter and a few dots to represent a king's crown. Channel 4 in San Francisco finds the channel number ideal for a logo illustrating the Golden Gate Bridge. As an important part of station image, many logos carry registered trademarks. Effective designs are uncluttered; come out well in black and white, which is essential to newspaper advertising; look good on letter heads; and can be easily recognized and understood.[7]

Besides visual identities, audio identities are basic, especially in radio. Most radio stations have a particular "sound" in addition to their musical format. These sounds are most often reproduced in a "jingle package"—a collection of sounds designed around a four- to eight-note sequence fitting the call letters. Variations in the jingle package are then incorporated into news introductions, bulletins, musical bridges between records, and backgrounds for commercial and public service announcements.

Equally important to simplicity is consistency. Too many stations make the mistake of constantly changing their promotional theme. Many mediocre promotional efforts have been successful simply because they have continued unchanged long enough for the audience to accept them as household words. The very best promotional effort lasting six months and then disappearing defeats the purpose of the campaign. Contests and giveaways will change from season to season, but there needs to be a consistent theme which represents the station over time, be it the logo, jingle package, or a combination of both. When done effectively, a promotional campaign can elevate the awareness of the station among its audience, and being aware of the station is the first step in building an audience.

summary

At the basis of building station income is the rate card. Local rate cards illustrate the rates charged to local advertisers. With rates approximately 17.65 percent higher than local rates, the national rate card is used for national advertisers placing orders through station representatives or advertising agencies. Barter or tradeout advertising and co-op advertising are two other sources of station revenue. The FCC has certain guidelines guarding against monopolistic practices and prohibits certain revenue-building schemes which use combination advertising rates among competing stations.

In managing station finances, the chart of accounts becomes the numerical and descriptive list used to classify income and expenditures. Financial statements usually include the balance sheet, comparative balance statement, income statement, comparative income statement, and cash flow statement.

People investing in broadcasting are those who buy stations or start new ones. The broadcast broker is the real estate person of the broadcasting business and is responsible for arranging many of the transactions. A prospective buyer should examine fourteen key areas before buying a station. These are investigating gross sales, operating profit, cash flow, fixed assets, leases/licenses and contracts, legal actions, personnel, advertising rates, station coverage, program format, FCC record, market frequencies available, competition and market. Preliminary work in launching a new station includes a frequency search and obtaining a construction permit. When a license is granted, regular programming can begin.

Promoting a station is becoming essential as more stations sign on the air and competition increases. An effective promotional campaign contains two major qualities—simplicity and consistency.

spotlight on further learning

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17

broadcast ratings

FOCUS After completing Chapter 17 we should be able to

Describe the development and function of broadcast ratings.

Interpret broadcast ratings.

Give examples of how ratings are used in making management decisions in broadcasting.

Identify the issues in the criticism of broadcast ratings.

Understand the function of the Broadcast Rating Council and speculate on the future of broadcast ratings.

To be truly effective, any communication system must have an efficient means of gathering and evaluating data. We learned how intrapersonal communication sends electrochemical impulses from our senses through the nervous system, triggering our muscles to react. We also learned how interpersonal communication uses direct feedback to evaluate what people are saying and how other people react to this communication. Such feedback is also vital to mass communication and is found in many forms in broadcasting. A disgruntled viewer writes a letter to the television station or network complaining about programming. A sophisticated computer daily analyzes viewing habit data from meters attached to home television sets, from viewers' diaries, from an assortment of answered questions by interviewers, and from completed viewing questionnaires returned through the mails. A network pollster gathers data on election day. A radio program director examines data to prepare the weekly playlist. Management listens to its employees' opinions. All are examples of feedback necessary for the successful maintenance and operation of a broadcasting system. This chapter and the next are on this feedback. In chapter 17 we'll examine broadcast ratings, surveys, and public opinion polls. In chapter 18 we'll discuss specialized feedback, including letters from the broadcast audience, feedback to the FCC, responses to the networks, and the feedback process determining the music you hear on your favorite radio station. Let's begin by examining the broadcast ratings.

the background of broadcast ratings

Possibly the first broadcast was rated in 1929 when an interviewer for the Crosley Radio Company called a randomly selected number from the telephone directory. The person who answered was asked, "What radio stations did you listen to yesterday?"[1] Since that time, broadcast ratings have been criticized as being inaccurate, unreliable, and arbitrary. They have been accused of canceling quality programs, determining network policy, and influencing everything we see and hear on the broadcast media. They also have been perceived as being a subsidiary of the television networks and cooperating with sponsors. All of these misconceptions are just that, misconceptions. The broadcast ratings are those services which tell how many people are viewing or listening to what, when, and how often. Some of the most familiar include the A.C. Nielsen Television Index, Arbitron, and Pulse. The rating services have nothing to do with the networks and are not responsible for canceling programs. Rating services are separate corporations, not part of the network structure. However, stations and networks use the data from rating surveys to make decisions on what programs to cancel or keep on the air. As a result, the rating services get blamed for canceling programs when it is the stations and networks that make the decisions. Despite serious criticism, the ratings have also proved to be, for the most part, very reliable, producing some of the most accurate and sophisticated audience research data available. But they are by no means perfect. Along with the major ratings services, which are controlled and professionally responsible, are minor ratings services which do use some of the methodologies that legitimize criticism of the broadcast ratings. It is important from both a consumer's and a professional standpoint to learn how ratings work, what function they have, and how reliable they actually are.

The Function of Broadcast Ratings

Media subscribe to broadcast rating services in much the same way as they subscribe to syndicated material. But this product is feedback, feedback on the size and composition of the medium's audience. For instance, if you were operating a commercial television station in a major city, you would want to know how many people watched your station in comparison with other stations. You would also be interested in detailed demographic information on those viewers, such as age, sex, education, and income. This information is essential to your advertisers. Similarly, you would want to know when these audiences tuned to your station. You would also want to know whether a particular program commanded a larger share of the audience than some others did. What share of the audience did your newscast capture, compared with competing television stations? Your advertisers need all of this information in order to purchase air time wisely, your station's air time.

Advertisers also want to compare the cost of attracting these viewers. By combining the information found in these ratings with a listing of the cost of your station's commercials, commonly called a rate card, an advertiser might discover that the cost of reaching 1,000 people (cost-per-thousand) via your television station is less than the cost-per-thousand on another television station. If it can be proved that your television station reaches more potential customers than your competition does, the advertiser probably will realize that buying commercials on your station is a wise investment. Rating services provide the necessary proof.

With this proof in hand, you may find that certain programs need to be rearranged or even canceled because of limited viewership. It simply is not profitable to air them, or at least to air them in that particular time-slot. Notice the word you. As a media executive, you are making the decision to cancel or reschedule a program, not the rating service. Many viewers under this misconception have complained to the rating services about the cancellation of their favorite television program or the dismissal of their favorite radio personality.

The rating services do not make the decision to cancel programs. They do provide station management with information on how many viewers or listeners a station has, comparing this to other stations in the same community or, on a national scale, other networks. If a station is not attracting the number of listeners or viewers that management feels it should, and that same management feels a change in personnel or programming will improve the ratings, then the result may be a change in staff or programs. But keep in mind the many aspects of ratings. A station with few viewers may be perfectly comfortable with that fact since the specialized audience it is reaching may have high incomes and considerable buying power. Public broadcasting stations, knowing their ratings' position among commercial stations, direct quality programming to an audience with a higher educational level than average. Such a station may be perfectly satisfied with less than first place.

The entertainment industry also is interested in ratings because they specify the kinds of programs that will be a hit and those the public wants. If the public demands situation comedies, then producing science fiction for prime-time television might not be a wise decision. Similarly, the producer of a television series is interested in what share of the audience his program had in cities across the country or around the world.

Although broadcast management and the entertainment industry generally believe that the larger rating services are accurate and reliable, the public does not. A lack of understanding of the methodologies used creates considerable skepticism. Personal preference is also powerful, and all of the mathematical formulas in the world will not convince a devoted viewer that a favorite television program has been canceled because too few people watched. "That's impossible; all my friends watch that program every week!" This enthusiasm may be mistaken. Among your friends, perhaps everyone does watch the program. But perhaps because your friends watch the program and talk about it in the dormitory, their friends do not want to be left out, so they also watch. Neither "standard" is an accurate indication of how the rest of the viewing audience feels about the program. How is a broadcast rating determined?

Judging Accuracy: The Sampling Process

A typical ratings skeptic will claim that there is absolutely no way that a small group of people selected to tell what television programs they watch or what radio stations they listen to can possibly determine the viewing or listening habits of thousands or millions of other people. To some extent they are correct, but only if the group of people polled is extremely small.

At the heart of broadcast ratings is a process called *sampling*. Sampling means exactly that, examining a small portion of some larger portion to see what the larger portion is like. A chef in a large restaurant tastes a tiny teaspoon of soup from a five-gallon kettle to determine if the soup is ready for serving. A doctor can examine a small blood sample from your arm to ascertain the characteristics of the rest of the blood in your body. Obviously, sampling is a much better way of determining your blood characteristics than draining you dry!

The essence of the process is ~~a type of sampling~~ called *random sampling*. Random sampling means that when ~~a sample~~ is taken, *each unit of the larger portion has an equal chance of being selected*. If the population of Toronto, Canada is being sampled, each person in Toronto has an equal chance of being selected. If households are being sampled, *each household* in Toronto has an equal chance of being selected. There are even different types of random sampling. If you picked numbers out of a hat, you would be conducting a simple random sample. But let's assume you wanted to draw a sample of 100 names from a voting list of 1,000 names. So you chose every tenth name on the list to obtain your sample of 100. By doing this, you conducted a systematic random sample.

You may say, "OK, I'll get on the phone, randomly select ten people from my hometown telephone directory, ask them what radio station they're listening to, and find what the rest of the town is listening to." If you do this and your prediction turns out to be true, you simply would be lucky. Because the random sample you selected was so small that its sampling error was too *large* to make an accurate prediction. *Sampling error* is determined by the size of the sample. The larger the sample, the smaller the sampling error.

Mathematicians centuries ago proved that a truly random sample is all that is needed to tell the characteristics of a larger population. Moreover, once a certain number of people are chosen for the random sample, increasing that number will not significantly change the outcome. In fact, you may be surprised to find out how small that random sample needs to be. For example, a truly random sample of 600 people is sufficient to make a prediction about the entire city of New York with only a ±4 percent sampling error.[2] That means that if 75 percent of the 600 people you sampled were listening to a certain radio station, then you could predict that somewhere between 71 percent (75 percent − 4 percent) and 79 percent (75 percent + 4 percent) of the entire city of New York was listening to the same radio station. Increasing your sample size to 1,000 only would decrease the sampling error to ± 3.1 percent. Moreover, increasing the size of the population to include the entire United

States would not significantly change the sampling error. With these figures, it is easy to see that a rating service can predict the viewing or listening habits of an entire city or nation by sampling about 1,200 people and still be within a few percentage points of being accurate. Although there will always be skeptics, those who understand sampling and other factors in the ratings process rely on them to make programming decisions.

Gaining Cooperation for Data Collection

Some of the most critical steps in determining a broadcast rating are in the data gathering process. After the random sample has been selected, the rating service next must secure the cooperation of people willing to provide the information that it is trying to collect. People may be hesitant to cooperate with a rating service for a number of reasons. They may be apprehensive of the stranger at the door or on the telephone who is requesting their help. Other prospective candidates may not be at home or may have moved. To overcome these obstacles, field representatives employed by the major rating services are highly trained in everything from persistance to interpersonal relations, training that has paid off in a cooperation rate of approximately 80 percent. One interesting research finding has shown that the person who watches educational television is more inclined to cooperate with a rating service[3] than those who seldom watch educational television. Thus, a rating service that interviewed only "easy cooperators" could find its results leaning toward educational television programs. This leads us to conclude that, although a high cooperation rate is important to secure fairly accurate ratings, the rating service needs to persevere if it encounters resistant candidates in its random sampling procedure.

Interviews, Diaries, and Meters

The rating services use three different methods of gathering information: interviews, diaries, and meters. Interviews are either personal or by telephone. Different studies have produced differing results on which is more effective.[4] Some rating services use both. Regardless of which type is used, certain variables must be considered in determining their outcome. For example, differences in personality among interviewers is important. You know that you react differently to the same question asked by different people. The tone of their voices, their articulation, and their inflections all influence your interpretation of their question. Dress can be another variable. A neatly dressed interviewer can communicate a sense of importance to the interview. Showing up at the front door unshaven or with your hair set in rollers would communicate something entirely different. When many different people gather data, these same variables can distort the results of the survey. Even a slight rewording of the question can change the results. Rating services, therefore, conduct sophisticated training sessions to make sure their interviewers are asking the same questions in the same way.

Besides personal and telephone interviews, rating services frequently utilize the diary method of collecting data. With this method, the viewer or listener keeps a record of the programs and stations he or she tunes to at periodic intervals during one given week. This schedule is then mailed back to the company which tabulates the results of all diaries submitted. In some cases, a small monetary incentive is included with the diary, usually a half-dollar. Figure 17–1 is a page from an Arbitron diary

Figure 17–1 (Arbitron Radio)

WEDNESDAY

TIME (Indicate AM or PM)		STATION		PLACE CHECK ONE (✓)	
FROM —	TO —	WHEN LISTENING TO FM, CHECK HERE (✓)	FILL IN STATION "CALL LETTERS" (IF YOU DON'T KNOW THEM, FILL IN PROGRAM NAME OR DIAL SETTING)	AT HOME	AWAY-FROM-HOME (INCLUDING IN A CAR)

PLEASE CHECK HERE ◯ IF YOU DID NOT LISTEN TO A RADIO TODAY.

PLEASE MAIL TOMORROW

to measure radio listening. It specifies the day of the week which the particular page(s) covers, the time at which the radio station was listened to and the duration of listening, a special column to note FM listening, and a place to check if listening was done at home or away from home. Arbitron also leaves a space at the bottom of the page to check if you did not listen to radio that day.

The third method of rating service data collection is the meter method. The meter method is used by both A. C. Nielsen and Arbitron. Nielsen enlists the cooperation of a household to install on the television set a small, inconspicuous, monitoring device called a Storage Instantaneous Audimeter (Figure 17–2), which is connected through a telephone system to Nielsen's central computer. The computer automatically dials each monitoring device at specific intervals and records the readings. The monitoring not only reveals what channel is on at any time of the day but also tells if more than one set is in use in the household. Diaries in other homes also supplement and help verify the Nielsen meters. Although each of the three methods has its advantages and disadvantages, research has shown little difference in the reliability of data collected from any of the three.[5]

When the data reach the rating service headquarters, banks of computers (Figure 17–3) process the information and provide printouts in the form of ready-to-publish sheets which are bound in booklet form and made available to the local stations and networks. The computer data sometimes are also given to advertising agencies and station sales representatives to aid in making time buys. If a media buyer for an ad agency in New York wants to know on which stations to buy commercials

Figure 17–2 Nielsen Instantaneous Audimeter. (A. C. Nielsen Co.)

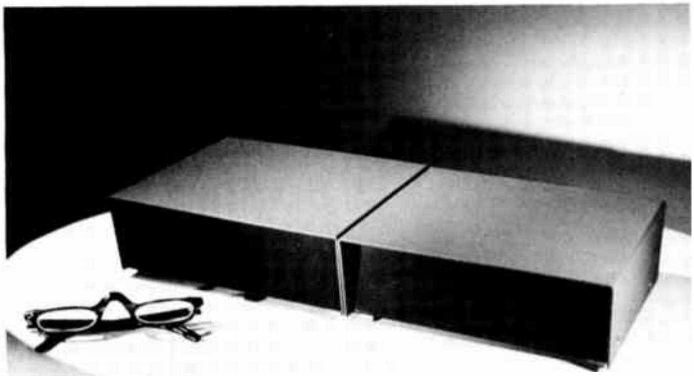


Figure 17–3 Arbitron computer center. (Arbitron)

to reach the female audience 18 to 34 years of age in Seattle, Washington, the computer will provide the information. Similar information can be supplied for national time buys when an advertiser wants to reach a certain type of audience.

interpreting the ratings

Up to this point we have talked about some of the methods used to collect broadcast ratings. Now we're going to learn how they are interpreted, some of the formulas used to interpret them, and the meaning of the terms commonly used in reporting ratings. This material is not difficult, and you do not need to know much math. But read carefully. You should remember that the terms we'll encounter sometimes have different meanings to different rating services.[6] Although we'll learn some widely used definitions, these can vary among sources. With this in mind, let's begin.

Formulas and Terminology

Rating. The first term we'll tackle is *rating*. You may say, "But, we've already been talking about ratings." That is correct. The term is used for all the processes employed to predict viewing and listening habits. But

that is a more general definition of the term. More precisely, rating refers to the ~~*percentage of people in a given population who are tuned to a*~~ *radio or television* ~~*station during a given time period*~~. For example, the formula to determine a rating for a radio station is the population (television households are used in TV) divided into the number of people who are listening:[7]
listening:[7]

$$\frac{\text{Station's Listeners}}{\text{Population}} = \text{Rating}$$

Let's assume that the town of Elmsville has a population of 10,000 people and supports three radio stations. Using a random sample of the Elmsville population, we have projected that 1,000 people are listening to WAAA radio. Dividing 1,000 by 10,000 determines that WAAA radio has a rating of 10 percent.

$$\frac{1{,}000}{10{,}000} = 10\%$$

Share. Now let's consider another term—*share*. Share is also expressed as a percentage, ~~which is the number of a station's listeners~~ divided by ~~the number of *all listeners during a given time*~~ *period*. The formula for figuring share is:

$$\frac{\text{Station's Listeners}}{\text{Total Listeners}} = \text{Share}$$

Share does not determine the number of WAAA listeners by using the entire population of Elmsville, only those in Elmsville listening to radio. For example, when the survey was conducted, we found through sampling that between 3:00 P.M. and 7:00 P.M., only half, or 5,000 Elmsville residents, had their radios on. Thus, although we found that WAAA had a rating of 10 percent, its share was higher. In fact, the share for WAAA was 20 percent. Applying our formula, the 20 percent is reached as follows:

$$\frac{1{,}000}{5{,}000} = 20\%$$

Another way to understand share is to consider it as part of the listening pie.[8] For example, Figure 17–4 represents all of the Elmsville radio stations' listeners. Notice that WAAA occupies only 20 percent of the pie, and the other two stations have the remaining 80 percent.

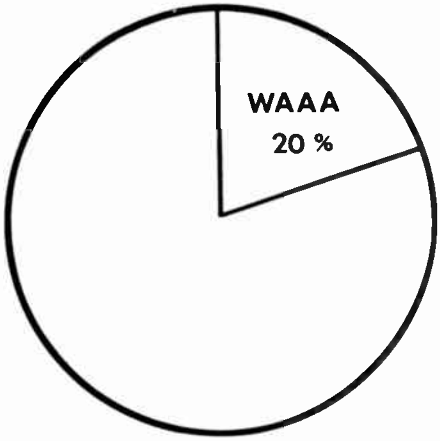


Figure 17–4 Of the total number of listeners, WAAA's share is 20 percent.

Average Quarter-Hour Persons. Now let's examine *average quarter-hour persons*, which is *an estimate of the number of persons listening to a station during any quarter-hour in a specified time period.* For example, many ratings are based on four-hour time blocks, such as 6:00 A.M. to 10:00 A.M. or 3:00 P.M. to 7:00 P.M. In radio, the morning time block covers the morning drive-time, and the evening block covers the evening drive-time. Time blocks can vary from market to market and from rating service to rating service. For television, the breakdown becomes more detailed, with time blocks as small as fifteen minutes. The smaller time block is necessary since television programming changes much more frequently than radio.

To define average quarter-hour persons, we'll use radio and the evening drive-time of 3:00 P.M. to 7:00 P.M. Remember, we are interested in average quarter-hour persons. Between 3:00 P.M. and 7:00 P.M. there are 16 quarter-hours (4 hours with 4 quarter-hours each). Let's assume that our random sample of Elmsville revealed that only 100 people from our sample were listening to station WAAA, and that those 100 people listened from 3:00 P.M. until 4:00 P.M. That means that they listened during four quarter-hours (four quarter-hours between 3:00 P.M. and 4:00 P.M.). We also know that each person in our sample represents 20 residents of Elmsville, since there are 10,000 people in Elmsville and our sample is 500. (10,000 ÷ 500 = 20.) Since our sample showed that 100 people were listening to WAAA, we can predict that between 3:00 P.M. and 4:00 P.M., 2,000 people were listening to WAAA (100 people from the sample multiplied by 20, the number represented by each person in the sample). Now to find WAAA's average quarter-hour persons between 3:00 P.M. and 7:00 P.M., we take 2,000 and divide it by 16 (the number of quarter-hours between 3:00 P.M. and 7:00 P.M.).

The answer is 125. Notice that our survey discovered that people were listening to WAAA only between the 3:00 P.M.-to-7:00 P.M. time block, and so projected those figures. We did this because when the ratings for Elmsville are published, all of the stations will compete in that same evening drive-time block.

"Cume" Persons. In determining the average-quarter hour persons, we also determined the number of *cume (cumulative audience) persons,* which was 2,000. Cume persons ~~*are the number of different persons*~~ *listening to a* ~~*station at least once during a given time period*~~. It refers only to a specific time period and only to people listening at least once during that period of time. We never count a person more than once when we are figuring cume. For example, if of the 100 people who were listening to WAAA between 3:00 P.M. and 4:00 P.M., our sample discovered that ten of them turned their radio back on and listened again between 6:00 P.M. and 7:00 P.M., we would not count them a second time during that evening drive-time block.

The easiest way to understand cume is to compare it to a magazine subscription. When figuring the circulation of a magazine, the subscriber is counted only once, regardless of how many times the magazine is read. After picking up the magazine in the afternoon mail at 3:00 P.M., the subscriber might read it until 4:00 P.M., fix dinner, and finish the magazine between 6:00 P.M. and 7:00 P.M.. Although he or she reads the magazine twice before finishing it, he or she still is counted as only one subscriber. The same applies to cume persons, the number of different persons who listen at least once during a time period.

There are many more terms and formulas than we have covered here. If you are interested in learning more about ratings, consult the "Spotlight on Further Learning" section at the end of the chapter or books on advertising.

An actual rating also entails many more subdivisions of data than those we have encountered here. You might compare women between the ages of 25 and 49 who listen between 3:00 P.M. and 7:00 P.M., or you might compare men between the ages of 25 and 64 who listen between the hours of 3:00 P.M. and 7:00 P.M.. A portion of an actual rating from an Arbitron survey of radio listening in Dayton, Ohio shows how a listener survey is displayed for broadcast clients (Figure 17–5).

The survey represents radio listening during the 3:00 P.M. to 7:00 P.M. time block on Sunday. Notice how the age groups for women are actually broken down into categories of 25 to 49 and 25 to 64 years of age. Other age-category breakdowns for both men and women are included in the complete survey. Not all of the stations listed are actually in the Dayton area. Some are in outlying areas while others, such as WKRQ and WSAI, are in Cincinnati, southwest of Dayton (Figure 17–6).

STATION CALL LETTERS	WOMEN 25-49 TOTAL AREA AVG. PERS. (00)	WOMEN 25-49 TOTAL AREA CUME PERS. (00)	WOMEN 25-49 METRO SURVEY AREA AVG. PERS. (00)	WOMEN 25-49 METRO SURVEY AREA CUME PERS. (00)	WOMEN 25-49 METRO SURVEY AREA AVG. PERS. RATING	WOMEN 25-49 METRO SURVEY AREA AVG. PERS. SHARE	WOMEN 25-64 TOTAL AREA AVG. PERS. (00)	WOMEN 25-64 TOTAL AREA CUME PERS. (00)	WOMEN 25-64 METRO SURVEY AREA AVG. PERS. (00)	WOMEN 25-64 METRO SURVEY AREA CUME PERS. (00)	WOMEN 25-64 METRO SURVEY AREA AVG. PERS. RATING	WOMEN 25-64 METRO SURVEY AREA AVG. PERS. SHARE
*WAVI	4	9	4	9	.3	2.6	14	22	14	22	.7	6.1
WBZI	4	23	1	9	.1	.7	12	31	9	17	.4	3.9
WDAO	19	44	19	44	1.3	12.4	28	53	28	53	1.4	12.3
*WGIC	9	10	9	10	.6	5.9	19	20	9	10	.4	3.9
WHIO	13	75	12	64	.8	7.8	19	100	18	89	.9	7.9
WHIO FM	26	54	12	24	.8	7.8	72	139	41	89	2.0	18.0
WING	31	71	31	71	2.2	20.3	32	79	32	79	1.6	14.0
WONE	26	64	17	35	1.2	11.1	34	94	21	52	1.0	9.2
*WPTW												
WPTW FM	4	8	4	8	.3	2.6	9	15	9	15	.4	3.9
TOTAL	4	8	4	8	.3	2.6	9	15	9	15	.4	3.9
WTUE	7	21	7	21	.5	4.6	7	21	7	21	.3	3.1
WVUD	5	19	5	19	.4	3.3	5	19	5	19	.2	2.2
WKRC	2	18	2	18	.1	1.3	2	18	2	18	.1	.9
WKRQ	6	22					6	22				
WLW	11	54	3	19	.2	2.0	18	76	3	19	.1	1.3
WSAI	7	31					7	31				
WWEZ	11	19	11	19	.8	7.2	19	46	13	27	.6	5.7

Figure 17–5 (Arbitron Radio)

The survey was of radio listening habits of the Dayton area, and some residents in that area listen to radio broadcasts from other communities, thus these stations are listed in the Dayton survey data.

Understanding the Concept of Survey Area

Figure 17–5 lists categories for both the total survey area (TSA) and the metro survey area (MSA). These represent the geographic areas from which the random samples were drawn. The TSA and MSA are determined by a combination of data, including the signal contours of the stations, audience listening habits, and government census data. The TSA is larger than the MSA, encompassing outlying areas. The MSA corresponds more closely to the actual "metropolitan" district of a city. Figure 17–6 represents this. In Arbitron's map of Dayton, look closely at the areas of white and the horizontal lines. The area in white is the TSA. In the display of listenership data in Figure 17–5, the TSA is on the two

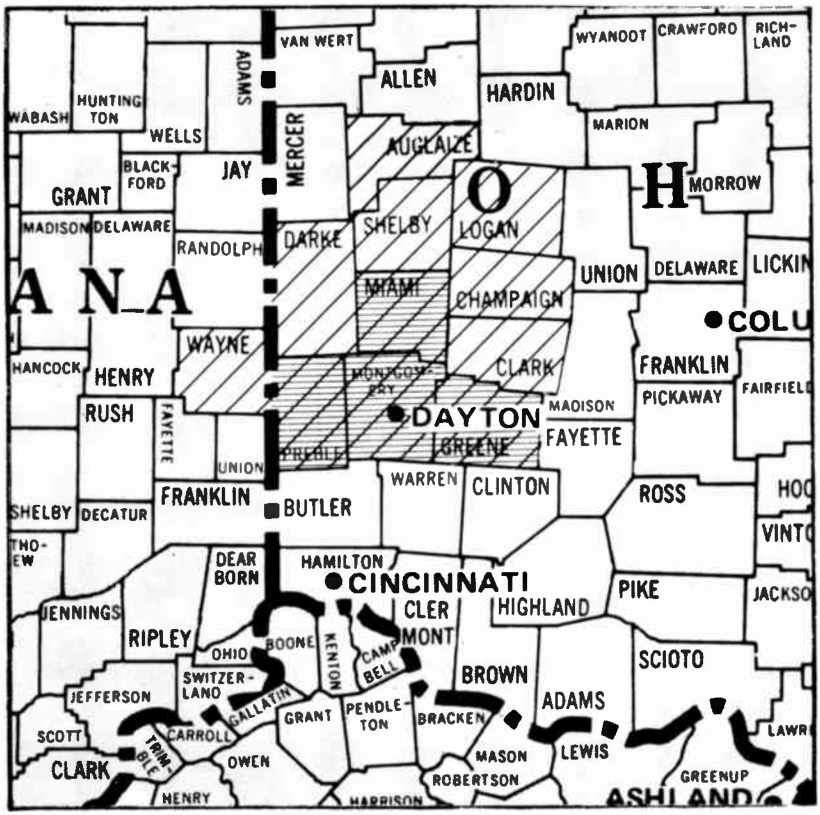


Figure 17–6 (Arbitron Radio)

columns on the left of each category. The area in which horizontal lines appear on the map is the MSA and is represented on the remaining four columns in the listenership data of Figure 17–5. The diagonal lines in the map represent the Area of Dominant Influence (ADI) which applies primarily to television viewing. It is an exclusively defined market area (no two ADIs overlap) of measurable viewing patterns.

Besides the terms we have already learned, you should know two more. The term *households using television* (HUT) refers to households in which one or more television sets are in use. *Television households* means households with at least one television set, but which are not necessarily in use at survey time.

applying ratings to management decisions

Ratings by themselves are not valuable. Their importance lies in how broadcast management uses them to make decisions.

If you were a television station manager and the ratings showed that your station was second in the local news ratings, you would have a number of alternatives. First you could do nothing, leaving everything as it is. Your station might be profitable, and you would see little need to change. Or you could replace your news department with different people. A third alternative would be to replace the news with another type of programming you feel would be more profitable. Whatever your decision, it could not be made without a careful analysis of the ratings.

You might find that although your station was second in the category of all adults 18 years and older, you had some other strength to offset this. You discover that among adults between 18 and 34 years of age, your station was first. The other station was reaching mainly adults 49 years and older. You are very satisfied with your station's showing in the younger group. It is an acquisitive group that still is forming buying habits and is making such major purchases as homes, home appliances, and automobiles.

Looking more closely at the ratings, you discover that for the time-slot immediately preceding local news, the ratings show the other station far ahead of yours. What does this mean? Perhaps the news department is not to blame for the second place showing as much as the program that preceeds the news is. Some viewers simply would rather stay in their comfy chairs than get up to change channels. So changing the program leading into the news may be all that is needed for your station to capture first place.

Ratings determine something else which your station's sponsors and advertising agencies will want to know—how expensive it is to reach an audience on your station compared to the competing station. The answer is in the cost-per-thousand (CPM). *Cost-per-thousand* is *the cost of reaching 1,000 people.* Let's assume that your station's rate card lists the cost of a one-minute commercial as $100. That same commercial on the competing station costs $150. Now let us assume that the Ace Garden Supply Co. wants to advertise topsoil to people 25 to 49 years of age. You examine your station's latest ratings and find that between 9:00 and 10:00 A.M., you are reaching about 12,000 viewers in the 25 to 49 year-old age bracket. But your competition reaches 14,000 viewers and has convinced the Ace people that they should buy advertising on their station. Now you compare the CPM of your station with that of the competition. First you figure your station's CPM by dividing the cost of your one-minute commercial by the number of people reached in thousands by that commercial.

$$\frac{\text{Cost}}{\text{Thousands of Viewers}} = \text{CPM}$$

Before reading further, substitute the figures from our sample rate card and ratings and figure the CPM. The correct answer is $8.33. You arrived at the $8.33 by dividing $100 by 12. If you did not get $8.33 you probably divided the $100 by 12,000. That would tell you how much it cost to reach just one person. But remember, CPM is the cost of reaching 1,000 people, and since there are 12 of those (12,000) we divide the $100 by 12.

Now you need to figure the CPM for your station's competition. To do this, divide $150 (the cost of the competition's one-minute commercial) by 14 (the "thousands" of people viewing). The answer is $10.71. Clearly the most economical way to reach the viewers is on your station! It is now up to you to convince Ace Garden Supply of that fact.

As a consumer of broadcast communication, you immediately will recognize that what you see on your television screen is the result of management's statistical scrutiny. A legitimate criticism of this decision making is that it creates bland programming to please the general public. That is true. Commercial broadcasting is business, and nowhere does this become more evident than in the use of broadcast ratings.

criticism of broadcast ratings and improvement of accuracy

Despite mathematical formulas and efforts toward accuracy, the broadcast ratings still receive considerable criticism. Some is warranted; some comes from ignorance.

Two Concerns: Sampling Error and Minority Audiences

One criticism of ratings is of the actual sample. Statistics tell us that although there may be a given sampling error for a random sample of an entire population, that sampling error increases as the population shrinks. For example, if you have an error of ± 4 percent for the total sample, that sampling error grows as you divide the sample into smaller units, such as those of sex or age. Although your total sample may have been 600 people, it may include 100 teenagers. Thus the sampling error for teenagers is based on 100, not 600.

There is much criticism of minority audience ratings. Since it usually is necessary for a station to reach a certain percentage of the audience before even being listed in the ratings books, those that reach small, specialized audiences can suffer. When the ratings do not show any listeners, an advertiser's reluctance to spend dollars is understandable. Some rating services use 10 percent listenership or viewership as the cutoff, below which a station is not reported. In a large city such as New York where there are approximately one-half million Spanish households, if each of these were tuned in to the Spanish station, it still would not be reported.[9]

Some criticism has made a difference. Arbitron withdrew a market report for McAllen-Brownsville, Texas after receiving complaints that the sample was not adequate.[10] The rating service attributed the problem to field staff members who helped viewers fill out diaries.[11] Rene Anselmo, president of the Spanish International Network, has charged that "both the Spanish and Black communities have been deprived of the variety and diversity of media to which they are entitled because rating practices have adversely affected the economics of minority-owned broadcasting."[12] There have been efforts to correct these alleged deficiencies, which include having diaries printed in Spanish and compensating more accurately for minority audiences.

Broadcasters have their own brand of rating service criticism. An Austin, Texas broadcaster complained about surveys of the Austin market. Examining the diaries used by one service, he was "particularly disturbed" that the people who were heads of households tended to be people over 50 years of age. He stated in his letter, "In one county, the average head-of-household age in the diaries was 60, in another county 65, and in still another county 62." He felt that "an accurate rating couldn't be taken from people in that age group when the over-all average is so much younger."[13] He went on to cite instances in which two different surveys of the Austin market differed substantially for the same time period.

The ratings received widespread attention in 1975 when Nielsen reported a significant drop in television use.[14] Then when the decline continued, finding out why a decline had taken place became more important than blaming the ratings for creating an artificial decline.[15]

The press has also leveled its share of criticism. The Associated Press reported the story of the man in Manhattan who became part of the Nielsen sample by not telling the rating service that his grandfather, the man they asked to complete the diary, had been dead for eleven years.[16] On another front, the Radio Advertising Bureau launched a task force to stimulate competition between services. The task force concentrated on improving the methods used in measuring radio audiences.

Working to Improve Broadcast Ratings

Because of the developments in cable television, people's changing lifestyles and the sophisticated needs of clients, there are continual efforts to improve the accuracy of broadcast ratings. Some of these efforts are credited to the services themselves, others to networks and broadcast associations. In the case of the latter, a state broadcasters' association complained to the Federal Trade Commission about a station which engaged in heavy promotion, called *hypoing*, during a rating period. Because of this complaint, the major rating services now include special notations within their reports that alert readers to any special promotions during the rating period which may have "artificially" increased the size of the viewing or listening audience (Figure 17–7).

In 1975, the three major commercial networks began developing monitoring systems to keep track of their affiliate stations' use of network programming. Remember that although a network program may be fed to affiliates, it is no guarantee that every affiliate is airing it. The affiliates may substitute something else. And although a meter attached to a viewer's television may record the channel being watched, it does not record the program being watched. Although the ratings showed homes were tuned to network-affiliate channels, the viewers may instead have been watching a local basketball game which preempted network programming. With the automatic monitoring system, the meter monitors the station and tells the rating service computer if the station is airing network programming.

Cable has been a particular problem for the ratings. Not only are channels from distant markets often preempted for local programming, but some cable operators also supply different stations at different times on the same channel. Such procedures keep the rating services hopping, and they continually attempt to distinguish the viewing habits of cable and noncable subscribers in their reports.

Figure 17–7

IMPORTANT STATION ACTIVITY
WAAA...

made direct reference to the current diary survey for this market. See page 5 for complete details.

ARBITRON RADIO

It has been reported to Arbitron that on Wednesday, January 12, 1977, direct reference to the current diary survey of Your City Market was made on WAAA's morning show from approximately 8:00 AM to 10:00 AM.

Ratings, the importance of ratings, diaries and Arbitron were discussed.

According to WAAA, this discussion was a direct result of an article titled, "John Doe Loses No. One Position", that appeared in Your City Press on Tuesday, January 11, 1977.

Rating services also are attempting to give their clients more demographic information. For example, Arbitron's Information on Demand Zip Codes gives clients such demographic breakdowns as income, education, occupation, and eighteen additional demographic characteristics (Figure 17–8). Such specialized target-audience measurement may revolutionize the station rate cards of the future. We may even see specialized rate cards for different sections of town, much like print-media circulation. If you own a neighborhood store in a high-income residential area, you may be able to purchase commercials based on your clientele's viewing habits. A television account executive may show you a ratings book which indicates that a special weekend sports program has a large viewing audience in your clientele's zip code area. You thus could receive a special advertising rate based on that particular program's "broadcast" circulation. It would be cheaper than the rate for reaching the entire viewing audience but perhaps more than you might pay for reaching a low-income audience. This specialized sales approach may become more common as cable television brings a multitude of specialized channels into our living rooms.

Some radio networks have arranged for rating services to base their radio surveys on the Areas of Dominant Influence (ADI) used in television ratings.[17] The problem in using a Metro Service Area (MSA) and a Total Survey Area (TSA) is accurately rating many of the smaller radio stations which are not in one of the larger metropolitan areas. Remember, for a station to be listed in a ratings report, it must have the minimum number of listeners for a metro survey area. As we learned previously, a station in an outlying community which does not have the minimum MSA audience may be left out of the rating (Figure 17–9). Even if an outlying station manages to reach one or more MSAs, most of its listeners would be outside the MSA, and adding the MSA audience would represent a much smaller audience than there actually is. Even if the TSAs are added together, it does not give a true audience measurement, since some of the audience would be counted twice and some three times (Figure 17–10). Using the ADI to measure the listenership solves all of these problems. Since ADIs do not overlap, the station that spills over into three different ADIs can add the listenership from each one to find out its total audience (Figure 17–11).

monitoring quality: the Broadcast Rating Council

Concern over the accuracy of the ratings and their influence on national programming prompted congressional hearings on the subject in 1963. The publicity of the hearings focused on the industry's need for a systematic, self-regulatory body to assure confidence in broadcast ratings.

Now we can Zip you the answers to these questions:

1 How does your early news perform in upper income zip code areas?

2 Does your prime-access program reach two-car families?

3 Do you reach more professional and managerial people than your competition?

4 Do you attract more educated viewers than your competitors?

AID (Arbitron Information on Demand) Zip Codes take you beyond sex/age demographics and give you viewing by income, education, occupation and 18 more demographic characteristics.

AID Zip Codes mean you're no longer limited to whole counties, groups of counties or sex/age demographics.

You can build custom pieces of geography based on selected "zips" to identify key customers for department stores or any other retail prospects.

AID Zip Codes is another industry first from Arbitron Television.

So take advantage of it...now.

THE ARBITRON ADVANTAGE

New York (212) 262-5175, Atlanta (404) 233-4183, Chicago (312) 467-5750, Dallas (214) 522-2470, Los Angeles (213) 937-6420, San Francisco (415) 393-6925

THE ARBITRON COMPANY a research service of CONTROL DATA CORPORATION

Figure 17–8

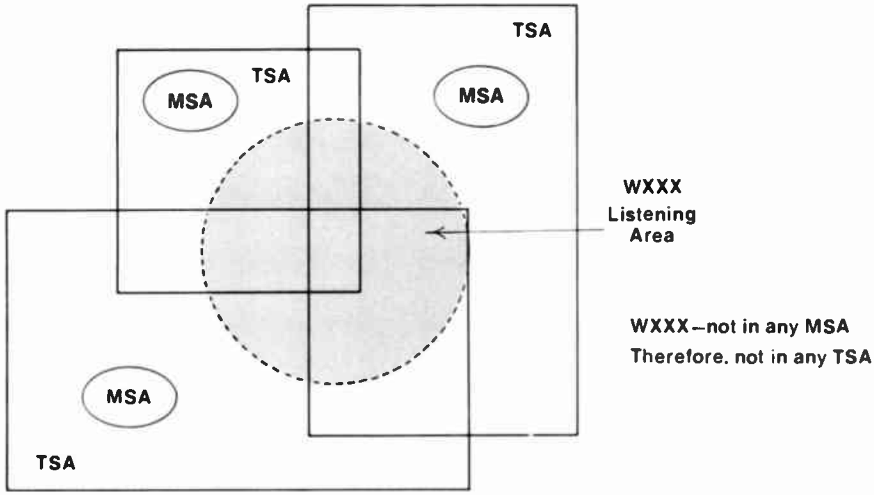
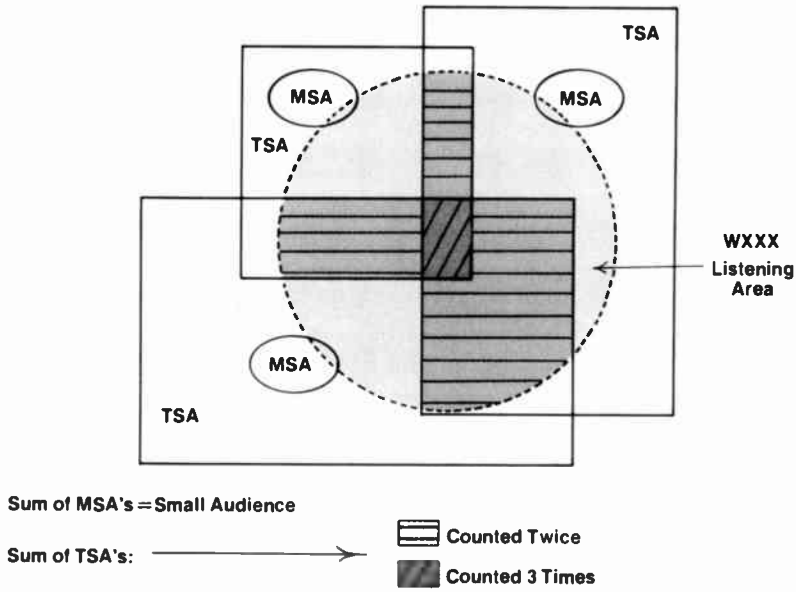


Figure 17–9 (Courtesy ABC Radio)

Thus, in 1963 the National Association of Broadcasters joined with ABC, CBS, NBC, and Mutual, with the blessings of the American Association of Advertising Agencies and the Association of National Advertisers, to form the Broadcast Rating Council (BRC). The council's main duty is to give the industry and the rating services credibility, assuring advertisers

Figure 17–10 (Courtesy ABC Radio)



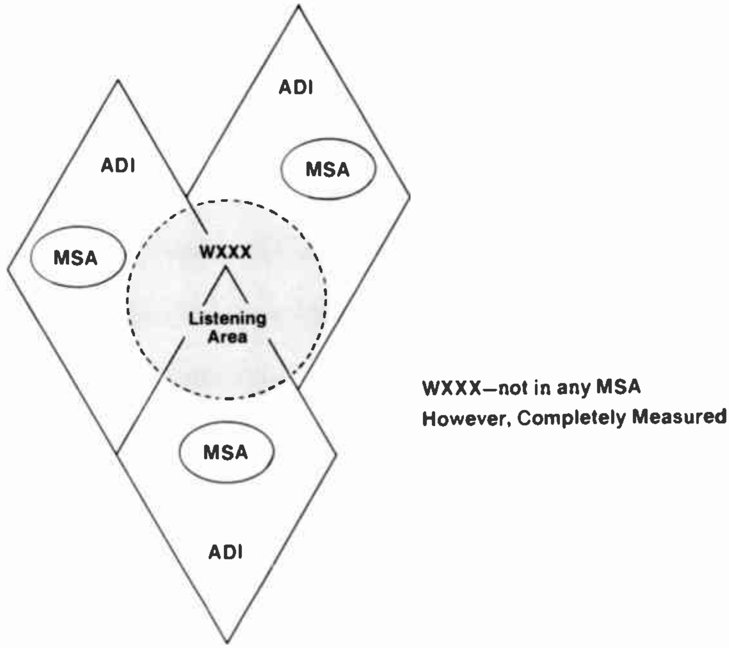


Figure 17–11 (Courtesy ABC Radio)

that radio and television indeed are reaching the audiences they say they are reaching. The BRC's charges state:

> *To secure for the broadcasting industry and related users audience measurement services that are valid, reliable, effective and viable; to evolve and determine minimum criteria and standards for broadcast audience measurement services; to establish and administer a system of accreditation for broadcast audience measurement services; to provide and administer an audit system designed to insure users that broadcast audience measurements are conducted in conformance with the criteria, standard, and procedures developed.*

Since its inception, the council has policed the rating services, either granting or revoking its seal of approval on them and their surveys (Figure 17–12). The BRC coordinates a major auditing process of rating services practices, paid for by the rating services themselves. These audits cover all phases of the rating process, from the development of sample design, the gathering of data, data processing, to the published reports. The audits are unannounced and cover various market areas selected by the auditors. In return for the council's accreditation, the accredited services agree to: (1) provide information to the BRC; (2) operate under substantial compliance with BRC criteria; and (3) conduct their services as they represent them to their subscribers and the BRC.

Accredited by
THE BROADCAST
RATING COUNCIL
Inc.

Figure 17–12

Technological advancements will undoubtedly affect rating services' future operations. In the experimental stages are a special exterior monitoring device which records a household's television viewing habits from outside the home, and a device which monitors the radio-station listening habits of passing automobiles.

Although the criticism continues, rating services still are the only source of reliable, economical, broadcast-audience data. And rating is done quickly. A network executive can walk into the office on Tuesday morning and find Monday night's ratings on the desk. A local broadcaster can obtain data on local listeners without having personally to conduct the ratings or to hire, train, and supervise someone else to do it. Continual efforts are being made by broadcasters, networks, and rating services alike to improve the quality of this important area of feedback for the industry.[18]

the future of broadcast ratings

The entire realm of mass communication is undergoing rapid change. It will become even more pronounced as audiences become more specialized, as the number of media increases, and as new transmission techniques such as fiber optics transform the broadcasting spectrum from a limited to an almost unlimited resource. On the future of the ratings, Professor Robert E. Balon speculated on a scenario in the year 2016 predicting that as many as 26 networks would be in operation. Those networks would be trying to gain a mandatory 3 percent share and would be running reruns of "Bionic Grandson." Viewers would have 30 to 40 shows to watch every half-hour on multiscreen television, developed back in 1996. Prime time would be from 4:00 P.M. until 2:00 A.M. and from 6:00 A.M. until 10:00 A.M.. Minute populations would be the target audiences with advertisers trying to reach 18 to 21 year-olds. Balon predicts that almost "nothing short of a total, daily sensory monitoring of hundreds of selected sub-populations will be acceptable."[19]

Ask yourself how our current as well as our future society fits into the ratings scheme. Do you feel, after learning about random sampling, that the ratings are an accurate gauge of national preference in television and radio? Would there be a better way to analyze the audience and make decisions affecting the content of broadcast messages? If we actually do reach a point at which daily sensory monitoring becomes necessary, would you volunteer to walk around with a mini-computer strapped to your wrist, sending data about your viewing and listening habits to a central data processing unit? What would be the ethical considerations of such a system? Would there or should there be a need for government control over such a system? Discuss these questions with your friends and begin thinking about your own broadcasting philosophy for the future.

summary

Chapter 17 examined broadcast ratings. We learned that they are a controversial subject and that the public does not always believe them. Ratings are only as good as the sampling procedure employed. Random sampling, in which each person or household has an equal chance of being surveyed, is important to accurate ratings. The larger the sample, the smaller the margin of error (sampling error), although a sample of 600 people is sufficient to create a margin of error of about ± 4 percent. Once the sample is drawn, every attempt should be made to gain the cooperation of as many people in the sample as possible. Data for broadcast ratings are collected by three methods: interviews, diaries, and meters.

We also learned some of the ratings terminology, including "rating," "share," "average quarter-hour person," and "cume persons." We examined the different survey areas. We looked at the total survey area (TSA), metro survey area (MSA), and area of dominant influence (ADI). Some radio networks have used ADIs, a survey area usually reserved for television, to measure network radio audiences.

When accurate and reliable ratings are available, management can use the data to make programming, personnel, and marketing decisions. Nevertheless, criticism of the ratings, of such things as an adequate sample and neglect of minority audiences, continues. In most cases, the major rating services continually try to improve their procedures to provide more reliable and accurate data for their clients. The quality of these major services and their samples is monitored by the Broadcast Rating Council (BRC).

spotlight on further learning

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18

the research process

FOCUS After completing this chapter we should be able to

Distinguish between historical, descriptive, experimental, and developmental research.
Grasp the scope of broadcasting research.
Discuss survey research common in local stations.
Describe how a network election poll is conducted.
Explain important procedures in reporting public opinion polls.
Describe new methods of data collection.

To the average undergraduate student, the word *research* is about as exciting as a flu epidemic. The word conjures up images of bloodshot eyes pouring over unsolved problems, stuffy laboratories with bubbling flasks, incomprehensible calculations, and all-night study sessions for impossible exams. Even related words can cause the research jitters—words like "theory," "numbers," "experiments," "statistics," or "computers."

The jitters would subside quickly if we stopped long enough to realize that we use research every day. We conduct research, we make decisions based on research, and we are affected by research. Turning to the radio-television section of the evening newspaper is a form of research. You survey the available programs and make a decision about which ones to watch or not to watch. When you decided to enroll in college you may have examined college catalogues, looked at college guides, written letters to different college admissions counselors, and even had on-campus interviews.

The professional researcher in a major television network does the same sort of thing everyday. He or she may look through back issues of annual reports to establish the image of the company, in much the same way you examined college catalogues. Letters might be sent to affiliate stations asking local managers to write back and describe network service. Just as you wrote to the admission counselors and studied their responses, the researcher will examine the managers' responses. If additional information is needed, the researcher may interview the manager over the telephone or even visit the station and talk to the manager in person.

Certainly broadcasting has much more complex and sophisticated research projects than these. However, with some training and the opportunity to conduct research projects of your own, you would be able to direct the same type of research common in many local broadcasting stations. So the next time the word research pops up, don't be afraid of it. By learning more about the broadcasting research process, you can open up a whole new frontier of exciting knowledge and experience.

types of research

We first should become acquainted with the different types of research, historical, descriptive, experimental, and developmental.

As the name implies, *historical research* is on the past. For example, you might conduct a research study tracing the history of one of the local radio stations in your community. Perhaps a local broadcaster is nationally famous as an industry pioneer. A study of his professional career would be an historical study. Historical studies are not necessarily on subjects which are "ancient" or "old." A research study of the first five years of WAAA radio still would be considered historical even though WAAA signed on the air in 1975.

Descriptive research describes a current condition. The most common descriptive research is surveys. A survey of local listenership or a survey of television sets in use are examples of descriptive research. In fact, descriptive research is one of the most common types in the broadcasting industry.

Experimental research is sophisticated research which entails a "controlled" experiment. For example, we might compare children's aggressive behavior before and after they watched violent television programs. We would select two groups of children. One group would watch a violent television program while another group might watch the same program but with the violent episodes deleted. We then would compare the actions of the two groups. Two terms used frequently in experimental research are *independent variable* and *dependent variable.* An independent variable is the factor which is manipulated in the research study. In our example, it is the violent episodes in the television program. The dependent variable refers to the phenomenon of change, which in our example is the children's behavior.

A fourth type of research is developmental. *Developmental research* is applied mostly to instructional television. The example of continually perfecting an ITV program on teaching tennis is an example of developmental research. In this type, certain objectives first are established. Then an instructional radio or television program is "developed" by producing, testing, revising, and retesting the program until it meets the stated objectives.

the scope of broadcasting research

Broadcasting research reaches nearly every facet of the industry. Aside from government research studies and those conducted by such research corporations as A. C. Nielsen, broadcasting research extends from colleges and universities to local stations.

Research in Colleges and Universities

Some of the most sophisticated research on every aspect of broadcasting is done in an academic setting. Many colleges have major research centers which concentrate on radio and television. Some of these are the

Communication Research Center, Broadcast Research Center, Division of Communication Research, Center for Media Research, and Institute for Communication Research. They are anything from depositories for current studies and scholarly research papers to centers which administer major research contracts examining everything from the social effects of broadcasting to technical problems associated with fiber optics transmission. Doctoral dissertations provide another opportunity for research as do research projects by students and faculty. Many individual studies appear in scholarly journals.

Research in academia is funded by a multitude of sources. Major foundations are active in funding broadcasting research, including the Ford Foundation, the Rockefeller Foundation, the Lilly Endowment, and the John and Mary Markle Foundation. The networks, corporations, and the federal government contract with institutions of higher learning to do research for special projects of interest to the funding organization.

The Networks and CPB

Although we are more attuned to their prime-time programming, the networks' research arms are an integral part of their total operation. Perhaps the most famous project was that started in the early days of CBS when the network hired an Ohio State University professor named Dr. Frank Stanton to conduct research on radio listenership. Stanton went on to become a CBS executive, and his research efforts remain firmly entrenched.

Even in the networks' early years, research was clearly defined. Duties assigned to NBC's research department in 1948 included five areas which were to be developed under a "Master Plan for Television Research":

1. The audience: its size, characteristics, and viewing habits.
2. TV stations and their coverage.
3. Programs: the contribution of research to their better selection and presentation.
4. Advertising: measuring TV's advertising effectiveness.
5. The social impact of TV: its effect on the family and children, the psychological effects of TV, public attitudes toward TV, and TV as an educational medium.[1]

Thomas E. Coffin, who currently directs NBC's research, feels that some of the recent changes in NBC research have included the ability of research to communicate more effectively with creative people—news and program executives, personnel in program development, producers, and NBC's advertisers.[2] In turn, creative people are finding new ways in which research can help them, the result being that more and more research is devoted to "reality problems."

Noncommercial broadcasting also does much research. The Research Office of the Public Broadcasting Service conducts research in the areas of system information, system finance, and audience evaluation.[3] The research office offers six services: (1) to be a source of information for stations and other PBS departments using federal monies distributed by CPB to public stations; (2) to coordinate information on program funding and to calculate such information as PBS broadcast hours, hours of programming produced by independents, programming acquired from foreign producers, programming sold to foreign countries, and programming hours intended for or on minorities and women; (3) to answer information requests from such places as other PBS departments, Congress, the White House, the public, the press, and book publishers; (4) to measure the extent of usable signals transmitted by public television stations and the demographic breakdown of the population in each signal area; (5) to provide prompt accounting of each affiliate station's use of PBS programs; and (6) to publish reports on PBS activities.

Although it is not a network, the Office of Communication Research at the Corporation for Public Broadcasting both conducts research itself and contracts for research studies which benefit noncommercial public stations. The office keeps abreast of current research, both in and out of public broadcasting, and disseminates and interprets this research for public broadcasting stations (Figure 18–1).

Local Stations

Although we usually do not think of local stations conducting research, virtually all do in some way or another, from community needs and ascertainment surveys to advertising effectiveness studies. In its publica-

Figure 18–1

cpb **News Briefs**
Office of Communication Research

Vol. 1 - NO. 3 **Date:** OCTOBER 14, 1977
Subject: TELEVISION AUDIENCE 1977

We have just received A. C. Nielsen's Television Audience 1977, their annual report on the state of the medium. We want to share with you some of the highlights on the general trends in TV ownership, population growth and station growth.

OWNERSHIP

- As of September 1, 1977, the total number of U.S. households was estimated at 74.7 million. 98% of these households (72.9 million) have at least one TV set.

More th

tion, *A Broadcast Research Primer*, the National Association of Broadcasters gives some examples of applied research which can be conducted by local broadcasters with some research background. They are: (1) how many radio or television sets are in the market served by the station; (2) the size of the station's audience; (3) what share of the total listening or viewing audience the station has; (4) the demographic characteristics of the audience; (5) the buying habits of the audience; (6) the use of products and services, such as how many people who use a certain product also listen to or watch the station; (7) how the station's coverage compares to the coverage provided by competing media; (8) researching audience reaction to station programming; (9) evaluating the effectiveness of air personalities; (10) determining the image of the station, which in many ways also includes #8 above, what the public thinks of the programming; and (11) conducting public opinion polls.[4]

survey research common to local stations

The research areas listed above are mostly examples of descriptive "survey" research. Partly because survey research is more easily interpreted and applied than other types, it is the type most often used by local stations. Let's now look more closely at the methodology used to conduct two of the most common types of broadcast surveys: the FCC required community needs and ascertainment survey and the station image survey.

Pitfalls in Community Needs and Ascertainment Surveys

In chapter 14 we learned how to conduct a community needs and ascertainment survey as required by the FCC. Now let's examine that survey procedure more closely to understand why research processes are important to station management. As a manager of a station you could select representatives from the nineteen community groups and interview them about the community. However, you might very well miss some of your most important listeners, groups which are not part of the mainstream of society. Let's look at one example, the "voiceless" community.

Researchers Orville G. Walker, Jr., and William Rudelius of the University of Minnesota examined the procedure for reaching this "voiceless" community. They defined these "voiceless" groups as, "people with a common problem who were not formally organized and who had no widely recognized leaders or spokesperson in the community."[5] The two researchers classified these groups into three categories.

The first category is the *Past-in Future-out* groups. These people were once in the mainstream of society but now watch from the sidelines. They include such people as the elderly, mental patients, and the deaf. The

FCC ascertainment guidelines make provisions for the elderly. But Walker and Rudelius found that others were equally concerned about medical facilities for the mentally ill or special captioned subtitles on television programs for the hard of hearing, yet did not voice these concerns. No one had asked them.

The second category is the *Past-in, Future-in* groups. Here would be found such people as "runaway teenagers, unwed mothers, VD victims, and prisoners." This group was in the mainstream in the past and intends to return in the future, once physical or personal problems are overcome. Although the Minnesota researchers found these people did not need communication from broadcasters, the unwed mothers wished for information on special parental care, and the prisoners wanted educational programs.

The third group is the *Past-out, Future-out* people, those who are minorities because of race or disabilities. They felt "more or less permanently removed from the mainstream of American life because of a lack of understanding or outright discrimination." The FCC ascertainment provides for reaching racial minorities and women, but ends there. The two researchers discovered that the principal desires for these groups were to have their story told, and for broadcasters to communicate the negative misconceptions and stereotypes that had been attached to them in the past.

Walker and Rudelius also pointed out that, consistent with the Past-out, Future-out groups' "desire for a more realistic and truthful portrayal of their cultures and lifestyles, most of these groups expressed a very strong desire for greater influence over the creation and execution of television programs about themselves." In other words, these groups were not satisfied with the type of messages being directed toward them. To these groups, media access was important. "Consequently, they see creative control and active participation—both in front of and behind the cameras—as the only guarantee that a television program or series would accurately reflect their viewpoint."

Station Image Surveys

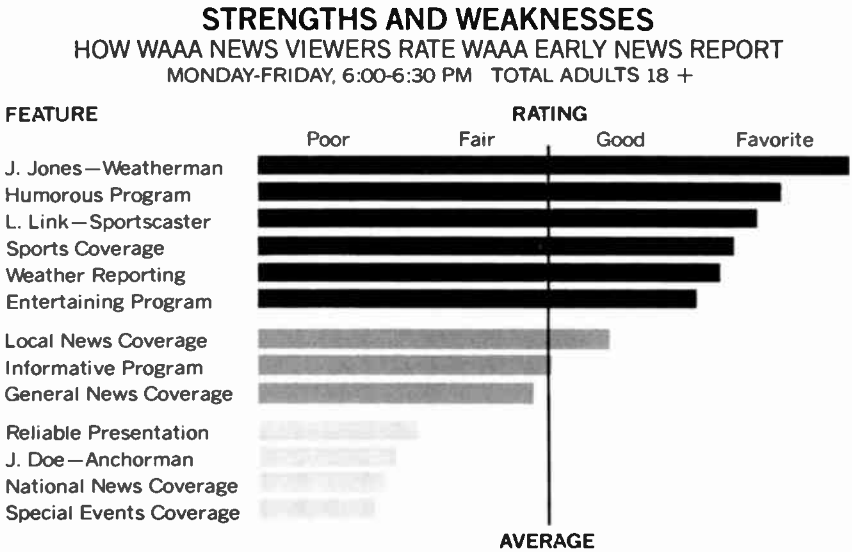
Besides discovering what people think of their community, broadcasters are also interested in finding out what people think of broadcasters. One way of determining this is to conduct station image surveys. These surveys can be combined with ratings for an in-depth look at how the audience perceives the programming.

Imagine that you are managing a television station, and that you discover that certain programs are not getting a satisfactory share of the viewing audience. But you do not know why. Ratings tell only who is viewing what and when. They do not tell why a person likes or dislikes a certain program. A station image survey seeks to find out why people do or do not watch or listen to a station. It explores such nebulous areas as attitudes toward and opinions about programming and personalities, and it helps management make decisions. For example, if you discover that a program is being watched by a large share of your audience but find in a station image survey that the audience actually rates the program very low, then you could have a problem. The audience may be watching that program only because the competition is airing even more dismal programming. If the competition were to change their offerings and insert a popular program instead, you could have your audience swept away overnight.

Consider an example from radio. Assume that you are the program director of a radio station in a rather large market. You discover that although you seem to be capturing a large share of the audience for most of the broadcasting day, that share tends to dip during the local news. Why? You have already conducted research comparing the number of stories your news department with those in the rest of the stations in your market. You know your station has been consistently ahead of the others. So you decide to design a station image survey (Figure 18–2).

First you decide to determine if the audience even recognizes the name of your station's news director. Then you include a series of open-ended questions on why or why not people listen to your station's local news. From these questions, you will try to isolate those factors which are hurting the ratings.

Figure 18–2 (Arbitron)



You discover that the public perceives your news director as being the only local news person employed by your station. Although you have a full staff of reporters, the audience is not aware of it. Second, you discover that the public thinks the competing stations cover national news much better than your station does. Finally, you find out that when there is fast-breaking news, the audience consistently turns to other stations.

A bit shocked by the results, you swallow your ego and go to work. Fortunately, you are too smart to fire the news director. If you did, you might lose the audience you already have. Besides, your budget does not have enough funds for a new publicity campaign necessary to announce the hiring of another director. You decide to develop the talent that is there.

Actually, your problem is not serious. You already have a fine staff of reporters. You just have not been using their voices on the air. When they cover a story, they have been telephoning the facts back to the news director, who then writes and airs the story. That now will change. You will have the field reporters phone in and record their reports, which then will be played back in the local news.

The national news programming is another problem. You cannot afford to hire additional reporters to cover national news. But your station does subscribe to one of the wire service audio networks. Each day the network feeds to its subscribers a series of correspondents' reports from around the nation over its telephone hookup. You have not been paying much attention to these reports since you air the regularly scheduled network newscast at the top of each hour. That also will change. You now will have the news director record those feeds and insert one or two of them in each local newscast.

Finally, to overcome the fast-breaking news problem, you will try to include a live, on-the-scene report from one of your reporters in every local newscast. For example, in the middle of the local news, the news director will switch live to the reporter at city hall, or one covering a fire. You also will have your news staff call the station and interrupt the regularly scheduled programming whenever important news breaks in the city.

Six months later, you begin to see the fruits of your labor. Your share of the local news audience now equals that of the rest of your programming. Although it is too early to tell, you see signs of an actual increase in that figure for your early evening newscast, meaning that people are tuning in especially to hear the news on your station. Without the station image survey your station's news might still be in the cellar.

Methods of collecting data for image surveys are as varied as the surveys themselves. However, remember that most station image surveys are designed to dig deeper than the ratings do. Figure 18–3 is a portion of a questionnaire used by WFIU in Bloomington, Indiana. Notice that

In order to assist us in evaluating how effectively we are serving our audience's needs, would you please take a few minutes to rate our programs. Any comments you wish to make will also be welcome.

PROGRAM TITLE	**Ranking**				
	Low				High
Afterglow	1	2	3	4	5
Afternoon Concert	1	2	3	4	5
Alec Wilder & Friends	1	2	3	4	5
All Things Considered	1	2	3	4	5
Boston Symphony	1	2	3	4	5
Chamber Music	1	2	3	4	5
Chicago Symphony	1	2	3	4	5
Cleveland Orchestra	1	2	3	4	5
Duke Ellington	1	2	3	4	5

Figure 18–3 (WFIU)

the respondent has five different choices for each program. This is much more detailed than merely asking if that person does or does not listen to the program. Sophisticated computer analysis of this type of questionnaire can tell which programs are popular and how they compare with other programs.[6] Similar questionnaires can reveal how an audience feels about the station's hours of operation, the overall selection of programs, news coverage, and scheduling.

The semantic differential scale is another sophisticated instrument often used in station image surveys.[7] These scales use a series of bipolar adjectives, such as bad-good or like-dislike. Each bipolar adjective is separated by an odd number of spaces, usually between five and eleven, permitting the respondent to mark an *X* in the "semantic space" between the two adjectives. Numerical values then are assigned to each space. For example:

Qualified _____ : __X__ : _____ : _____ : _____ : _____ : _____ Unqualified
Inexpert _____ : _____ : _____ : _____ : __X__ : _____ : _____ Expert

If this scale measured an audience's reaction to a television newscaster, the newscaster's score would be 11. We got this score by adding the numbers corresponding to the appropriate spaces between the bipolar adjectives:

Qualified	7 :	6 :	5 :	4 :	3 :	2 :	1	Unqualifed
Inexpert	1 :	2 :	3 :	4 :	5 :	6 :	7	Expert

The highest number, in this case 7, corresponds to the positive adjectives of "qualified" and "expert." In our example, we reversed the adjectives, placing the positive ones at opposite ends of the scale, "qualified" on the left and "expert" on the right. By randomly alternating the position of the adjectives in longer questionnaires, we prevent someone from carelessly marking *X*s down one side of all the scales.

Semantic-differential scales are used most effectively with a statistical procedure called factor-analysis, which "factors out" and "clusters" the scales which correlate with each other. These groups of scales are called *dimensions* and can tell us a great deal about people's perceptions of everything from station personalities to musical programming. For example, if we are programming a hard-rock format on radio and find in a station image survey that our listeners prefer programming that falls into those "dimensions" appropriate to classical music, then we might revise the format to soft rock. We may find that a competing newscaster has certain "dimensions" based on our analysis of a semantic scale. The newscaster also receives the highest ratings in town. In analyzing the personnel in our own news department, we find that one of our street reporters is perceived by the audience as having very similar dimensions to the popular newscaster. We move the street reporter to the anchor desk, and the ratings immediately improve.

Many more data-gathering instruments are available than the two mentioned here. All are designed to provide an in-depth look at how the audience perceives the station in everything from its standing in the community to its programming.

Sales and Marketing Surveys

The sales manager had worked for months on the account. But the drugstore owner was convinced the newspaper was the only place in which to advertise and could see no reason whatsoever for trying the broadcast media. Finally after repeated calls, explanations, gentle persuasion, and a few lunches, the druggist decided to sponsor the local news. He demanded, however, that he be allowed to write the commercials and have an announcer at the station record them. The copy that reached the station told how long the drugstore had been in the community, how loyal its customers were, and the excellent service it provided. Now it was six months later and time to renew the contract. What the sales manager suspected happened. The drugstore canceled the account. The druggist claimed he just did not see how the commercials could increase sales. When he ran ads in the newspaper, the item he listed always sold out. The sales manager persuaded the druggist to try one more week of commercials, only this time to let the station write the commercials with the druggist's approval. It was June, and the sales manager suggested advertising a special suntan oil. He also convinced the druggist not to advertise the suntan oil in the newspaper. The commercial started on Monday, and by Wednesday afternoon the drugstore was out of suntan oil. The druggist extended the contract for another six months and took a new look at advertising on the broadcast media.

Our example shows the importance of another type of research—sales and marketing surveys.[8] The sales manager surveyed the marketing mix used by the drugstore and discovered that the tactic of advertising a single product generated noticeable sales. The manager used this information, and the result convinced the client to renew his contract. Monitoring sales is just as important to broadcasters as station image surveys and community needs and ascertainment surveys are. Some broadcasters would argue that it is even more important.

behind the scenes of a network election poll

"They told me at the doughnut shop we had a reporter from NBC here, and by golly we do!" The pollster looked up from her interviewing sheets to see a weathered farmer in bib-overalls smiling as if he had just reaped the biggest corn harvest in three counties . The woman's quick explanation that she was just freelancing for NBC as a precinct pollster for this election day did not seem to bother him in the least. It was obvious that his stories of meeting a real live "network person" in the flesh would be heard in front of many a crackling fire.

Planning and Pollster Selection

Public opinion polls in radio and television are mainly the domain of the broadcast journalist and are usually concentrated around election time. We take for granted the election night predictions of state and national winners only a few hours after the polls close, predictions made before all the votes are counted. We no longer sit in amazement as computers, network commentators, and sample precincts determine the fate of democracy. We expect it.

What is behind these public opinion polls? It all starts in the network planning rooms, where statisticians and polling experts pour over mounds of computer data, analyzing voting trends in every state. How many people voted in which county for what candidate? How do these figures correlate with state and national voting trends? Do they correlate often enough to be a sample precinct, those tiny subdivisions of each community used to predict winners long before the local election officials finish their work? Sample precincts may be in the heart of Los Angeles or a tiny Maine fishing village. They are chosen by the same random sampling techniques we learned about in broadcast ratings. Together, they become part of the state-by-state predictions that call the election of senators, congress-persons, governors, and presidents.

Equally critical to the election poll are the precinct pollsters selected by the networks to interview voters. Some of the pollsters are associated with a broadcasting station in that area and are "invited" by the network to represent it at the polling place. At the network's office in New York, other people are in charge of coordinating this national group of "volunteers," who will receive a modest fee for their day's work. Coordinating a national core of pollsters and providing "training" by mail are a big job and one which must be carefully planned and executed.

Imagine yourself as an interviewer participating in a network election-day poll. What will your job be like? It will actually start about a month before the election with a call from a network executive asking you to represent the network as a precinct pollster. About two weeks later, you will receive a large packet of instructions. You will be asked to read the instructions carefully and to call a special telephone number if you need advice or if something unexpected happens. The number belongs to a special state supervisor, also hired by the network. The instructions will list where you will conduct the polling, giving you the exact precinct and voting location, and the name and telephone number of the local precinct official, suggesting that you contact that person before election day. Since you are just one part of a national systematic effort you will be asked to follow the directions very carefully. You have two responsibilities (1) to conduct the poll and (2) to report the results to the network.

Each pollster is assigned certain time periods in which to conduct the precinct poll. For example, you might be assigned to interview people coming out of the polling place between 6:00 A.M. and 9:00 A.M., calling in your first set of results to the network at 9:15 A.M. The second interview time might be in the afternoon between 12:30 P.M. and 1:30 P.M., and you would call in your second report to the network at 1:45 P.M.

You also will be told which sequence of voters to interview, such as every fifth or every third voter. The intervals are different for different precincts, depending upon their size. Your instructions would also tell you your quota of completed interviews, such as 30 completed interviews within those two time periods.

Conducting the Poll

Finally election day arrives. In the predawn darkness, you start your drive to the polling place. You leave early, in plenty of time. We shall assume that you have been assigned to a precinct in a small, outlying rural area. The morning sun is just barely coming up when you roll into the sleepy little town. You pass an old general store, a gas station, and a cafe where a few people are downing their first morning coffee. The precinct voting place is in the town library. You have seen them before, one of the old Carnegie structures with an American flag outside. Inside, the precinct workers all are ready for the first voter. You are greeted by the local precinct official you talked to earlier on the phone. She eyes your official NBC badge and asks:

"How about a cup of coffee and some of Mabel's cookies?" You accept and begin to wonder what the day will bring.

"Who are you going to interview?" she asks.

"Well I'm supposed to interview every third person, starting with the first one to vote after 6:00 A. M."

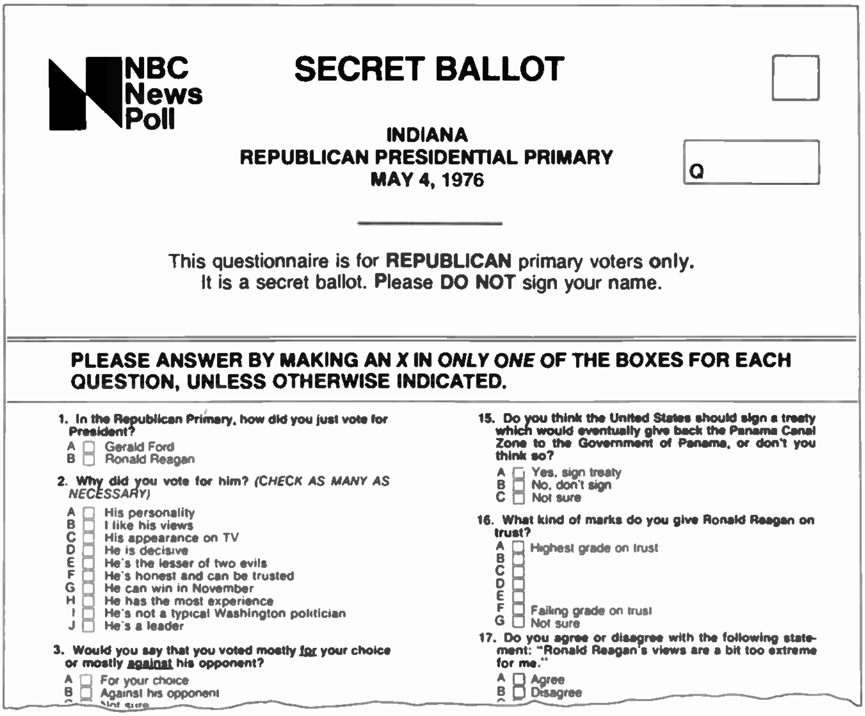
Before the precinct official answers, Mabel interrupts, "I'll tell you who that's gonna be." She has a big grin on a complexion revealing years of hard toil and farm life. "You can betcha Harvey Clodfelter will be the first through that door. Twenty years and he ain't missed being first yet."

You sense that election day is one of those special days ranking with the church suppers, the day of the school picnic, and the beginning of the county fair. It seems light years away from the network control center in New York where computers and statisticians are adding the finishing touches for the marathon telecast to follow later that night.

But here is where it all begins. You begin, sure enough, with Harvey Clodfelter. Your day will be filled with Harveys. They will ask you who you are, where you live, why you are there, and when you will be back. They will offer you their own brand of election philosophy, tell you why this candidate or that candidate will win, why the electoral college should be abolished, and complain how the big city folks are going to sway the election. To each of them, you will give a special ballot, similar in some ways to the one they have just completed (Figure 18–4). The ballot will be labeled SECRET BALLOT, and when they have finished filling it out, they will put it in a big envelope. You later will open that envelope and tally the results.

The ballot requires much more detailed information from the respondent than merely for whom the person voted. It asks the voters whether the TV debates affected their choice, who they voted for in the last presidential election, their ethnic background, the occupation of the head of their household, and such basic demographic information as age and sex. The ballot also asks what issues influenced their decisions, what the candidates' positions on the economy and foreign policy are, and whether those positions affected their decision.

If Harvey Clodfelter, as your chosen first person to finish voting after 6:00 A. M., refuses to be interviewed, then you continue counting until the next interval is reached. Remember, your goal is to interview the



NBC
News
Poll

SECRET BALLOT

INDIANA
REPUBLICAN PRESIDENTIAL PRIMARY
MAY 4, 1976

Q

This questionnaire is for **REPUBLICAN** primary voters **only.**
It is a secret ballot. Please **DO NOT** sign your name.

PLEASE ANSWER BY MAKING AN X IN *ONLY ONE* OF THE BOXES FOR EACH QUESTION, UNLESS OTHERWISE INDICATED.

1. In the Republican Primary, how did you just vote for President?
- A ☐ Gerald Ford
- B ☐ Ronald Reagan

2. Why did you vote for him? *(CHECK AS MANY AS NECESSARY)*
- A ☐ His personality
- B ☐ I like his views
- C ☐ His appearance on TV
- D ☐ He is decisive
- E ☐ He's the lesser of two evils
- F ☐ He's honest and can be trusted
- G ☐ He can win in November
- H ☐ He has the most experience
- I ☐ He's not a typical Washington politician
- J ☐ He's a leader

3. Would you say that you voted mostly <u>for</u> your choice or mostly <u>against</u> his opponent?
- A ☐ For your choice
- B ☐ Against his opponent

15. Do you think the United States should sign a treaty which would eventually give back the Panama Canal Zone to the Government of Panama, or don't you think so?
- A ☐ Yes, sign treaty
- B ☐ No, don't sign
- C ☐ Not sure

16. What kind of marks do you give Ronald Reagan on trust?
- A ☐ Highest grade on trust
- B ☐
- C ☐
- D ☐
- E ☐
- F ☐ Failing grade on trust
- G ☐ Not sure

17. Do you agree or disagree with the following statement: "Ronald Reagan's views are a bit too extreme for me."
- A ☐ Agree
- B ☐ Disagree

Figure 18–4

first, third, sixth, ninth, and twelfth voter, on down the line. It is a hard day. Some local people do not trust "outsiders," and you get completed interviews from only three of those chosen people. Nevertheless, you keep working toward your quota. You make certain you offer a questionnaire only to those people who have actually voted. That is one advantage the election day polls have over preelection polls. You can control your sample to include only people who have voted. You are also careful not to interfere in any way with the actual election process: voting and checking voter registrations.

So as not to influence the results of your poll, you try to remain polite while at the same time refraining from talking about candidates, issues, political beliefs, or other things which might bias the results. The only information you will supply is on the mechanics of completing the secret ballot; you will not want to answer any requests for political information. If a person does not understand a question or the directions, a polite suggestion to reread the ballot, not your rephrasing of the question or directions, is necessary. In other words, you will not want to influence, either by word or action, the response of the person being polled.

At precisely 9:15 A.M. you walk up the stairs to the library's office and call New York with the results of your first poll. You are careful to make sure every item is understood by the data collector.

To help ensure this, you will use word identifications for each of the possible answers: A = Alpha, B = Bravo, C = Charlie, D = Delta, and so on. A typical conversation, as explained in NBC's guide to its precinct pollsters, might go like this:

NBC Operator: "NBC. Your location code, please."

Interviewer: "This is Ohio, location 400."
The NBC Operator then will repeat your code, and give you the corresponding name of your polling location, to be sure we have the correct information.

NBC Operator: "I'm ready for the answers."

Interviewer: "Question One, Alpha."

NBC Operator: "One, Alpha, O. K. Go ahead."

Interviewer: "Two, Charlie."

NBC Operator: "Two, Charlie, right."

Interviewer: "Three, Delta, etc."

You then walk back down the stairs, nibble another cookie, and wait until you can repeat the procedure at your specified 12:30 P. M.

In New York, the data from your poll and those of other pollsters scattered throughout the United States are fed into a computer which tabulates them and predicts the winners. So why does the network not start predicting at noon on election day? The answer to that is a matter of geography. Since the West, because of the time difference, votes later than the East does, such predictions could influence western voters. A news report stating that a certain candidate has won by a landslide in New York may convince people in California that they also should vote for the probable winner. On the other hand, that news might make the candidate's California supporters complacent to the point at which they stay home and "give" the opponent the election. Let's examine this reporting process more closely.

reporting public opinion polls

As either a consumer of broadcast communication or someone who will someday report polls, you should be aware that there is more to an opinion poll than just the results. Many times, a gullible public and press are the object of persuasion campaigns based on public opinion polls. Broadcast journalists, partly because of the time restrictions placed on them, find reporting all of the pertinent data of an opinion poll to be difficult. So the following could very likely happen. A wire service story reports that a senatorial candidate is leading his opponent by twenty percent. The radio station reports the story, only to find out later that the poll consisted of 25 people who stopped by for coffee at the candidate's office. The sampling error alone would make the results questionable, to say nothing of the probable bias. We can assume that anyone who takes the time to have coffee at a candidate's office is not vehemently opposed to the person.

Reporting public opinion polls can be just as important, perhaps more so, than conducting the poll. The American Association of Public Opinion Research (AAPOR) and the National Council on Public Opinion Polls (NCPP), have adopted guidelines for reporting public opinion polls. An emphasis on "precision journalism" also has fostered more responsible and intelligent interpretation of polls.[9] Other guidelines have been offered by both journalists and educators (Figure 18–5). The aim of this attention is to educate the public and the media in the polling process. Even if the press is unable, because of space or time limitations, to report all of the factors in a poll, it should be able to decide intelligently whether

Figure 18–5 (*The Quill*, published by the Society of Professional Journalists, Sigma Delta Chi.)

CHECKLIST—
WHAT TO LOOK FOR IN A POLL STORY:

- ✔ *Was a probability sample used?*
- ✔ *Who sponsored, and who conducted, the polling?*
- ✔ *Is the population sampled adequately defined?*
- ✔ *How were those polled contacted—by mail, by telephone or in person?*
- ✔ *Is exact wording of questions specified?*
- ✔ *How many people were surveyed?*
- ✔ *Is it clear when analysis and interpretation concern only part of the full sample?*
- ✔ *Does the story specify an error margin for results, and does interpretation outrun that error margin?*
- ✔ *Does the story provide data to compare the sample with demographic characteristics of the population from which the sample was drawn?*
- ✔ *Is the headline or teaser accurate?*

even to use the poll, and if used, whether it warrants detailed interpretation.

What are the important considerations in reporting polls?[10] First is the sample. If it is not a random probability sample, then it may be questionable. In other words, for the poll to be credible, the probability of one person being selected is equal to that of all other people who might be selected. If the sample covers only your state, then it is not good sense to apply these predictions to the entire country. A second important consideration is who sponsored and conducted the poll. A poll favoring a democratic governor which is sponsored by the state's democratic committee and conducted by democratic precinct workers legitimately would be suspect. Third, it is important to define the sample population. If a poll taken among Maine voters states that the senator from Maine has a 60 percent chance of winning his party's nomination for president, the chances are that the estimate is inflated. Knowing who was sampled permits a better judgment of the poll's results.

A fourth consideration in reporting polls is how the people were contacted. A telephone survey of poor families would automatically eliminate all those who could not afford to have a telephone. Fifth, it is important to know what questions were asked. "Will you be voting for our fine Senator Claghorn?" will elicit answers favoring Senator Claghorn. Sixth, to determine the margin of error, it is important to know how many people were surveyed. Seventh, the poll should state if a subsample is used to interpret the findings. For instance, a poll may be reported to have a sampling error of ± 4 percent, based on a random sample of 600 people. However, if 50 of those people were Indians, it would not be correct to predict how the Indian population would vote and still claim the sampling error was ± 4 percent. Because only 50 Indians were sampled, the margin of error would be closer to ± 14 percent.

Eighth, it is important to report the error margin. Merely knowing what it is but not telling the listening or viewing audience has little purpose. Error margins are one of the easiest and best understood factors in an opinion poll. If you claim that a candidate has a 5 percent edge over his opponent and do not tell the public that the margin for error is 10 percent, then you have misled them. Moreover, if you predict a winner when the margin of error makes it actually too close to call, then you also have misled the public. A ninth important item to include in reporting polls is how the sample compares with the total population. If the population is 50 percent Hispanic, yet only 33 percent of your sample is Hispanic, then you would be asking for trouble by predicting the election without compensating for that variation. Tenth, it is important to consider the all-important headline. People can be persuaded by headlines. The radio or television reporter who announces, "Opinion poll predicts Senator Doolittle will sweep the state," and then comes back after the commercial to report a poll of the senator's precinct workers, has been irresponsible.

Keep in mind that public opinion polls are not foolproof and can be used incorrectly. The key is to understand them and know their pitfalls. The broadcast manager who editorializes in favor of a candidate may be in hot water if he bases that support on a sloppy opinion poll. A television news director who sends her staff out to conduct an opinion poll on election eve and violates all the rules of random sampling, is asking for trouble if she reports the results of the poll as being representative of the total population. Take the opportunity to read more about opinion polling. Design a sample poll. Ask yourself if it meets all of these criteria. Would you be able to draw general conclusions from your results?

new forms of data collection and approaches to research

New technology is accelerating the polling process even beyond the computer analyses so common in today's surveys. It will give broadcasters the ability to conduct opinion polls faster and with fewer personnel than in the past. One system uses a series of tape recorders and a single operator. The operator dials a telephone number. When the phone is answered, the tape recorder takes over and plays a recorded message to the party answering the phone. It then records the person's response. Meanwhile, the operator is busy dialing another number for one of the other tape recorders. This system permits a single operator to make as many as 1,000 calls per day. Of course, the results of such a poll are only as accurate as the information being asked. If the questions are poorly phrased or if there are errors in the sampling procedure, then it is difficult for the poll to reflect an accurate representation of the population.

There is another electronic device called an oculometer. This tracks eye movements and has been used to examine how people "watch" television commercials. A special sensor monitors the eye movements of respondents and has shown, for example, that people are attracted immediately to people in television commercials, that attention spans are rather short, and that certain visual elements in a television commercial can actually interfere with the commercial message by distracting the viewer away from the product being advertised.

In special research centers, colleges and universities, advertising research firms, and almost anywhere there is broadcast-related research, the paper and pencil questionnaires often are being replaced by still more electronic data-gathering instruments.

Electronic Response Systems

Electronic data gathering, in which a member of an audience punches a button or has his or her pulse read electronically, is not new to broadcasting.[11] In 1937, Dr. Frank Stanton of CBS and Dr. Paul Lazarsfeld, a well known social scientist, developed "Big Annie." It was perhaps the first electronic response indicator (ERI) used to measure how an audience reacted to radio shows. The listener could push one of three buttons labeled "like," "dislike," and "neutral."

Big Annie had a short life, but she did spark interest in electronic data gathering. One instrument designed to do this was invented by a professor of telecommunication at the University of Oregon, Dr. Elwood Kretsinger. He called it a "Chi Square Meter." It simultaneously records an individual's responses to whatever he or she happens to be listening to or watching. Comparisons of responses among different individuals or groups are made using a statistical test called the chi square, thus the name Chi Square Meter. The Chi Square Meter was not Kretsinger's first venture into response systems. In the late 1940s, he invented a device called the "wiggle meter" which measured how much people fidget. The device had three components. A wire was strung on the back of a chair, which was fed into an amplifier, which in turn measured the amount of "wiggling" on a long roll of graph paper.[12]

The increased interest in ERIs has resulted in a number of commercial firms manufacturing the systems. Usually installed in a large auditorium, an ERI is attached to every seat or desk. At each desk the unit has five buttons that can electronically record anything from an answer to a five-part, multiple-choice question, to expressing one of five attitude responses such as "strongly agree," "agree," "neutral," "disagree," and "strongly disagree." The entire auditorium of ERIs can be monitored by a computer and can register continuously the response of the entire room, sections of the room, or calculate statistical comparisons between various groups of people.

Assume you have produced an instructional television program and now want to test its effectiveness. You arrange for a physical education class to use a room equipped with ERIs and, at periodic intervals in the program, ask the class to respond to a series of questions prepared to evaluate your program's effectiveness. When the program is over, a computer printout tells you how the class scored on every question. Those questions the students missed may indicate that you need to revise one or more sections of the program. If you had not been using ERIs, you could have waited until the program was over and given the students a paper-pencil test to evaluate what they had learned. However, you then would have had to score the tests and calculate the statistical computations yourself or wait until they could be done by computer.

Galvanic Skin Response

Not all of the methods to test audience reaction necessitate pushing a button or wiggling. There also are systems which measure the changes in the conductivity of the skin, called galvanic skin response (GSR). One firm uses electrodes attached to the palm of a hand to test audience reaction to such things as commercials, records, and radio station formats.[13] About 100 persons are selected for each study, and the system's developers have claimed that it has as high as 91 percent accuracy in predicting whether records will appear in the top 20 of the national charts. Another system uses a computer and analyzes the data from about 80 subjects, also wired for GSR readings. The developers claim that the device is successful in figuring out how to "recycle" listeners, making them return to listening to a radio station once they have sampled it.[14] Still other systems have used brain waves to measure audience response. Researchers at the Princeton Medical Center, using an electroencephalograph, examined the brain waves of people watching television.[15]

Gathering data from either ERIs or GSRs has two advantages over older methods of data collection. First, it is fast, especially when monitored by a computer. What formerly took hours of work and computation can now be calculated almost instantaneously. Second, it can measure detailed aspects of audience reaction, thus providing much more sophisticated data bases. When decision makers can monitor audience reaction every few seconds, they have a more useful account of how an audience is reacting to a message.

Such systems can be installed even in mobile vans which can stop outside a grocery store and ask shoppers to come in. Inside, customers watch a television commercial and have their reactions to the commercial tested. Then the operators watch the shoppers enter the grocery store and directly monitor sales of the product.

Disadvantages of the systems are in the limited number of responses that can be monitored at any one time. Although a major rating service can obtain feedback from an audience large enough to predict national trends, most electronic response systems are designed for a group no larger than can be accommodated in a small auditorium. This limitation is not, however, a technological weakness. Electronic response systems that connect the home to a computer, much in the same way as a two-way cable system does, already enable measurement of large audiences.

The future may see national populations watch television with their reactions to the program being monitored on a second-to-second basis. It is not beyond the reach of current technology.

Role Observation: Producing an Ethnography

Although such measures as ERI and GSR are useful for highly controlled laboratory conditions, the very artificiality of those conditions can sometimes limit the applicability of research results. Recently, researchers have been turning to less "laboratory-oriented" methods of data collection and instead to more real-life settings. Actually living with families and observing how they use radio and television is becoming a more frequently used research approach. The results of such approaches can produce an ethnography, an accounting of how individuals have interacted with their environment, with each other, and in the case of broadcasting, the role radio and television have played in this scenario.

Research is telling us of the increased importance media play in structuring our daily activities and interpersonal exchanges.[16] Further ethnographic approaches to the study of radio and television in our lives will provide new perspectives on how we relate and interact with our media-filled society.

summary

This chapter has examined the broadcasting research process. There are four kinds of research: historical, descriptive, experimental, and developmental. Of these, descriptive research is the one most often associated with research in the broadcasting industry. Experimental research manipulates an independent variable, then observes any phenomenon resulting from that manipulation. The phenomenon to be observed is the dependent variable. Research extends from that done at academic research centers to individual studies by students and faculty, to doctoral dissertations. Besides that done by the government and rating services, additional research is conducted by local stations and networks.

Survey research common in local stations includes community needs and ascertainment surveys, station image surveys, and sales and marketing surveys. Required by the FCC, community needs and ascertainment surveys include a demographic profile of the community, a community leader survey, a general public survey, and a survey of the "voiceless" community. The FCC suggests 19 different categories of community leaders and determines the approximate number of consultations by the size of the population. The general public survey should be a random sample of the total community serviced by the station. Station image surveys often use more sophisticated methodology than community needs and ascertainment surveys do. Ranking of programs, questions on station operating procedures, and semantic-differential scales are just some of the many methods used to discover an audience's perceptions of a station and its programming. Sales and marketing surveys determine if systematic broadcast advertising campaigns have had satisfactory results.

Public opinion polls are usually the domain of the broadcast journalist and are frequently used around election time. But merely conducting a good poll is not enough. Reporters should consider information about sample, sponsor, population, contact method, questions, sampling error, and headlines to communicate responsibly the results of a poll to a broadcast audience.

New technology is significantly altering the way in which research data are collected. Such methods as electronic response indicators and galvanic skin responses are being used more often to hasten the collection and processing of raw data. Role observation which produces an ethnography is also gaining increased attention.

spotlight on further learning

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19

the broadcast audience: approaches to studying effects

FOCUS After completing this chapter, we should be able to

Explain early approaches to understanding the mass audience.

Describe the Bullet Theory.

Define the *individual differences approach*, *categories approach*, and *social relations approach* to studying the effects of broadcast communication.

Define *opinion leaders* and the *two-step-flow*.

Understand the concepts of selective exposure, perception, and retention.

Define *demographics* and *psychographics*.

Explain what is meant by the functional uses of broadcasting.

Understand how broadcasting affects our socialization.

Discuss the issues and effects of televised violence.

Imagine that you are an advertising agency media director. Selecting a magazine in which to advertise your client's products requires you to examine the magazine's audience. You naturally need to know the circulation, but you also want to know something about how the readers think, what their interests are, how old they are, what their income is, and how much education they have had. If the magazine is well established, this information will be readily available to you in a readership survey.

Now assume that you need to buy time on a major television network. Here, identifying the audience becomes much more difficult. Although you could choose certain types of programming to reach certain audiences, such as Saturday morning programs to reach children, you are dealing mainly with a large, unidentified audience.

To say only that a broadcast audience is too big and complex to study would be to admit defeat much too soon. Instead, this chapter will examine what we *do* know about the broadcast audience, realizing all the time that researchers are continually working to learn more about it. We have been able only to scratch the surface of this inquiry, partly because human behavior is a highly complex phenomenon. Our studies of television violence and the effects of broadcast programming overlap with research in many other disciplines. Moreover, cooperative research across international boundaries is still another possibility which can be invaluable if political conditions permit.

understanding the audience

In chapter 1 we discussed broadcasting as mass communication. Now we shall discuss the broadcast audience as a mass audience.

Early Perceptions of the Audience: The Bullet Theory

How researchers view the mass audience has changed dramatically in the last fifty years. Theorists used to look at it as a disconnected mass of individuals who received communication in much the same way that sitting ducks receive buckshot. This approach to media effects was labeled the *bullet theory*, sometimes called the hypodermic theory. Part of the misconception developed during World War I with the scare tactics of the propaganda campaigns. As researchers began to realize that human behavior was more complex than that of sitting ducks, the idea of the mass audience began to change.

The first change was in the concept of mass. Instead of being viewed as a huge body of isolated people with similar reactions to media messages, the audience gradually was studied as a group of individuals held together by different social systems and reacting to messages based partly on other people within these social systems. The political commercial may affect different people in different ways. Those same people may interact with and talk to other people about the commercial. These other people may determine, just as much and many times more so than the media does, how the person reacts to the commercial.

Individual Differences, Categories, and Social Relations Approaches

In revising the bullet theory, three approaches to studying audience reaction were used. One was the *individual differences approach*, proposing that each of us has individual qualities which result in our reacting differently to media messages. Professors Melvin De Fleur and Sandara Ball-Rokeach in their book, *Theories of Mass Communication*, describe the individual differences approach: "Individual differences perspective implies that media messages contain particular stimulus attributes that have differential interaction with personality characteristics of audience members. Since there are individual differences in personality characteristics among such members, it is natural to assume that there will be variations in effect which correspond to these individual differences."[1] Variables in these differing effects are partially caused by the audience's exposure, perception, and *retention* of media content which we shall examine later in this chapter.

Another approach to the mass audience and the effects of media content is *the category approach*. Its origin was in the needs of advertisers to reach more specialized audiences. Although the simplest way to group an audience into categories is by demographics—sex, age, etc.—researchers are looking more and more at psychographics—values, beliefs, attitudes, and lifestyles. Looking at the audience using categories can be much more complex than the old bullet theory. Notice that we said *can be*. For the ad buyer wanting to reach 18- to 21-year-old females, the application of the theory becomes mechanical. But for social scientists wanting to know how categories of people think and how they interact with other categories of people, the approach becomes much more complex. Moreover, if we want to use these interrelationships to understand how people react to broadcast messages, the process becomes even more sophisticated. Buying an ad to reach the homemaker is one thing, but buying an ad to reach the homemaker who interacts with another homemaker viewing a competing commercial is something else.[2]

Concentrating on this interaction and the people taking part in it would describe the *social relationships approach* to studying the audience and the media effects on it. Interpersonal communication is important to the social relationship approach, as is the realization that although the media can help disseminate the initial message, how it is retransmitted, discussed, and rediscussed among audience members, will in great part determine the effect of the message.

After considering the different approaches to studying the audience and the effects of broadcast communication on an audience, we readily can see that not only do the three approaches overlap, but that in some ways, all are part of the communicative process. It is much like viewing that process through different colored glasses. A psychologist concerned with an individual's behavior might feel more comfortable with an individual differences approach, although that same psychologist would be foolish to ignore the other approaches. Similarly, an advertiser wanting to reach a specific type of audience might be concerned with categories but cannot ignore the interrelationships among people that demand the attention of the social relations approach.

flow and processing of broadcast messages

Interaction among members of the broadcast audience is part of the natural process of information dissemination and processing.

Opinion Leaders and the Two-Step Flow

Imagine for a moment that you are discussing a new television series with your friend. Your friend tells you how great the series is, that you would enjoy the fast action, and suggests that you watch it. Since you value your friend's opinion, you decide you will take a break from studying to watch the show. Why did you make that decision? Because you undoubtedly valued your friend's opinion enough to be influenced to take action—to watch the program. In doing so, you demonstrated how other people, people we shall call *opinion leaders*, influence opinions of media content.[3]

Since you had not seen the program, your friend's description was all you knew about it. By first hearing about the program from your friend, you demonstrated how messages flow to and through the mass audience. We call this process the *two-step flow*, even though many more than two steps may be taken before the information reaches all the people who eventually learn about it. You should also remember that the two-step flow can apply to both acquiring information and being persuaded by it.

Selective Exposure, Perception, and Retention

In discussing the individual differences approach, we talked about exposure, perception, and retention. Each influences our interaction with the media and how it affects us. For instance, research has taught us that we selectively expose ourselves to certain types of programming, the process being called *selective exposure.* If a politician is delivering a televised address, you might tune in the program because you agree with the politician's views. On the other hand, you might tune in the program because you disagree with the politican. For either reason, you selectively exposed yourself to the program.

Second, the perceptions you hold before watching the televised address will also affect how you react to it. If you are extremely loyal to the politician, you might agree with everything she says regardless of *what* she says, so much so that if her opponent said the very same thing, you might totally disagree with him. You would be guilty of *selective perception.* It is not a serious crime, but one which can distort how you react to messages.

Third, because of your selective perception, you may retain only those portions of the address with which you agree. If you perceive the entire address as favorable, you may remember all of it. If you perceive it as unfavorable, you may wipe it entirely from your mind. If parts of the address affect you positively, you remember those parts while forgetting the negative ones. Or the negative ones may be the very ones you remember. Either way, how you originally perceived the address determines what you retain, a process called *selective retention.*

An interesting study examining selective perception among viewers of the television program "All in the Family" showed that selective perception caused differing opinions of two of the show's main characters—Archie Bunker, a very conservative factory worker, and his son-in-law Mike, a liberal college student. Professors Neil Vidmar and Milton Rokeach found that highly prejudiced people identified more with Archie and perceived him as making better sense than Mike. They also perceived Archie as winning between the two more often. Highly prejudiced persons indicated that they disliked Mike's personality much more than they disliked Archie's. Vidmar and Rokeach found that "persons who like Archie reported he is down-to-earth, honest, hard-working, predictable, and kind enough to allow his son-in-law and daughter to live with him." Conversely, less prejudiced persons disliked Archie's personality traits more than they disliked Mike's. People who liked Mike felt that he was tolerant and stood up for his beliefs. Those disliking him saw him as stupid, narrow-minded, prejudiced against the older generation, rebellious, lazy and a "banner waver."[4]

Source Credibility and Media Credibility

Two other factors which can affect how we perceive broadcast messages are source credibility and media credibility. Source credibility is the credibility of the original source of the communication. In the case of the politician's televised address, source credibility would be the credibility of the politician. If you perceive the politican as highly credible, then the chances are that your reaction to her would be favorable. Research has assigned many subordinate factors to source credibility, among them, dynamism, trustworthiness, and competence.

We know that source credibility lies partially in the source and partially in how the source is perceived by the audience. In other words, how broadcast messages affect us is related to how we perceive the source of those messages. Source credibility and both interpersonal communication and mass communication all are part of the communication process.

Media credibility refers to how you perceive the overall credibility of a medium, such as a local radio station. Media credibility can also determine the effect of a broadcast message. Two types of media credibility are important, intermedia credibility and intramedia credibility. Intermedia credibility is the relative credibility of various media, such as determining that television is a more credible medium than radio or newspapers. Intramedia credibility is the relative credibility within the same medium, such as the credibility between two radio stations. Over a number of years, studies on media credibility have asked such questions as, "In the face of conflicting news reports, which medium would you be most likely to believe: television, newspapers, radio, magazines, or other people?" Much of the research has found television to be the most frequent response. Notice that we said "most frequent response," not necessarily the "most credible medium." Such studies fail to allow for the many possible intervening variables which truly reflect the characteristics of media credibility.

Based on such research, we might justifiably ask whether, if television is listed first, it is because it is the most credible or because we spend more time with it than with other media? Is there a wide variance among different media in different communities? In some communities, would radio or newspapers come out on top because of the credibility of the local press? How many times do we really hear or even recognize conflicting news reports? Is television really the most credible medium or do we just think so because two of our senses, sight and hearing, can consume the information instead of one and do so in color and in motion?

Some research which had listed television as most credible, listed radio as least credible. If we were to interpret those results literally, we might have some difficulty explaining some recent effects of radio programming. Back in 1938, Orson Welles, acting in the radio play of H. G. Wells's "War of the Worlds," made many people hysterical because they believed there was an actual invasion from outer space. Those who said it could not happen again were proved wrong in 1977 when Swiss radio aired a program with mock news bulletins about neutron bombs being dropped in a war between East and West Germany. Mock casualty reports listed 480,000 people killed. Panicked listeners called the station and received an official apology over Swiss radio.

The broadcast media do not seem so credible when it comes to advertising. Asking a question similar to the one about news credibility, research has shown newspapers as a more credible advertising source than other media. A survey asked, "Some advertising seems honest and believable, while other advertising seems hard to believe. In this area, considering radio, newspapers, television, and magazines—which one is likely to carry the most believable advertising?" Newspapers were listed first by the different categories of respondents.[5]

Further research on media and source credibility can be invaluable to both the business and consumer communities. Our access to the media, its availability, our interests in specific programming, our attitudes, and the video or audio techniques used to communicate broadcast programming are all part of our perceptions.

categorizing the broadcast audience

We already have talked about some of the approaches used to examine the audience—individual differences, categories, and social relations. All of these approaches will eventually concentrate on two broad categories of audience classification: demographics and psychographics.

Demographics

Demographics refer to such things ~~as the age, sex, education, income, and~~ race of an audience. Partly because the data are easily obtainable, from everything from courthouse records to census figures, demographic characteristics of an audience are the most commonly used types of broadcast audience classification. The rating services, for example, use age and sex as their two principal categories, such as women eighteen to twenty-four years of age and men thirty-four to forty-nine years of age.

Arbitron Television developed special questionnaires approved by its legal counsel which provide demographic breakdowns of ethnic audiences. The questionnaire asked families "how you describe your family." It was then validated through personal interviews with respondents who had indicated their race/nationality characteristics on the Arbitron diary.

For advertisers, the demographic audience becomes something to reach, something to identify and something to persuade. Using data from rating services and broadcasting stations, advertisers make time buys based on such things as when the highest concentration of women is watching and what the cost-per-thousand (CPM) is for those women reached. Others need data to reach children, males, minorities, or teenagers. The key is to match the product to the audience, and the more specialized the product becomes, the greater the need is to reach a specialized audience.

Demographics will most likely continue to be the main identifier of broadcast audiences for four reasons. First, the information is easily obtained from different sources. Second, the industry is geared to using demographic data and feels comfortable with them. Although psychographics is becoming more important, the average radio station manager is much more at ease with data on age, sex, and income than with psychological constructs, media involvement scales, or value profiles. Third, advertisers are comfortable with demographic data. An account executive selling a local druggist a radio commercial is much better talking about the station's high income audience than attempting to teach a course in psychology while explaining the station's rate card. Fourth, information other than demographics is still subject to conflicting methodologies, not so much in the minds of the researchers collecting the data as in the minds of the industry that uses them. Although one research firm which might claim to analyze an audience's value structure while another which analyzes its personality may be correlated, the broadcast manager may simply groan and say, "Just tell me if it's a man or a woman and how much money they make."

Psychographics

Psychographics refers to such things as attitudes, values, beliefs, or opinions. Psychographics methodologies range from dividing an audience into attitudes about brand preferences to discovering that audience's subconscious reactions when interacting with broadcast programming. Asking consumers if they prefer brand *X* or brand *Y* is one form of psychographic information. Interviewing prison inmates to determine how they react to television crime shows entails a far more complex psychographic profile.

One example of widely used psychographic information is applied to television programming in adjacent time blocks. It is based on the theory of *cluster programming.* Using the work of clinical psychologists, a group of researchers at Ohio State University classified different types of audiences,[6] such as people who like situation comedies or people who like Westerns. The idea of program preferences among these "types" was then carried one step further by a member of the same research team that worked on the original study, Dr. Joseph Plummer, research executive with Leo Burnett, U.S.A. Plummer subjected data on viewing habits to statistical measures which showed different programs tended to "cluster" together. For example, if you like "Baretta," you probably will like the other police-action shows, "Starsky and Hutch" or "Kojak." If you like situation comedies, then "Three's Company," "Mork and Mindy," and "Angie" could be your favorites. "Sha, Na, Na," "Happy Days," and "Laverne and Shirley" are three similar programs. Basing decisions on both program preferences and how different programs cluster together, networks now find it profitable to schedule similar types of programs in blocks.

functional uses of broadcasting

By applying psychographics, we can study the functional uses of broadcasting. The term functional uses asks "What function does broadcasting play in our lives?" Examples of these uses are, "I use broadcasting to learn what's happening in the world," "I use broadcasting to be entertained," or "I use broadcasting to escape from reality." The three functions just mentioned are information, entertainment, and escape.

Stephenson's Play Theory

Using a data gathering procedure called Q-sort, William Stephenson completed extensive research on how different types of audiences, expressed as typical individuals, feel about the media. From this research has come Stephenson's Play Theory which, applied to broadcasting, suggests that we use radio and television as a means of escaping into a world of "play" not accessible at other times.[7] Those researchers familiar with Q methodology have supported Stephenson's theory as well as his methodologies. Others have been severely critical, like Professor David Chaney who contends that "Stephenson . . . fails to move beyond an individualistic level of description. While the importance of audience commitment is understood, his concern with finding a methodological demonstration of his argument leads his audience to be conceived as only a conglomeration of individuals."[8]

Professor Deanna Robinson offers a more generous view of Stephenson's methodologies. For conducting research on the uses of television and film by upper-middle class professionals, she suggests that Stephenson's technique could be used to directly examine people's attitudes toward the media and be able to demonstrate "(1) that within any single, demographically defined audience group several attitude or 'taste' groups exist and (2) that similar taste groups exist within other classes."[9] Schramm also supported Stephenson and generalized that Stephenson, with a style of writing like Marshall McLuhan's, could have been the guru of modern media.[10]

Uses and Gratifications

Stephenson's Play Theory is part of a wider body of research and theory centering on what uses we make of media and what gratification we get from exposing ourselves to them. Research has examined these uses and gratifications in populations ranging from farmers in less developed countries to American homemakers. The research has not escaped vigorous debate, however, not only on the different types of uses and gratifications, but on the very methodologies which attempt to identify them.

Part of the debate is a conflict between the individual differences approach and the social categories approach to the study of media effects. Consider a television program. We could argue that a soap opera provides certain role models for homemakers or college students. We also could contend that reaction to soap operas cannot be classified in demographic terms, but rather in psychographic terms. Soap operas have certain *uses* for people with specific motivations or certain psychological characteristics. We could argue that even this approach is unsatisfactory since each individual is different, and many different individuals may have many different uses for the same soap opera. How we learn what uses these many different people or groups of people make of the media is still another dilemma. Do we test them individually in tightly controlled laboratories, psychologically wiring them to get at the depths of their thought processes? Or do we sample a large population of respondents in a survey? We shall examine the conflict of which research design to use later.

What has the research told us about uses and gratifications? By sampling a few of these studies, Robinson examined upper-middle class professionals. She discovered the presence of "information absorbers," people who passively absorb information from television without actively interpreting it. Another group she labeled "analytical artists," who used television to increase their understanding of themselves, other people, and the world.[11] Researcher Neil T. Weintraub suggested that radio makes teenagers feel more aware, that it makes their day pass more quickly and that it also lets them know what is happening.[12] Researcher

Lawrence Wenner examined the elderly and found that one use of television among this group was companionship.[13]

One of the earliest studies on the uses of the broadcast media was conducted by Herta Herzog who examined the use of radio soap operas for listeners. Conducting in-depth interviews, Herzog found three uses: compensation, wish fulfillment, and advice. In the compensation category were people who wanted their own behavior compensated by identifying with a soap opera character. Others listened because they were living vicariously, having achieved in the soap opera what was missing in their own lives. The third group sought advice on how to conduct their own lives.[14] More recently, Professor Joseph Foley examined a viewing audience and found eight functions of television viewing to be: withdrawal, play, conversation, togetherness, para-social interaction, educational, background (the set on but not being watched), and normative function (learning about social norms).[15]

The list of studies and their audiences continues. No matter what methodology the studies use or theory they devise, they all add continuing fuel to the debate over what use we gain from broadcasting and how it should be studied[16]

The Agenda-Setting Function

Of all the recent research on the functional uses of media, some of the best and most systematic is on the *agenda-setting function.* Agenda setting argues that the media not only inform us but inform us about what we should be informed. In other words, media set an agenda for our thought processes; they tell us what is important and what we should know and need.

Sophisticated analyses have now made it possible to isolate those media which are dominant in the agenda-setting function, no small task since many communities have more than fifty different media. Newspapers, radio, television, books, and magazines all are important. By keeping track of which media are important to specific populations and then concentrating on those media, a theoretical base for agenda-setting can be built.

The agenda-setting function becomes more pertinent when we consider that media suddenly have become some of the main determinants of how we perceive our world. The media, in effect, actually structure our world, and we, in turn, reinforce this structure. Bernard Cohen summarized the agenda-setting concept when he said that the mass media may not be successful much of the time in telling people what to think, but the media are stunningly successful in telling their audiences what to think about.[17]

This agenda-setting function can also be divided into the *interpersonal* *agenda*, the things we not only think about but talk about, and an *intrapersonal agenda*, the things we merely think about.

The first empirical test of the agenda-setting function was in 1968 when researchers Maxwell McCombs and Donald Shaw examined the presidential elections.[18] Since then, McCombs and others have continued research on agenda-setting.

Still other research winds its way into media decision making, specifically, the study of how and why gatekeepers select the news they do and feed this to the public. The gatekeeper agenda appears to originate in the wire services. Thus, although the local press sets the public's agenda, the wire services set the agenda for the gatekeeper. Although researchers continue to search for remnants of media theory, agenda-setting research appears to have one of the firmest holds on an identifiable and consistently proveable phenomenon.

socialization

Closely aligned to how we use broadcasting is its effect on our social development in acquiring culture and social norms. Although a significant amount of research centers on broadcasting's effects on the socialization of children, we all know that socialization continues throughout our lives, and broadcasting can affect this socialization at any time. Again, as with other approaches to studying effects, the content of broadcast messages can mean different things to different people. For example, the effect of a violent television program on a group of male adults can be in sharp contrast to the effect of that same program on a group of small children, whose world and ideas are just being formed and whose socialization process is much less developed than that of the adults. The adult might go to bed thinking how great John Wayne was as the hero. The child may have frightening nightmares about evil forces affecting his or her ability to survive in the world.

Here again, research has opened up a Pandora's Box of results, theory, and debate, and different methodologies are used. As a responsible consumer of broadcasting in society we should recognize them. Since socialization does not occur simply by watching a single program, we must gather data from a wide body of research across many disciplines with which to begin to theorize exactly how media in general and broadcasting in particular affect our socialization process. Moreover that data must be gathered over time. Few studies examine socialization over time. Most ask a given group of individuals what meaning television or radio has for them and then group the results under the heading of socialization of uses and gratification research. Although examining a great deal of research about these different audiences is valuable, studying the same individuals over a longer time period is much more desirable.

Stages in Studying Effects on Socialization

Socialization research has three stages. First, numerous studies have examined the "content" of broadcast messages. Such elements as the image of women in television commercials, hero figures in prime-time television, and acts of violence have told us much about what we see or hear on radio and television. The second stage of this research tells us if people exposed to the broadcast message actually perceive or recognize the messages which are conveyed. Were children who saw a given program able to recognize examples of good behavior and pro-social messages? The third stage of investigation must determine what effect the messages have once they are received.

Studying the Results

From socialization research, we have learned that children can indentify certain pro-social content themes. For example, CBS has actively supported various research projects on ths issue, which have been beneficial to public relations. The research has been conducted under responsible surveillance.[19] In examining the program "Fat Albert and the Cosby Kids," research in three cities—Cleveland, Philadelphia, and Memphis—revealed that close to nine out of ten children who had seen an episode of "Fat Albert" received one or more messages of social value. Some of the pro-social messages reported being received included, "Take care of younger children," "Father's job is important," "Support a friend in trouble," "Be honest," and "Be friendly; don't be rude, nasty, jealous, or mean."

Similar research by CBS showed older children were more likely to receive more abstract messages than younger children were. For example, in studying the program "Shazam" about a Superman figure, about half of the seven to eight year-olds received the message "obey your parents," whereas about three-fourths of the ten to eleven year-olds and the thirteen to fourteen year-olds received that message. Only 4 percent of the seven to eight year-olds received the message to "be independent," whereas 11 percent of the ten to eleven year-olds and 25 percent of the thirteen to fourteen year-olds received the message. In examining the program "Isis," about a superhuman female figure, the research discovered that girls were more likely than boys to comment on Isis's concern for others and her beauty, while boys mentioned her superhuman qualities as often as girls did.

After analyzing the effects of broadcasting socialization, we can conclude that parents have a major responsibility in not permitting television to become a surrogate parent.[20] Watching television with very young children, then discussing the results and referring to possible pro-social lessons is one positive use of the medium. This same process was common in pretelevision times when parents read storybooks to children, then discussed the content of the books. Children apparently learn from television, and such broadcasting practices as stereotyping the roles of certain classes of people can form a child's perception of reality.

The amount of television and when and how it becomes part of children's lives also can influence how children relate to their environment. In studying three towns in Australia which had three different types of television programs available, researchers found that the content viewed was directly related to the context in which it was viewed.[21] When television experience was restricted to mostly an informative-educational context, children perceived it to be far more than just entertainment. When high levels of television viewing tended initially to reduce participation in such outside activities as sports, participation returned to normal levels after the "novelty" wore off.

Content and context variables also are included in research on the political socialization of children. Political knowledge, news discussion, public affairs interest, and seeking information about news events were investigated by Professors Charles K. Atkin and Walter Gantz.[22] They found the amount of news viewing to be somewhat associated with a child's political awareness, with the highest correlations being among older children. The amount of exposure to television news has some relationship to the child's knowledge of politics, but it has more among middle-class youngsters than among working-class youngsters. Many children in the research reported being stimulated to seek further information after watching television news, and to some degree this desire for more information increased with the amount of news exposure.

Advertising also can influence the socialization process. For example, one study showed children three different eyeglass commercials with a woman giving a testimonial.[23] One commercial showed her dressed as a court judge, another as a computer programmer, and the third as a television technician. The children who saw that woman as a particular role model were more apt to choose that occupation as appropriate for women.

There is still much to be learned about the effects of broadcast messages on the socialization process. In dealing with children, part of our knowledge will be gained from examining what psychologists long have taught about learning theory and formative development.

the violence debate

Of all broadcasting's effects, none has attracted more attention than the portrayal of violence on television. It has been grounds for research and debate for academicians, government agencies, local schools, and international research organizations alike.

Violence Gains Attention

The current attention to televised violence has been attracted not only by its very presence, but also by research indicating a possible causal relationship between violence and behavior. Two published articles appearing in the *Journal of Abnormal and Social Psychology* in 1968 set the stage. The two articles examined exposure to filmed violence and subsequent aggressive behavior.[24] Other studies followed. Yet the issue had been raised before, back in 1952 by Senator Estes Kefauver's committee on juvenile delinquency. But in 1952, television was too new to draw pertinent conclusions, despite testimony by recognized authorities and psychiatrists.

The issue remained mostly academic until 1969 when a letter from Senator John O. Pastore called for a blue-ribbon committee of leading scholars to examine the relationship in detail. In a letter to the secretary of health, education, and welfare, Pastore said, "I am exceedingly troubled by the lack of any definitive information which would help to resolve the question of whether there is a causal connection between televised crime and violence and antisocial behavior by individuals, especially children . . . ." Pastore then called for the formation of what became known as the Surgeon General's Scientific Advisory Committee on Television and Social Behavior. The list of experts selected to serve on the committee was chosen by reviewing names of experts on the subject. The final selection process was assigned to the three commercial networks and the NAB. CBS, seeing its own research director as a possible appointee, withdrew from the selection committee to avoid conflict of interest. Completed in 1972, the committee's report immediately drew praise, criticism, and varying interpretations. What did stand out as the most succinct summary statement of the committee report was:

> *There is a convergence of the fairly substantial experimental evidence for short-run causation of aggression among some children by viewing violence on the screen and the much less certain evidence from field studies that extensive violence viewing precedes some long-run manifestations of aggressive behavior. This convergence of the two types of evidence constitutes some preliminary evidence of a causal relationship.*

In other words, the report found the possibility that television violence could adversely affect some people. The report aroused widespread attention to the violence issue and encouraged new research to discover the heart of the "causal effect." Today, the research has not yet been finished, with various foundations and government agencies continuing to fund studies.

The networks have also become involved in violence studies. Undoubtedly because of the pressure to revamp American television, the networks and, for that matter, their affiliate stations are under fire. In some cases, the affiliates are even worse offenders than the networks, preempting bland network fare to insert more violent programming.

Theories of the Effects of Televised Violence

The relationship between televised violence and aggressive behavior is best understood using the various learning theories. There are four main theories. The *catharsis* theory suggests that we build up frustrations in our daily lives which are released vicariously by watching violent behavior. The catharsis theory claims that therefore there are actual benefits from televised violence. This theory is the least supported of the four, although the results of some studies have provided limited support for the idea.[25] The *aggressive cues theory* suggests that exposure to violence on television will raise the level of excitement in the viewer, and that televised violent acts may possibly be repeated in a real-life setting.[26] Closely aligned to the aggressive cues theory is the *reinforcement theory*, suggesting that televised violence will reinforce behavior already existing in an individual.[27] Inherent in such a theory is the probability that the violent person, because of violent tendencies, perceives violent behavior as a real-life experience, whereas the nonviolent person may perceive the violent program as entertainment without becoming "psychologically" involved in the program. The *observational learning theory* suggests that we can learn violent behavior from watching violent programs.[28]

Clearly, all of the theories have merits, and none should be discounted. Research is examining new variations on these four principal approaches. The observational learning theory, for example, could apply more to very young children in their formative years of growth, when their environment has a significant effect on what they learn. In essence, if television becomes a surrogate parent, it could certainly teach behavior. Later in the child's life when behavior is more firmly determined, violence learned in the formative years could be "reinforced." For the hyperactive or easily excitable child, the aggressive cues theory might be used to explain easily aroused emotions from exposure to televised violence. The catharsis theory even could apply to the business executive who uses television to unwind and vicariously vent his or her frustrations through the actions of others. We immediately begin to see all sides of the violence debate.

Current research is centering primarily on children, partly because of funding for such research and partly because of a general feeling that children may very well be those most affected by television violence. In this arena, the violence debate is becoming public with considerable pressure from and visibility of citizens' groups. Along with suggesting the causal relationship of televised violence to aggression, the widely quoted research of George Gerbner, Director of the Annenberg School of Communication at the University of Pennsylvania, is used to add fuel to the arguments.

For more than a decade, Gerbner and his associates have compared violence on television among the major networks, then have plotted their data over time, providing a running record of the number of violent acts representative of each new television season. Two often discussed measures are Gerbner's Violence Index, measuring the actual acts of violence, and the Risk Ratio, describing the risk of encountering violence. The index is used mostly to count violent acts on television; the ratio is a bit more complex. It measures the aggressors and the victims, dividing the larger by the smaller with the final figure preceded by a plus sign if the number of aggressors exceeds that of the victims and a minus sign if the number of victims exceeds that of the aggressors. CBS uses a different violence-measuring device, prompting the continuing debate over which measure is more accurate and more representative of actual violence.[29]

Effects of Portrayal on Aggressive Behavior

The amount of research on televised violence is now tremendous, with more studies in progress. What the research is telling us about the relationship between the portrayal of violence and aggressive behavior is summarized by Professor George Comstock in the *Journal of Communication.* He states that the evidence suggests:

1. Cartoon as well as live portrayals of violence can lead to aggressive performance on the part of the viewer.
2. Repeated exposure to cartoon and live portrayals of violence does not eliminate the possibility that new exposure will increase the likelihood of aggressive performance.
3. Aggressive performance is not dependent on a typical frustration, although frustration facilitates aggressive performance.
4. Although the "effect" in some experiments may be aggressive but not antisocial play, implications in regard to the contribution of television violence to antisocial aggression remain.

5. In ordinary language, the factors in a portrayal which increase the likelihood of aggressive performance are: the suggestion that aggression is justified, socially acceptable, motivated by malice, or pays off; a realistic depiction; highly exciting material; the presentation of conditions similar to those experienced by the young viewer, including a perpetrator similar to the viewer and circumstances like those of his environment, such as a target, implements, or other cues resembling those of the real-life milieu.
6. Although there is no evidence that prior repeated exposure to violent portrayals totally immunizes the young viewer against any influence on aggressive performance, exposure to television portrayals may desensitize young persons to responding to violence in their environment.[30]

Policy Dilemmas

Where all this leads is difficult to predict, but even if the evidence becomes conclusive, the end result may be a constitutional crisis of sizeable proportions. Although government has traditionally kept an open ear to complaints about violence, sympathy and rhetoric has been about as much as Congress or the FCC has been willing to offer. To offer more would collide head on with the First Amendment to the Constitution and with the Communications Act of 1934. Even if the broad "public interest" standard were applied to try to curtail violence, court tests would be necessary to keep it from encroaching on the Constitution. Although the debate and research will continue, the biggest battle of all may be fought in the political arena in which no medium yet has been successfully curtailed, except superficially. Nor have the courts been sympathetic to the violence issue. When a Florida teenager claimed that telvision violence caused him to commit murder, the jury did not accept the idea. Then there is the case of Japan, receiving more and more attention because of the high level of violence on Japanese television and the low crime rate. Some possible explanations are that students are too busy with school work to watch much television, Japan's strict gun laws, and citizens becoming involved in crime protection.[31] Another possible explanation is Japan's society, with its emphasis on collective (family, school, company) responsibility versus the U.S.'s emphasis on individual responsibility. Although the attacks on violence will continue, possible alternative causes to the ills of our society will also remain of keen interest to policy makers.

Some changes may come as advertisers begin to place economic pressure on the networks. But support among local advertisers is minimal, and stations wishing to preempt network programming to air locally originated programs with more violence are finding little to stop them. At least in the immediate future, if televised violence is a serious threat, the threat will be held at bay best by educating responsible consumers of broadcast communication, including parents, and hoping for restraint and responsible decisions on the part of the broadcast industry.

summary

Chapter 19 has examined the broadcast audience and approaches to studying it to identify the effects of broadcast programming. Early theories of the audience as a mass of unrelated individuals responding like sitting ducks to media messages has been greatly altered. Contemporary theorists view the audience as interacting with the media, permitting media to be an important part of their lives. Three approaches to studying the audience are individual differences, categories, and social relations. Information received from the media flows through the population in a multistep process called the two-step flow. Opinion leaders are at the heart of the two-step flow theory and are used to describe those individuals who influence other people's reactions to media content. How we react to media content can be determined by three factors: selective exposure, selective perception, and selective retention. The importance we place on a broadcast message can be based on source credibility, media credibility, or a combination of both.

Demographics and psychographics are used to classify the broadcast audience. Demographics refer to such factors as age, sex, income, occupation, and race. Psychographics refer to attitudes, beliefs, values, opinions, and the psychological characteristics of the audience. With these classifications in mind, three approaches to how we use media are Stephenson's Play Theory, uses and gratification, and agenda-setting. Radio and television also are important to the socialization process of acquiring culture and social norms. Finally, one of the most visible issues of the effects of broadcast programming is that of televised violence.

spotlight on further learning

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appendix
using the library to learn about broadcasting

Information about broadcasting can be found in many library sources. The following guide is an introduction to selected major sources. Whether you are writing a paper, preparing an oral report, or just interested in expanding your knowledge, this guide will be useful.

For broadcasting, as for most disciplines, the library can be used for particular purposes, with a definite search strategy in mind. You can begin to build your knowledge of broadcasting using the simpler library sources and then move on to the more complex ones.

a strategy

The first and most important step in research on a particular topic is to find general background information. You can use several methods, including your course lectures and general textbooks. Another method is to use the library. Reference materials, such as general encyclopedias, are valuable in this "first" step.

Second, using the information found in the background sources, you can widen the search to include journals and books. Often the background information will give you possible search terms which will be useful in finding relevant information in other sources. The various sources also may include bibliographies and footnotes which may be helpful.

Third, you can use more extensive sources such as abstracts, annual bibliographies, and literary reviews. Usually these sources cite more books, journal articles, and other sources than usually are included in any one library, but they cannot be overlooked if you hope to exhaust the available sources of information.

Finally, collections such as United States government documents and newspapers may be helpful.

This guide follows this general organizational pattern.

using the card catalogue

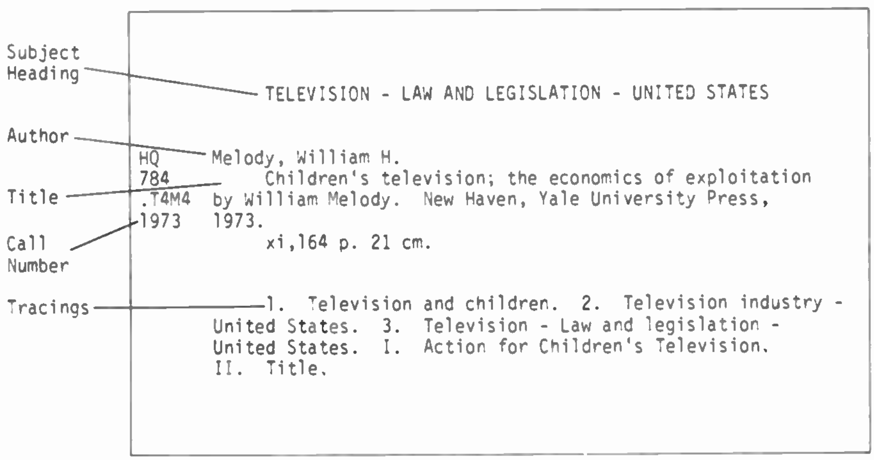
The card catalogue will probably be your first source of information. It can be used for finding suitable references to background information.

Using Subject Heading Cards

Subject heading cards are important to using the card catalogue efficiently. A newcomer to a discipline will use more subject heading cards than someone who has extensively studied a discipline and is familiar with specific authors and titles.

Try to think of terms which might be used as subject headings. Background information should give you some ideas.

A guide to finding subject headings in the card catalogue is the *Library of Congress Subject Headings*. This guide will refer you to the subject heading. For example, if you are looking for information on laws affecting television, you might find the following catalogue card:



This particular catalogue card is called a *subject card*, but the book could also be found by using an author or a title card. In addition, tracings indicate that this book could be found under the other subject headings, such as "Television and children" and "Television industry—United States."

The following list is of common subject headings used in the card catalogues.

Community Antenna Television	Television
Radio	Television—Apparatus and Supplies
Radio—U.S.—Laws and Regulations	Television—Law and Legislation—U.S.
Radio Advertising	Television—Production and Direction
Radio Announcing	Television and Children
Radio as a Profession	Television Announcing
Radio Audiences	Television Audiences
Radio Authorship	Television Authorship
Radio Broadcasting	Television in Education
Radio in Education	Television in Politics
Radio Journalism	Television Plays
Radio Plays	Television Programs
Telecommunications	

You usually will use the subject cards more than the author and title cards. However, all three are in most card catalogues.

Using Call Numbers

The call number of the book is in the upper left hand corner of the catalogue card. It refers to the location of the book, and it is assigned so that books on similar subjects are shelved together.

Call numbers may be used to peruse the shelves and find relevant books on a topic. This is not as efficient as using the card catalogue but still may be useful. Usually a particular subject heading card is not assigned to a book unless a significant portion of the book is on that topic. You may want to use subject headings to find several areas of the library to examine. While doing so, check the index in the back of each book for terms relating to the topic of research.

using references

References provide definitions of terms, biographical information, bibliographies, and introductory essays. Information from references can aid you in searching for information in more extensive library sources.

Biographical Sources

Most libraries have numerous sources of biographical information. Three major ones are:

Contemporary Authors
A multivolume work containing biographical information on living authors from every nation, giving personal data, avocations, writings, and works in progress.

Current Biography 1940—to date
A multivolume set of biographies of people in the news, both in the United States and abroad, often with photographs and obituaries.

Who's Who in America
The standard source of current biographies of noted men and women in the United States.

Dictionaries and Encyclopedias

Because many disciplines include topics relating to radio and television broadcasting, specialized dictionaries and encyclopedias, such as the *Encyclopedia of Psychology*, the *International Encyclopedia of the Social Sciences*, and the *Encyclopedia of Educational Research* also can be helpful.

Other References

Other references more directly related to the study of broadcasting are:

Broadcasting Yearbook
This work attempts to be "the most comprehensive directory of the business of broadcasting." Included are: a short history of broadcasting, a section on the dominant areas of influence of television stations, a directory of AM and FM radio stations, a directory of advertising agencies, and an equipment and engineering section.

BBC Handbook
This is not only an annual report of the financial position of the British Broadcasting Corporation but also a review of its programs and other operations.

Television Factbook
Included in this book are general data on the industry, directories of communications lawyers and engineers, manufacturers of TV and radio receivers and station equipment, trade organizations and publications, CATV systems, pay-TV organizations, and satellite data.

The Standard Directory of Advertising Agencies
Issued three times a year, this source lists some 4,000 advertising agencies, 30,000 personnel by title, and 60,000 accounts.

using indexes

Indexes are used to find relevant articles in magazines, journals, books, and newspapers. Some good ones to start with are:

Reader's Guide to Periodical Literature
A subject and author index to over 100 periodicals of popular interest.

Business Periodicals Index 1958—to date
An index to over 100 journals on various aspects of business.

Education Index
An index to over 200 periodicals relating to education.

Humanities Index
Formerly part of the *Social Sciences and Humanities Index*, an index to over 260 journals in the humanities.

Social Sciences Index
Formerly part of the *Social Sciences and Humanities Index*, an index to over 260 journals in the social sciences.

Social Sciences and Humanities Index 1965—1972
(formerly *International Index* 1920—1965)
An index of over 200 journals which in 1973 was divided into two indexing services: *Humanities Index* and *Social Sciences Index*.

Public Affairs Information Services (P.A.I.S.)
A subject index to "current books, pamphlets, periodical articles, government documents, and other materials in the field of economics and public affairs."

The New York Times
The index of *The New York Times*. Check your library for available indexes of other newspapers.

Topicator
An article guide to broadcasting, advertising, communication, and marketing.

International Index to MultiMedia Information
An index of material found in audio-video services.

Television Sponsors Directory
Cross-reference guide of addresses of companies producing goods advertised on television.

Also consult the indexes in most scholarly journals and magazines. Each is designed for quick reference to that particular publication.

using abstracting services

An abstract contains the information to find a particular journal article, just as an indexing service does, but it also summarizes the article. Usually the abstract is short—50 to 150 words. An abstracting service often indexes and abstracts many different sources.

The following are important abstracts pertaining to the study of broadcasting.

Communicontents
Abstracts of publications dealing with all aspects of communication, including broadcasting.

Dissertation Abstracts International
A monthly compilation of abstracts of doctoral dissertations submitted to University Microfilms International by more than 375 cooperating institutions in the United States and Canada. Abstracts of dissertations on broadcasting can be found in Volume A under the section "Mass Communications." A key word index, based on the dissertation's title, is at the end of each volume.

Mass Media Booknotes
Issued monthly, this publication provides descriptions and brief reviews of new books on all subjects related to the mass media.

Psychological Abstracts
An abstracting service for the world's literature in psychology and related fields.

Sociological Abstracts 1953—to date
An abstracting service for articles on sociology from many journals.

using government documents

Many libraries contain U.S. government publications. To get a head start in using government documents, check the following:

Indexes

Monthly Catalog of United States Government Publications
This is the standard guide to most U.S. government publications. Documents are arranged by issuing agency. See also the:

Cumulative Subject Index to the Monthly Catalog of the United States Government Publications

Selected Documents

The federal government publishes a variety of statistical reports, hearings, studies, and other documents relating to broadcasting. The following are major examples of various types of government documents.

United States Statutes at Large
As each law is enacted, it is published. Later, the laws passed during each session of Congress are included in the *Statutes at Large*. They are arranged chronologically by date of passage.

United States Code
This is the official compilation of U.S. laws in force. Laws from the *Statutes at Large* are consolidated and codified in this work. A completely revised edition is issued every six years with annual supplements between revisions.

Media Law Reporter
This contains the texts of major decisions affecting mass media.

Federal Register
Statutory laws prescribe general intent; Congress delegates to the executive and the various departments the detailed task of administration. Administrative rules and regulations have legal force. The *Federal Register* provides the medium through which new rules and regulations are disseminated.

Code of Federal Regulations
The regulations and rules in the *Federal Register* are codified annually and published in this source. It lists, among other things, all the permanent and general rules and regulations established by the Federal Communications Commission.

Federal Communications Commission Reports 1934–
This contains the administrative decisions of the Federal Communications Com-

mission, including decisions regarding "the Fairness Doctrine," television station license renewal, cable television, and many more.

Federal Communications Commission Annual Report 1935–
This is a review of the major events for the year in the area of regulatory concern, including administrative matters, engineering, legal and legislative activities.

Congressional Hearings, Monthly Catalog
The *Monthly Catalog* is the index to use when researching congressional hearings.

journals and trade publications

Numerous journals and trade publications relate directly or indirectly to broadcasting. Usually, the best method of finding information in the various journals is by using indexing and abstracting sources already described. Some journals periodically publish their own indexes.

Ulrich's International Periodicals Directory. This volume is arranged by subject and includes an alphabetical index by title of periodicals. Some of the more important periodicals relating to broadcasting are:

Advertising Age
Published weekly and contains news of the advertising business.

AV Communications Review
Contains articles on educational media, educational television, and other aspects of the teacher-learning process related to technology and communications.

Broadcast Daily
Published for delegates at major broadcasting conventions.

Broadcast Engineering
A technology publication of the broadcast/communications industry.

Broadcast Management/Engineering
Contains articles of interest to broadcast management and engineering personnel.

Broadcasting
Weekly business news of the television and radio profession. Reports of interest to advertisers as well as to programmers, journalists, engineers, and others. Includes reports on the Federal Communication Commission's decisions, hearings, and procedures.

Broadcasting and the Law (Perry's)
A biweekly newsletter which reports and interprets current court and FCC rulings affecting broadcasting.

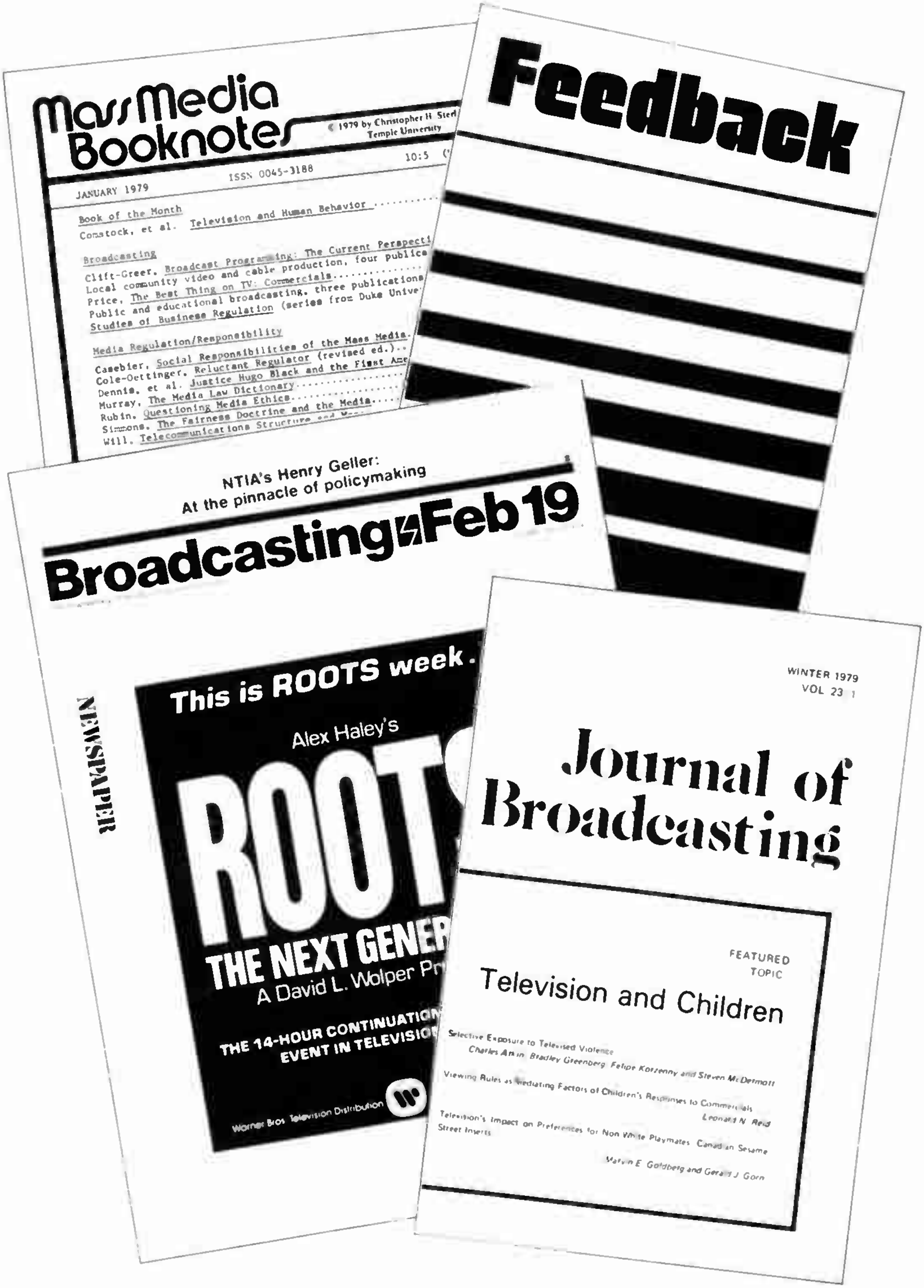
Cable News
A weekly magazine covering cable television matters.

Cablecasting
Covers engineering and technical aspects of cable television.

Cablevision
Directed toward those in the cable television industry responsible for managing, constructing and operating CATV systems.

CATV
A weekly trade publication on cable television.

Communication
A journal devoted to "conceptual/theoretical/philosophical approaches to the role of communications in human affairs."



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Temple University
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JANUARY 1979
ISSN 0045-3188
Book of the Month
Comstock, et al. Television and Human Behavior
Broadcasting
Clift-Greer, Broadcast Programming: The Current Perspective
Local community video and cable production, four publications
Price, The Best Thing on TV: Commercials
Public and educational broadcasting, three publications
Studies of Business Regulation (series from Duke University)
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Casebier, Social Responsibilities of the Mass Media
Cole-Oettinger, Reluctant Regulator (revised ed.)
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Murray, The Media Law Dictionary
Rubin, Questioning Media Ethics
Simmons, The Fairness Doctrine and the Media
Will, Telecommunications Structure and Management
Feedback
NTIA's Henry Geller:
At the pinnacle of policymaking
Broadcasting Feb 19
NEWSPAPER
This is ROOTS week.
Alex Haley's
ROOTS
THE NEXT GENERATIONS
A David L. Wolper Production
THE 14-HOUR CONTINUATION
EVENT IN TELEVISION
Warner Bros. Television Distribution
WINTER 1979
VOL. 23 1
Journal of Broadcasting
FEATURED TOPIC
Television and Children
Selective Exposure to Televised Violence
Charles Atkin, Bradley Greenberg, Felipe Korzenny and Steven McDermott
Viewing Rules as Mediating Factors of Children's Responses to Commercials
Leonard N. Reid
Television's Impact on Preferences for Non White Playmates: Canadian Sesame Street Inserts
Marvin E. Goldberg and Gerald J. Gorn

Communication Education (formerly *Speech Teacher*)
Designed to cover all aspects of teaching and learning speech communication on all levels of education. Includes articles on mass communication, public address, and instructional materials.

Communication Monographs (formerly *Speech Monographs)*
Publishes articles on general communication studies. Some articles on broadcasting and mass communication.

Communication News
Summarizes recent developments in all areas of broadcasting and telecommunication.

Communication Research
Concerned with the study of communication processes on all levels.

Communicontents (see Abstracting Services)

CPB Report
Newsletter of the Corporation for Public Broadcasting.

db
Trade publication concentrating on high fidelity and stereo recording.

Educational & Instructional Television
Contains articles and notes on recent developments and uses of television in both industry and education.

Educational Broadcasting
Contains both scholarly and general articles on ETV.

Educational Technology
Includes articles on various aspects of educational technology.

Educational Television
Covers closed circuit television in education, business, and industry.

Feedback
Articles on broadcast education.

Journal of Advertising Research
Devoted to research on advertising strategies and effects.

Journal of Broadcasting
Devoted to all aspects of broadcasting.

Journal of College Radio
Contains general articles of interest to management and staff of college radio stations.

Journal of Marketing Research
Research on effectiveness and development of marketing strategies.

Journal of Communication
On the study of communication theory, practice, and policy. Articles on such topics as television violence, censorship in broadcasting, and radio programming.

Journalism Quarterly
Covers all areas of journalism and mass communication.

Mass Media Booknotes (see Abstracting Services)

Mass Comm Review
Devoted to the study of mass communication, including broadcasting.

NAB Highlights
Affiliate newsletter of the National Association of Broadcasters.

Public Telecommunications Review
A journal of articles on public television.

The Quill
Publication of the Society of Professional Journalists, Sigma Delta Chi. Contains articles of interest to both print and broadcast journalists.

RTNDA Communicator
Newsletter of the Radio-Television News Directors Association.

Satellite Communications
For users, systems designers, common carriers, and manufacturers in the international satellite communications industry.

Television/Radio Age
Similar in some ways to *Broadcasting* but with longer, more substantial articles.

TV Communications
Devoted to cable television, it deals with topics on management systems design, finance, engineering, pay-cable, and others.

TV Guide
Local program listings and articles about radio and television.

With a good strategy and understanding of the library's organization and content, research about broadcasting will be an exciting and enjoyable experience.

glossary of terms

A.A.A.A. American Association of Advertising Agencies.

ABC (1) African Broadcasting Company; (2) American Broadcasting Company; (3) Australian Broadcasting Company.

Access channels cable television channels for general public use.

Accountable programming term used in educational television to describe a program meeting a specified set of instructional objectives.

ACT Action for Children's Television.

ADI rating term used to describe area of dominant influence.

AEJ Association for Education in Journalism.

Affiliate a broadcasting station bound by contract to associate with a particular broadcasting network or wire service.

All-channel receiver receiver capable of receiving AM and FM radio signals.

Alternator developed by Ernst Alexanderson at the General Electric Laboratories. Used to modulate early voice broadcasting.

AM amplitude modulation.

AM stereo dual-channel broadcasting on AM frequencies. A common method is to use one channel as amplitude modulation and the other channel as frequency modulation.

Anik Canadian satellite system.

Annual billings broadcast station's bill to advertisers for commercials carried over a one-year period.

AP Radio radio network of the Associated Press.

ARB Arbitron rating survey.

ARD Federal Coordinator of West German Radio Broadcasting.

Armature revolving iron core of the alternator.

ARRL American Radio Relay League.

ASCAP American Society of Composers, Authors, and Publishers.

ATS Application Technology Satellite.

Audio actuality the recording of the "actual" sounds in the news for incorporation into radio newscasts.

Audion three-element vacuum tube invented by Lee de Forest.

AWRT American Women in Radio and Television.

Banks or "buses," groups of control switches on a master control console used to program various portions of an audio or video production.

Barter trade-out advertising agreement.

BBC British Broadcasting Corporation.

BEA Broadcast Education Association.

BMI Broadcast Music Incorporated.

BRC Broadcast Rating Council.

Buses see banks.

Cash-flow statement amount of money necessary to keep the station running smoothly without going into debt.

CATV community antenna television, or cable TV.

CBC Canadian Broadcasting Corporation.

CCTV closed-circuit television.

Chain broadcasting early term used for network broadcasting.

Chart of accounts ledger used to record station finances.

Coaxial cable cable consisting of an inner wire core surrounded by a layer of plastic, metal-webbed insulation, and a third layer of plastic.

Coherer small glass tube used in Marconi's experiments to create and break an electrical connection.

Columbia term used in early broadcasting which included an identifying label for such companies as the Columbia Broadcasting System (CBS) and the Columbia Phonograph Broadcasting System, Incorporated.

Communication Model a pictorial representation of the communicative process.

Comparative balance sheet compares assets and liabilities between two points in time.

Comparative income statement compares income between two points in time.

COMSAT Communications Satellite Corporation. Formed by the Communication Satellite Act of 1962.

COMSTAR satellite system launched by NASA and leased by AT&T.

Conduction the use of ground or water, both electrical conductors, to replace a second wire in a telegraph hookup.

Construction permit permission granted by FCC to begin construction of a broadcast facility.

Co-op advertising a split in the cost of advertising usually between a retail outlet and the manufacturer.

Co-ops (1) broadcast news networks, also called "infomal networks," created by a group of radio or TV news personnel, (2) trade-out advertising agreements between advertisers and the individual advertising outlet.

CPB Corporation for Public Broadcasting.

CPM cost per thousand.

CPS cycles per second.

CRTC Canadian Radio-Television Commission.

CTNC Catholic Television Network of Chicago.

CTS Communication Technology Satellite.

CTV abbreviation for Canada's CTV Television Network, Ltd.

Cume (or cumulative audience), the number of different persons or households watching or listening to a given station or program during a certain time period.

Cume persons the number of different persons listening to a station at least once during a given time period.

CWA Communication Workers of America.

Daytimers radio stations required by the FCC to sign off at sunset.

Demographics age, sex, education level, income, and ethnic background of an audience.

Diary method method of data collection in a rating survey utilizing a diary.

Directional antennas a group of strategically placed broadcast antennas transmitting a signal in a specific direction to form an irregular rather than a circular contour.

Directional stations radio stations primarily in the AM band with directional antennas to keep their signals from interfering with those of other stations.

Director the person responsible for the entire production of a program.

Direct-wave propagation radio wave pattern of signals in direct line-of-sight transmission.

Dissolve smoothly changing from an image produced by one television camera to an image produced by a second television camera, film, slide, or videotape.

DMA Designated Market Area.

Double billing fraudulent practice of double charging advertisers.

Drop cable cable from the subtrunk of a cable system to the home terminal.

Earth station satellite earth-based receiving station.

Electromagnetic spectrum the range of levels of electromagnetic energy, called frequency.

Electromagnetic waves energy traveling through space at the speed of light. Used to transmit radio and television signals.

ENG Electronic News Gathering.

ERI Electronic Response Indicator.

ETV educational television.

FACTS Federation of Commercial Television Stations (Australia).

FBC Federal Broadcasting Corporation. (Rhodesia).

Fairness Doctrine FCC rule requiring equal air time for controversial issues.

Fiber optics the use of thin strands of glass to carry as many as 1,000 or more cable channels. Also used for data communication.

Filament element in a three-element vacuum tube. The other two are plate and grid. Early tubes used just a plate and filament.

Floor manager the person communicating the commands of the director to the performers.

FM frequency modulation.

FR3 French Regional Broadcasting Service.

Frequency (1) broadcast rating term indicating how often a viewer has tuned to a given station, (2) position on the electromagnetic spectrum.

Gatekeeper the person directly involved in relaying or transferring information from one individual to another through a mass medium.

GBC Ghana Broadcasting Corporation.

Geostationary or "synchronous," an orbiting satellite traveling at a speed proportional to that of the earth's rotation, thus appearing to remain stationary over one point on the earth.

gHz gigahertz. One billion hertz or cycles per second. (See kHz and MHz.)

Grid element in a three-element vacuum tube. The other two are filament and plate.

Ground wave waves adhering to the earth's surface.

Ham slang for amateur radio operators.

Headend the human and hardware combination responsible for originating, controlling and processing signals over the cable system.

Hertz(Hz) last name of Heinrich Rudolph Hertz commonly used as abbreviation for "cycles per second" in referring to electromagnetic frequencies.

Heterodyne Circuit improved detector of radio waves invented by Reginald A. Fessenden.

Home terminal (1) receiving set for cable TV transmissions, either one-way or two-way, (2) device connecting the drop cable of a cable system to the receiving set.

Homophily the extent to which such things as beliefs, experiences, background, culture etc. are shared by two different communicators.

HUT households using television.

Hypoing promotion efforts used to increase the size of an audience during a rating period.

IBA Independent Broadcasting Authority. (British Television Network).

IBEW International Brotherhood of Electrical Workers.

IBM International Business Machines Corporation.

ICA International Communication Association.

ILR Independent Local Radio. (British Radio Network).

Image orthicon one of the first pickup tubes used in early television broadcasting.

INA Institute Nationale de l'Audiovisuel (France).

Induction process by which a current in one antenna produces a current in a nearby antenna.

Informal networks broadcast news networks created by a professional group of radio or TV news personnel. These networks also are called co-ops.

INTELSAT International Telecommunications Satellite Organization.

Ionosphere upper level of the atmosphere reflecting radio waves back to earth.

ITU International Telecommunication Union.

ITV (1) instructional television, programming specifically designed for direct or supplemental teaching, (2) the Independent Television Network.

JCET Joint Committee on Educational Television.

kHz kilohertz. One thousand hertz or cycles per second. Measurement of a position on the electromagnetic spectrum.

Long lines term used by AT&T to describe long-distance telephone communication links.

Lowest Unit Charge minimum charge on a station rate card.

Mass audience audience reached by the mass media.

Master control console heart of a television control room operation through which both the audio and video images are fed, joined together, and improved, perhaps by special effects, for the "on-air" image.

MBS Mutual Broadcasting System.

Media plural of medium.

Media credibility the effect of various media on how mass communication messages are perceived.

Medium channel of communication such as radio or television. Singular of media.

Message intensity the value or importance of an event or its potential impact in relation to other events or potential news stories.

Meter method a broadcast ratings measurement in which a monitoring device installed on TV sets is connected to a central computer, which then records channel selection at different times of the day.

MGM Metro Goldwyn Mayer.

MHz megahertz. One million hertz or cycles per second. (See kHz and gHz.)

Microwave a very short wave of higher frequency than that of standard broadcast transmission. Usually measured in billions of cycles per second or gigahertz.

Mix to join and separate the pictures of various television cameras for a composite "on-air" image.

MPATI Midwest Program for Airborne Television Instruction.

MSA rating term used to describe metro survey area.

NAB National Association of Broadcasters.

NAEB National Association of Educational Broadcasters.

NARBA North American Regional Broadcasting Agreement.

NASA National Aeronautics and Space Administration.

NBC National Broadcasting Company.

NCTA National Cable Television Association.

NET National Educational Television.

NHK Nippon Hōsō Kyōkai (Japanese broadcasting system).

NIS now defunct radio network formerly operated by NBC.

NOS Netherlands Broadcasting Foundation.

NPR National Public Radio.

NRBA National Radio Broadcasters Association.

Opinion leader person interpreting messages originally disseminated by the mass media.

ORTF Office de Radiodiffusion-Television Française.

Oscillation valve term used by inventor J. Ambrose Fleming to describe an early tube which constituted the main component in a wireless receiver.

OT Office of Telecommunication.

Pay cable a system in which cable subscribers pay a fee in addition to the standard monthly rental fee in order to receive special programming.

PBS Public Broadcasting Service.

Perigee the closest point to the earth of a satellite's orbit.

Physical noise breakdown in communication caused by some physical quality or object interfering with the communicative process.

Plate one of three elements in a three-element vacuum tube. The other two are filament and grid. Early tubes used just a plate and filament.

Plumbicon superseding both the image orthicon and vidicon tube, the plumbicon can capture color images with the sensitivity of the human eye. It is also a trade marked name of the Amperex Corporation.

Prime time time of largest audience when station charges highest price for advertising. 7 to 11 P.M. for TV, 7 to 9 A.M. and 4 to 6 P.M. for radio. (Radio prime time can vary depending on market and lifestyle trends.)

Production companies commonly called production houses, these businesses produce broadcasting programs for adoption either by networks or individual stations through syndication.

Program 1,2,3 Swedish Radio Networks.

Program managers persons responsible for selecting programs for airing, scheduling their air time, and overseeing the production and direction of locally produced programs.

Projection an estimate of the characteristics of a total universe based on a sample of that universe.

Psychographics study of the psychological characteristics of the mass audience.

PTA National Congress of Parents and Teachers.

Public broadcasting the operation of the various noncommercial radio and television stations in the United States.

Public service advertising (PSA) designed to support a nonprofit cause or organization. Most of the time or space for this advertising is provided free as a service to the public by the print or broadcast media.

Quad abbreviation for quadraphonic.

Quadraphonic four-channel sound.

RAB Radio Advertising Bureau.

Random sampling selection process in which each unit of the larger portion has an equal chance of being selected.

Rating percentage of people in a given population who are tuned to a radio or television station during a given time period.

RCA Radio Corporation of America.

Relay satellite A device capable of bouncing messages back to earth. Echo I was the first.

Repeater satellite Satellite that could both receive and retransmit signals back to earth. The United States's Courier I-B was the first of the series.

ROS run of schedule.

RTNDA Radio Television News Directors Association.

SABC South African Broadcasting Corporation.

Sales networks a group of broadcasting stations linked together by a financial agreement to benfit all member stations by offering advertisers a joint rate.

Sampling the process of examining a small portion of something to estimate the characteristics of the larger portion.

Satcom domestic satellite system operated by RCA American Communications, Incorporated.

SBC Swedish Broadcasting Corporation.

SCA Speech Communication Association; also Subsidiary Communication Authority.

Selective exposure exposing oneself to communication believed to coincide with preconceived ideas.

Selective perception perceiving only those things which agree with preconceived ideas.

Selective retention remembering only those things which agree with preconceived ideas.

Semantic noise breakdown in communication caused by misunderstanding the meaning of words.

Share an estimate of the percentage of listeners to a particular station in comparison to listeners to all other stations or programs during a given time period.

Silicone detector crystal used in early radio receiving sets to detect radio waves.

SIN Spanish International Network.

Sky wave propagation radio-wave transmission pattern in which the signals travel up, bounce off the ionosphere, and rebound from the earth in a continuing process.

SPC Station Program Cooperative. Program acquisition method used in public television.

SPF Société Française de Production et de Creation Audiovisuelles.

SPJ, SDX Society of Professional Journalists, Sigma Delta Chi.

Subtrunk secondary cables branching out from the main trunk in a cable TV system to carry the signal to outlying areas.

Super heterodyne circuit improvement on Fessenden's hetrodyne circuit. Developed by Edwin H. Armstrong.

Supering positioning a picture from one television camera on top of another picture from a second camera. This special effect is controlled by the master control console.

Sweep rating survey period.

Switcher or "technical director," person responsible for operating the master control console.

Synchronous or "geostationary," a satellite traveling at a speed in proportion to that of the earth's rotation, thus appearing to remain stationary over one point of the earth.

Syndicator company supplying syndicated programming to networks or local stations.

Talent raid CBS's "raid" on other network talent in 1948. Term sometimes refers to similar actions by ABC in 1976.

TDF Télédiffusion de Française.

Telestar early satellite used for the first transatlantic television broadcast.

Television household a broadcast rating term used for any home merely having a television set, as distinguished from a household actually using television.

TF1 Télévision Français 1.

The Freeze term used to describe the FCC's decision to stop allocating television frequencies between 1948 and 1952.

Toll broadcasting early term for commercial broadcasting first started on WEAF.

Trade-out an agreement in which a product or service is traded for advertising on a station.

Transistor wafer-thin crystal in three layers used extensively in electronic equipment. Performs many of the functions of the three-element vacuum tube.

Translators television transmitting antennas, usually located on high natural terrain.

TSA rating term used for total survey area.

Two-step flow process by which information disseminated by mass media is (1) received by a direct audience and then (2) relayed to other persons.

Two-way cable cable system capable of both sending and receiving data.

UHF Ultra High Frequency.

Universe the whole from which a sample is being chosen. In broadcast ratings, this can be the sample area, metro area, or rating area.

UPI Audio audio network of United Press International.

Valve term used for an early two-element vacuum tube.

VHF Very High Frequency.

Vidicon sensitive television tube which followed the image orthicon.

VOA Voice of America.

VTR video tape recorder.

WARC World Administrative Radio Conference.

Wave length distance between two waves.

Westar Western Union Satellite System.

WICI Women In Communication, Inc.

Wireless term used for early radio.

Wireless telephone term used for an early invention by Nathan B. Stubblefield.

YLE YLEISRADO. Finnish broadcasting state-controlled monopoly.

notes

chapter 1

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[3] Robert A. Dutch, ed., *Roget's Thesaurus* (New York: St. Martin's Press, Inc., 1965), p. 711.
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chapter 2

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[10] McGrath, p. 781.
[11] "Signor Marconi's Experiments," *Times* (London), December 19, 1901, p. 5.
[12] Although there is much written on the early development of the Marconi companies, particularly useful to this text were W. J. Baker, *A History of the Marconi Company* (New York: St. Martins Press, Inc., 1971); Gleason L. Archer, *History of Radio to 1926* (New York: The American Historical Society, Inc., 1938); L. S. Howeth, *History of Communications—Electronics in the United States Navy* (Washington, D. C.: Bureau of Ships and Office of Naval History, 1963); Hiram L. Jome, *Economics of the Radio Industry* (London: A. W. Shaw Company, 1925); Thorn Mayes, "History of the American Marconi Company," *The Old Timer's Bulletin*, 13 (June 1972), 11–18, as cited in Lawrence W. Lichty and Malachi C. Topping, ed., *A Source Book on the History of Radio and Television* (New York: Hastings House, Publishers, 1975); Jolly, *Marconi* (cited above).
[13] The first proposed title of this company was Marconi's Patent Telegraphs Ltd., to which Guglielmo Marconi himself had objected. Source: Baker, p. 35.
[14] *Investors World*, October 7, 1898, p. 484.
[15] Howeth, p. 36.
[16] Archer, pp. 81–82.
[17] Lee de Forest, *Father of Radio* (Chicago: Wilcox & Follett Co., 1950). Fleming's work is discussed in J. A. Fleming, *An Elementary Manual of Radio Telegraphy and Radio Telephony* (London: Longmans, Green, and Co., 1908), pp. 204–11; Blake, pp. 238–40.
[18] Harlow, *Old Wires and New Waves*, pp. 462–63, as cited in Archer, p. 92.
[19] "October Meeting of the American Institute of Electrical Engineers," *Electrical World*, 43 (November 3, 1906), 836–37; also published as Lee de Forest, "The Audion, A New Receiver for Wireless Telegraphy," *The Scientific American Supplement*, November 30, 1907, pp. 348–56.
[20] J. A. Fleming, "Wireless Telegraph Receiver," 43 *Electrical World* (December 8, 1906), 1117.
[21] Lee de Forest, "Wireless Telegraph Receiver," 43 *Electrical World* (December 22, 1906), 1206. See also footnote 33.
[22] Jome, p. 208; *Marconi Wireless Telegraphy Company of America* v. *de Forest Radio Telephone and Telegraph Company*, 236 Fd. 942, affirmed by the Circuit Court of Appeals in 243 Fd. 560.
[23] de Forest, pp. 325–26.
[24] de Forest, p. 457.
[25] Charles Susskind, "de Forest, Lee," in *Dictionary of Scientific Biography Volume 3*, ed. Charles Coulston Gillispie (New York: Charles Scribner's Sons, 1975), pp. 6–7.
[26] Elliot N. Sivowitch, "A Technological Survey of Broadcasting's Prehistory," *Journal of Broadcasting* 5 (Winter 1970–71), 1–20. For the most part, research into the "induction-conduction" developments in radio's development has been overlooked by historians, partly because such approaches became scientifically obsolete in later years. Research on especially the political, economic, and social implications, still is needed. It would provide some important "micro" insights into how new scientific knowledge is applied to the invention process. Sources for such research studies are still available and more easily accessible than those of inventors in the early nineteenth century.
[27] Sivowitch, pp. 20–22; Thomas W. Hoffer, "Nathan B. Stubblefield and His Wireless Telephone," *Journal of Broadcasting*, 15 (Summer 1971), 317–29; Harvey Geller, "The Man History Overheard," *Circular-Warner/Reprise*, 7 (December 8, 1975), 1–4.
[28] Geller, p. 2.
[29] *Washington Post*, August 10, 1940: as cited in Hoffer.
[30] Hoffer, p. 322.
[31] Details of Fessenden's experiments can be found in Sivowitch, Howeth, Archer, Blake, and Barnow, as well as in other works on early wireless.
[32] Archer, pp. 102–103.
[33] de Forest, p. 268.
[34] *Ibid.*, p. 260.
[35] Information on ham radio is from Clinton B. DeSota, *Two Hundred Meters and Down: The Story of Amateur Radio* (West Hartford, Conn.: The American Radio Relay League, Inc., 1936).

chapter 3

[1] R. Franklin Smith, "Oldest Station in the Nation," in *American Broadcasting: A Sourcebook on the History of Radio and Television*, ed. Lawrence W. Lichty and Malachi C. Topping (New York: Hastings House, Publishers, 1975), pp. 114–16. (Originally published in *Journal of Broadcasting*, Winter 1959–60.

[2] Gordon R. Greb, "The Golden Anniversary of Broadcasting," in *American Broadcasting: A Sourcebook on the History of Radio and Television*, ed. Lawrence W. Lichty and Malachi C. Topping (New York: Hastings House, Publishers, 1975), pp. 95–96. (Originally published in *Journal of Broadcasting*, Winter 1958–59, pp. 3–13.

[3] *Ibid.*, p. 98.

[4] *Ibid.*, p. 102.

[5] Two accounts of WHA's early history are found in Werner J. Severin, "WHA-Madison 'Oldest Station in the Nation' and the Wisconsin State Broadcasting Service." Paper presented at the meeting of the Association for Education in Journalism, Madison, Wisconsin, 1977; *The First 50 Years of University of Wisconsin Broadcasting: WHA 1919–1969, and a Look ahead to the Next 50 Years* (Madison: University of Wisconsin, 1970.)

[6] The accounts of WWJ's early history are from R. J. McLauchlin, "What the Detroit *News* Has Done in Broadcasting," in Lichty and Topping, *American Broadcasting*, pp. 110–13. Originally published in *Radio Broadcast*, June 1922, pp. 136–41, *WWJ* (Detroit: WWJ, 1936); and brochures "WWJ Broadcasting Firsts" and "WWJ Radio One" published by WWJ in 1970, commemorating the station's sixtieth anniversary.

[7] The account of KDKA's history is from *The History of KDKA Radio and Broadcasting* (Pittsburgh: KDKA). Also found in *American Broadcasting*, pp. 13–110.

[8] *The History of KDKA*, p. 10.

[9] Gleason L. Archer, *History of Radio to 1926*. (New York: The American Historical Society, Inc., 1938), p. 164.

[10] *Ibid.*, p. 157.

[11] *Ibid.*, pp. 162–63.

[12] *Ibid.*, pp. 112–13.

[13] There are many accounts of the formation of RCA. These include, along with Archer's *History of Radio to 1926*, his *Big Business and Radio* (New York: The American Historical Society, 1939, reprinted by the Arno Press, Inc., 1971) pp. 3–22, Eric Barnouw, *A Tower in Babel* (New York: Oxford University Press, Inc., 1966), pp. 52–61.

[14] Barnouw, pp. 44–45.

[15] *Ibid.*, p. 49.

[16] W. R. MacLaurin, *Invention and Innovation in the Radio Industry* (New York: The Macmillan Publishing Co., Inc., 1949, reprinted by Arno Press, Inc., 1971), p. 123.

[17] *Ibid.*, p. 106.

[18] *Report on Chain Broadcasting* (Washington, D.C.: Federal Communications Commission, 1941), p. 10.

[19] Barnouw, p. 181.

[20] Archer, *History of Radio*, p. 276.

[21] *American Radio Journal*, 1 (June 15, 1922), 4; cited in William Peck Banning, *Commercial Broadcasting Pioneer: The WEAF Experiment* (Cambridge, Mass.: Harvard University Press, 1946), p. 94.

[22] Banning, p. 93.

[23] *Ibid.*, pp. 231–36.

[24] Archer, *Big Business and Radio*, pp. 133–65.

[25] *Ibid.*, p. 169.

[26] *Ibid.*, p. 173.

[27] *Report on Chain Broadcasting*, p. 17 (material in parentheses added).

[28] *Ibid.*, p. 92.

[29] Manuel Rosenberg, *The Advertiser*, 14 (August, 1943), 1–2, 24.

[30] FCC release (71159), October 12, 1943.

[31] *Ibid.*

[32] "Blue Sales Record an Outstanding One," Press release, Blue Network, 1942.

[33] Press release, American Broadcasting Company, March 29, 1945.
[34] Press release, American Broadcasting Company, June 15, 1945.
[35] *FCC Report on Chain Broadcasting,* p. 23.
[36] "The Way We've Been ... and Are," *Columbine,* 2 (April-May 1974), 1. Columbine is a corporate publication of CBS.
[37] *FCC Report on Chain Broadcasting,* pp. 26–28.
[38] Eric Barnouw, *The Golden Web: The History of Broadcasting in the United States* (New York: Oxford Universitv Press, Inc., 1968), p. 40.
[39] MacLaurin, p. 186.
[40] Archer, *Big Business and Radio,* p. 424.
[41] Barnouw, *The Golden Web,* p. 242.
[42] *Cox Looks at FM Radio: Past, Present and Future* (Atlanta: Cox Broadcasting Corporation), pp. 81–82.
[43] *Ibid.,* p. 82.
[44] Farnsworth's contributions to television have been overlooked by many broadcast historians, perhaps because of the familiarity of RCA and the encouragement by Sarnoff to push ahead "publicly" for television's development.
[45] Romaine Galey Hon, ed., *Headlines Idaho Remembers,* (Boise: Friends of the Bishops' House, Inc., 1977), p. 39. Reported in the *Idaho Statesman,* July 13, 1953.
[46] *Columbine,* 2 (April/May 1974), 8.
[47] Sources of the history of television recording include Albert Abramson, "A Short History of Television Recording," *Journal of SMPTE,* 64 (February 1955), 72–76; Albert Abramson, "A Short History of Television Recording: Part II" *Journal of SMPTE,* 82 (March 1973), 188–98; Joseph Roizen, "Video-Tape Recorders: A Never-Ending Revolution," *Broadcast Engineering,* April 1976, pp. 26–30; Joseph Roizen, "The Videotape Recorder Revolution," *Broadcasting Engineering,* May 1976, pp. 50, 52–53.
[48] Roizen, May 1976.
[49] Ron Whittaker, "Super 8 in Broadcasting, CATV and CCTV—Current Technology and Applications" (unpublished paper, University of Florida, Gainesville, 1975).

chapter 4

[1] *American Heritage Dictionary* (New York: American Heritage Publishing Co., Inc. and Houghton Mifflin Company, 1973), p. 45. There are many other applications of the term other than to physics and electronics. Mathematicians apply it as "the maximum ordinate value of a periodic curve," and astronomers view it as "the angular distance along the horizon from true east or west to the intersection of the vertical circle of a celestial body with the horizon." Source: *Ibid.*
[2] *Ibid.,* p. 696.
[3] See "FM Broadcast Channel Frequency Spacing," FCC/OCE RS 75–80.
[4] Lou Dorren, "Editorial," *FM 4-Channel Forum,* June, July 1976, p. 1.
[5] "California Quad 'Network' Broadcast A Resounding Success," *FM 4-Channel Forum,* 1(October/November 1976), 4.
[6] *Ibid.*
[7] The example of the car salesman is credited to "Radio Production—Four Times Better in Quad," *FM 4-Channel Forum, 1 (October/November 1976), 1.*
[8] "Do We Want Discrete Four-Channel Stereo for FM?" *Broadcast Management/Engineering,* 12 (February 1976), 40–46.
[9] *Ibid.,* p. 3. The emphasis on AM stereo was voiced at the 1976 meeting of the National Association of Radio Broadcasters.
[10] "The Road ahead Looks Smooth for AM Stereo," *Broadcast Management/Engineering,* 12 (February 1976), 48–50. If a station already has FM stereo equipment, simulcasting stereo AM is possible, although the FCC has strict nonduplication-of-programming rules.

[11] The video portion of the signal is sent over AM; the audio signal via FM. "The effective radiated power of the aural transmitter shall not be less than 10 percent nor more than 20 percent of the peak radiated power of the visual transmitter"; FCC Rules 73.682 (a) (15). The television broadcast band in the FCC Rules (73.881) are defined as "the frequencies in the band extending from 54-890 megahertz which are assignable to television stations. These frequencies are 54 to 72 megahertz (channels 2 and 4), 76 to 88 megahertz (channels 5 and 6), 174 to 216 megahertz (channels 7 through 13), and 470 to 890 megahertz (channels 14 through 83)." Because channel 6 is part of the FM broadcast band, it can be heard on the lower end of most FM radios. Approximately 4 MHz of the frequency range allocated to television stations is used for video transmission; FCC Rules, 73.699, figure 5.

[12] Not to be confused with the three primary "pigment" colors of red, yellow, and blue.

[13] FCC Rules, section 73.11(a). There can be interference from either groundwave or skywave propagation. Section 73.184 of the FCC Rules in presenting charts to measure the coverage of ground waves, defines ground wave field intensity as "that part of the vertical component of the electric field received on the ground which has not been reflected from the ionosphere nor the troposphere."

[14] FCC Rules, Section 73.11(b): "The signal is subject to intermittent variations in intensity."

[15] FCC Rules 73.11(c).

[16] FCC Rules 73.21(a).

[17] The specific definition in FCC Rules 73.21(b) (1) is "a regional channel is one on which several stations may operate with powers not in excess of 5 kilowatts. The primary service area of a station operating on any such channel may be limited to a given field intensity contour as a consequence of interference."

[18] The frequency 89.1 in New York City is reserved for the United Nations station. In Alaska, frequencies 88–100 MHz are allocated exclusively to government radio services. Frequencies 11.1–107.9 MHz are allocated to Alaskan, noncommercial broadcast use. FCC Rules, 73.501(a).

[19] Information on ITU activities are found in annual ITU reports and the *Yearbook of the United Nations.*

[20] FCC Rules, 73.183(b), 73.183(c).

chapter 5

[1] "Video Entertainment Offers Chicago Its First Pay TV Channel via Microwave," *Communications News,* 13 (September 1975), 14.

[2] D. Dean VanUitert, "Microwave Expands Campus Borders," *Educational and Industrial Television,* 6 (November 1974), 58–59, 60–63.

[3] Indiana Higher Education Telecommunications System (IHETS).

[4] Richard Witkin, "Live Images Transmitted across Ocean First Time," *New York Times,* July 11, 1962, p. 16. Also, Richard Witkin, "Europeans Beam First Television to Screens in U.S.," *New York Times,* July 12, 1962, pp. 1, 12. The specific agreement, "Cooperative Agreement between the National Aeronautics and Space Administration and the American Telephone and Telegraph Company for the Development and Experimental Testing of Active Communications Satellites" provided back-up launching systems, and all data resulting from the experiments were to be made available to NASA.

[5] Anthony Lewis, "Sarnoff Suggests Industry Merger," *New York Times,* August 8, 1962, pp. 1, 14.

[6] Eventually, Western Union operated its own satellite system.

[7] Jack Gould, "TV: Telstar and World Broadcasting," *New York Times,* July 11, 1962, p. 71.

[8] Leonard H. Marks summarized these events in an article in the *Journal of Broadcasting* entitled "Communication Satellites: New Horizons for Broadcasters," 9 (Spring 1965), 97–101. The article also summarized issues and asked probing questions.

[9] Source of the account of the launch and Hughes Aircraft Company's part in it. "Mr. Watson I Want You," *Vectors,* 15 (Summer, Fall, 1973), 7–9.
[10] "Interactive Satellite ATS-6 Brings People Together," *Broadcast Management Engineering,* 10 (November 1974), 30–44.
[11] International development is cited in "A Television Station Goes into Orbit," *Business Week,* February 16, 1976, p. 36H.
[12] Marks, p. 100.
[13] Dallas W. Smythe, "Space-Satellite Broadcasting: Threat or Promise?" *Journal of Broadcasting,* 4 (Summer 1960), 193–94.
[14] "Federal Regulatory System Seen as Inadequate to Requirement for Orderly Telecommunications Change," Cambridge, Mass.: Arthur D. Little Inc., August 27, 1976.
[15] For example Michael Kinsley, "Is AT&T Hamstringing Comsat?" *New York Times,* June 13, 1976, sec. F, p.11.
[16] AT&T, *1975 Annual Report to Shareholders,* p.5.

chapter 6

[1] Susan Q. Kelly, Public Affairs Coordinator, National Cable Television Association. Letter to the author, December 8, 1976. Source of Oregon and Pennsylvania beginnings.
[2] Figures on the size of the industry are compiled from material supplied by the National Cable Television Association, as well as from *Cable Sourcebook, 1979* (Washington, D.C.: Broadcasting Publications, Inc., 1978).
[3] Examples of cable use in secondary education are found in *Cable Television and Education: A Report from the Field* (Washington, D.C.: National Cable Television Association, 1973).
[4] *Ibid.,* p. 8. Bond issues.
[5] *Communication Properties, Inc.,* in *1973 Annual Report,* p. 11.
[6] Rolland C. Johnson and Donald Agostino, "The Columbus Video Access Center: A Research Evaluation of Audience and Public Attitudes," (Bloomington: Institute for Communication Research. Indiana University, 1974).
[7] Rudy Bretz, "Public-Access Cable TV: Audiences," *Journal of Communication,* 25 (Summer 1975), 29.
[8] *Ibid.,* p. 30.
[9] Pamela Doty, "Public-Access Cable TV: Who Cares?" *Journal of Communication,* 25 (Summer 1975), 33–41. Sometimes, however, there is controversy. See Alan Wurtzel, "Public-Access Cable TV: Programming," *Journal of Communication,* 25 (Summer 1975), 20.
[10] *Ibid.*
[11] *Ibid.*
[12] Clifford M. Kirtland, Jr., "Room for All," Speech delivered to the annual meeting of the Institute of Broadcasting Financial Management, Boston, September 14, 1976.
[13] Anne W. Branscomb, "The Cable Fable: Will it Come True?" *Journal of Communication,* 25 (Winter 1975), 52.
[14] Federal Regulatory System Seen as Inadequate to Requirement for Orderly Telecommunication Change" (Cambridge, Mass.: Arthur D. Little, Inc., 1976).
[15] The categories included are based upon Walter S. Baer, *Cable Television: A Handbook for Decision Making* (Santa Monica, Calif.: The Rand Corporation, 1973), p. 46.
[16] *Ibid.,* p. 57.
[17] A very conservative estimate based on TelePrompTer's average as listed in their *1973 Report,* p. 8.
[18] Source of illustration and data: *Cox Looks at the Future* (Atlanta: Cox Broadcasting Corporation, 1975).
[19] *Ibid.*
[20] Rolland C. Johnson and Robert T. Blau, "Single Versus Multiple-System Cable Television," *Journal of Broadcasting,* 18 (Summer 1974), 326.
[21] *Ibid.,* p. 324.

[22] R.E. Park, *Prospects for Cable in the 100 Largest Television Markets* (Santa Monica, Calif.: The Rand Corporation, 1971).
[23] References to the Arthur D. Little, Inc. study in the section *Future of Cable*, are from Arthur D. Little, Inc., 1976 (press release).
[24] *Cox Looks at the Future.*

chapter 7

[1] The author is grateful for the material furnished by the three commercial networks, numerous syndication companies, and the wire services. Executives of these organizations and station management who willingly participated in interviews with the author also are acknowledged.
[2] From the UPI Advisory Board by-laws provided the author by UPI, "In the Matter of: Inquiry into Subscription Agreements between Radio Broadcast Stations and Musical Format Service Companies," Docket No. 19743, FCC, November 7, 1975.
[3] *Ibid.*

chapter 8

[1] The account of the experimental broadcast is from C. C. Clark, "Television in Education," *School and Society*, 48 (October 1, 1938), 431–32.
[2] "Metropolitan Art Is to Be Televised," *New York Times*, May 26, 1941, p. 21.
[3] The account of the series is from "NBC's Educational Television Series," *School and Society*, 63 (February 16, 1947), 110.
[4] William M. Dennis, "Transition to Visual Education," *NEA Journal*, 35 (October, 1946), 424.
[5] Amo DeBernardis and James W. Brown, "A Study of Teacher Skills and Knowledge Necessary for the Use of Audio-Visual Aids," *Elementary School Journal*, 46 (June 1946), 550–56.
[6] "A Research Fellowship in Television Education," *School and Society*, 69 (April 16, 1949), 278.
[7] As reported in "The U.S. Commissioner of Education on Television," *School and Society*, 72 (December 23, 1950), 427.
[8] "Colleges and Universities Prepare Television Programs," *School and Society*, 72 (September 2, 1950), 155–56.
[9] *Ibid.*, October 3, 1951, p. 44.
[10] A general overview and summary of these issues appeared in the *Journal* of the National Education Association, by Vivian Powell, then president of the NEA Department of Classroom Teachers. See Vivian Powell, "Here's How Teachers Look at ITV," *NEA Journal*, (November 1957), 506.
[11] For a history of the MPATI program, see Norman Felsenthal, "MPATI: A History 1959–1971," *Educational Broadcasting Review*, 5 (December 1971), 36–44.
[12] As discussed in Richard J. Stonesifer, "The Separation Needed between ETV and ITV," *AV Communication Review*, 14 (Winter 1966), 489–97.
[13] *Ibid.*, p. 490, citing Doris Willens, "ETV: An Uncertain Trumpet," *Television Magazine*, 21 (February 1964).
[14] Jerome S. Bruner, *Toward A Theory of Instruction* (Cambridge, Mass.: Harvard University Press, 1966), pp.10–11. As cited in Edgar Dale, *Audiovisual Methods in Teaching* (Hinsdale, Ill.: Dryden Press, 1969), p. 108.
[15] *Ibid.*, p. 110.

[16] See also Walter Wager, "Media Selection in the Affective Domain: A Further Interpretation of Dale's Cone of Experience for Cognitive and Affective Learning," *Educational Technology*, July 1975, pp. 9–13.
[17] P. Kenneth Komoski. Statement to the U.S. House of Representatives Committee on Education and Labor in "Hearings: To Establish a National Institute of Education," 92nd Congress, First Session (Washington, D.C.: U.S. Government Printing Office, 1971). Cited in "Evaluating Instructional TV," *Educational Broadcasting*, 7 (May/June 1974), 12. Although Komoski made the statement in 1971, there still is criticism of ITV's accountability. See George Hall, "Is It Time to Turn ITV Off?" *Public Telecommunication Review*, 4 (May/June 1976), 15–20.
[18] Harold B. McCarty, "Educational Radio's Role," *NAEB Journal*, 18 (October 1958), 3–6, 26–29.
[19] "Carnegie Commission II," *Public Telecommunication Review*, 5 (May/June 1977), 13–14.

chapter 9

[1] Based on 600 companies using television in 1976, having grown twofold in three years, and there being somewhat more than 700 commercial television stations in 1976. Source of corporate estimate: Judith M. Brush, "Private Television Communications," *Matrix*, 62 (Winter 1976–77), 14–15, 30.
[2] *Ibid.*, p. 15.
[3] *Ibid.*, p. 15.
[4] William L. Cathcart, "Television and Industry: How a New Trend Relates to Students," *Feedback*, 18 (May 1976), 11–14.
[5] "Image Building Begins at Home," *Chemical Week*, (November 19, 1975), 5.
[6] *Ibid.*
[7] The account of the First National City Bank's programming is from Eugene Marlow, "Programming for a Company Television News Show," *Educational and Industrial Television*, 6 (April 1974), 30, 33–37.
[8] Greg Stark and Rod Rightmier, "Around the Clock Video for Employee Communication," *Educational & Industrial Television*, 7 (February 1975), 18, 20–21.
[9] Source: "What's on JDTV?" *JD Journal*, 5 (Summer 1976), 7–9. Also: "Deere and Company: All out for Quality," *IVC Field Report*. International Video Corporation, 1975.
[10] "Tube Power: Reaching New Frontiers with Reliance Television," *Intercom*, (February 1976), 4–5.
[11] "Television Turns on at Owens-Corning," *Dialogue*, (October 1974), 4–5.
[12] *Honeywell Education: Multimedia Instructional Systems* (Wellesley Hills, Mass.: Honeywell, 1976). Corporate Brochure.
[13] "Holiday Inn's Vidnet System Helps in Training Employees," *Communications News*, 14 (October 1976), 36.
[14] Warren R. Wille, "The Dana Approach—A Management Information System," *Educational & Industrial Television*, 6 (January 1974), 10–12.
[15] "Extending Our Vision with the Video Communication System," *Viewpoints*, (November/December 1976), 16–18.

chapter 10

[1] The author is deeply indebted to stations, networks, governments, and individuals who have generously contributed information for this chapter not only in books and literature but in private correspondence.

[2] The CFCF-AM case is chronicled in both the 1975–76 and 1976–77 CRTC annual reports.
[3] Phil Gibson, "Canadians Fence off TV Violence," *Christian Science Monitor*, February 10, 1976.
[4] *BBC Handbook* (London: BBC, 1977), p. 207.
[5] The author acknowledges the generous help of both MTV and YLE in preparing the paragraphs on Finnish broadcasting. One of the most concise summaries of French broadcasting is found in Milton Hollstein, "French Broadcasting after the Split," *Public Telecommunication Review*, 6 (January/February 1978), 15–19.
[6] David E. Powell, "Television in the U.S.S.R.," *Public Opinion Quarterly*, 39 (Fall 1975), 287–300.
[7] Australian Broadcasting Commission *Annual Report*, 1975–1976.
[8] "Demonstration of the Experiment of Hi-OVIS Prototype," Publication of the Visual Information System Development Association, November 1976.
[9] *NHK 1976–77* (Tokyo: NHK, 1977), p. 2.
[10] *40 Years of Broadcasting in Ghana* (ACCRA: GBC, 1975).
[11] *Ibid.*, p. 8.
[12] *Broadcasting in the Seventies* (Salisbury, Rhodesia, n.d.). Correspondence from the RBC is also especially acknowledged.
[13] Peter B. Orlik, "Co-opting the Messenger: The Afrikaner Take-Over of the South African Broadcasting Corporation." Paper presented at the 1977 meeting of the Association for Education in Journalism, Madison, Wisconsin.
[14] Emile G. McAnany, *Radio's Role in Development: Five Strategies of Use* (Washington, D.C.: Academy for Educational Development, 1973), pp. 5–21. McAnany's review of international literature is comprehensive, and the student doing serious research on instructional radio will find it valuable.
[15] Wilbur Schramm, *Instructional Television in the Educational Reform of El Salvador* (Washington, D.C.: Academy for Educational Development, 1973).
[16] *Ibid.*, pp. 4–5. Gains were for seventh- and eighth-grade classes in 1970 and seventh grade in 1971 but not for eighth and ninth in 1971. Albeit with cautious optimism, p. 45.
[17] *Ibid.*, pp. 6–7.
[18] *Educational Technology and the Developing Countries* (Washington, D.C.: Agency for International Development, 1972), p. 81. As cited in Lynne Masland and Grant Masland, "The Samoan ETV Project," *Educational Broadcasting*, 8 (March/April 1975), 13–16.
[19] Masland and Masland, p. 15.
[20] *Ibid.*, p. 16.
[21] The Ivory Coast Republic, *Education by Television—Volume 3, Report of the Missions for the Evaluation of Educational Television in Niger, El Salvador, and American Samoa*, Ministry of National Education, approximate date of publication: 1969, p. 26. As cited in Masland and Masland. Another source on the early use of ETV in American Samoa is Wilbur Schramm, "Educational Television in American Samoa," in *New Educational Media In Action: Case Studies for Planners—Volume 1*, ed. Wilbur Schramm and others (Paris: UNESCO, IIEP, 1967), p. 16.
[22] Reference to ETV in Malaysia is from Charles B. Klasek, "ITV in a Developing Nation," *Educational Broadcasting* (November/December 1975), 33–5, 46.

chapter 11

[1] The Wireless Ship Act of 1910. Public Law 262, 61st Congress, June 24, 1910.
[2] The Radio Act of 1912, Public Law 264, 62nd Congress, August 13, 1912, sec. 1.
[3] See Edward F. Sarno, Jr., "The National Radio Conferences," *Journal of Broadcasting*, 13 (Spring 1969), 189–202.

[4] *Ibid.* For a summary of the Department of Commerce's action during this period see Marvin R. Bensman, "Regulation of Broadcasting by the Department of Commerce, 1921–1927," in *American Broadcasting: A Source Book on the History of Radio and Television,* ed. Lawrence W. Lichty and Malachi C. Topping (New York: Hastings House, Publishers, 1975), pp. 544–55.
[5] *Hoover* v. *Intercity Radio Co., Inc.* 286 F. 1003 (D. C. Cir), February 25, 1923.
[6] *United States* v. *Zenith Radio Corporation et al.* 12F. 2d 614 (N. D. Ill.), April 16, 1926.
[7] Eric Barnouw, *A Tower in Babel: A History of Broadcasting in the United States* (New York: Oxford University Press, Inc., 1966), p. 175.
[8] Attorney General's Opinion, 35 Ops. Att'y Gen. 126, July 8, 1926, As cited in Kahn.
[9] H. Doc. 483, 69th Congress, 2nd Session. As cited in Kahn.
[10] The Radio Act of 1927, Public Law 632, 69th Congress, February 23, 1927, Sec. 3.
[11] S. Doc. 144, 73d Congress, 2d Session, February 26, 1934. President Franklin D. Roosevelt's message to Congress suggesting the formation of the Federal Communications Commission.
[12] *Ibid.*, Sec. 326.

chapter 12

[1] *FCC Annual Report, 1974*, pp. 2–3.
[2] Based on "The FCC and Broadcasting," FCC Broadcast Bureau publication # 8310-100.
[3] However, "staged" news events are not considered to be in the public interest.
[4] "The FCC and Broadcasting."
[5] A report of the Commission's first open meeting is chronicled in "Like a Day with the Sunshine at the FCC," *Broadcasting,* 46 (March 28, 1977), 29. Procedural policy was announced in "FCC in the Sunshine," NAB *Highlights,* 3 (March 7, 1977), 2.
[6] Nicholas Johnson and John Jay Dystel, *A Day in the Life: The Federal Communications Commission,* 82 *Yale Law Journal,* (1973), 1575–1634.
[7] *Ibid.*
[8] Nicholas Johnson and John Dystel are critical of the rule permitting a maximum of seven AM, FM, or TV stations to be owned by the same company. What was intended as a "per se maximum" has been converted into a "presumptively permissible number." Source: *Ibid.*
[9] On December 13, 1972. Source: *Ibid.*
[10] See Lawrence W. Lichty, "Members of the Federal Radio Commission and the Federal Communications Commission 1927–1961," *Journal of Broadcasting,* 6 (Winter 1961–62), 23–24; Lawrence W. Lichty, "The Impact of FRC and FCC Commissioners' Background on the Regulation of Broadcasting," *Journal of Broadcasting,* 6 (Spring 1962), 97–110.
[11] Wenmouth Williams Jr., "Impact of Commissioner Background on FCC Decisions: 1962–1975," *Journal of Broadcasting,* 20 (Spring 1976), 239–60.
[12] As discussed in FCC publications, *FCC Annual Reports, Broadcasting Yearbook,* and "How the FCC Is Organized into Offices and Bureaus," *Communication News,* 14 (January 1977), 46–48; "FCC Makes over Broadcast Bureau," *Broadcasting,* 45 (April 5, 1976), 53.
[13] See "FCC Lab Tests Radios for Rule Compliance," *Communication News,* 14 (January 1977), 50.
[14] *FCC Annual Report,* 1974.
[15] The Policy and Rules Division was formed in 1976 as a consolidation of the Rules and Standards Division and the Research and Education Division.
[16] The importance of cable as a "developing" medium is evident in the presence of two divisions directed toward future growth issues, the Research Division and the Policy Review and Development Division.
[17] *FCC Annual Report,* 1974, p. 78.

[18] Donald M. Gilmor and Jerome A. Barron, *Mass Communication Law* (St. Paul: West Publishing Company, 1974), p. 889, citing Richard Sneed, 15 P. &. F. Radio Reg. 158 (1967).
[19] *Ibid.*, p. 78, citing Mile High Stations, Inc., 28 FCC 795, 20 P. & F. Radio Reg. 345 (1960).
[20] As reported in *Broadcasting*, 46 (June 20, 1977), 68.
[21] *FCC Annual Report*, 1974, pp. 37–38.
[22] See Charles Clift, III., Fredric A. Weiss, and John D. Abel, "Ten Years at Forfeitures by the Federal Communications Commission," *Journal of Broadcasting*, 15 (Fall 1971), 379–85.
[23] *Ibid.* Categories are as defined in the Communications Act. The period covered was 1961 through June 1971.
[24] Authority granted by the same statute permitting forfeitures.
[25] *FCC Annual Report*, 1974, p. 37.
[26] Maurice E. Shelby, Jr., "Short-Term License Renewals: 1960–1972," *Journal of Broadcasting*, 18 (Summer 1974), 277–88.
[27] *Ibid.*, p. 282.
[28] Johnson and Dystel.
[29] *Ibid.*
[30] Erwin G. Krasnow and Lawrence D. Longley, *The Politics of Broadcast Regulation* (New York: St. Martin's Press, Inc. 1973), p. 25.
[31] *Ibid.*, p. 25.
[32] Marc C. Franklin, *The First Amendment and the Fourth Estate* (Mineola, N.Y.: The Foundation Press, Inc., 1977), pp. 465–66.
[33] *Ibid.*, p. 466. It is interesting to note that although not adhering to "regional" assignments of frequencies on a domestic scale, international agreements on frequency management are regional. Franklin points out the peculiar nature of the electromagnetic spectrum as a resource. When the overall territory (the world) is big enough, regional allocations are practical. Moreover, the political realities of trying to localize spectrum management on a world scale makes the task almost impossible.
[34] *A Study of the Federal Communications Commission's Equal Employment Opportunity Regulation—An Agency in Search of a Standard* (Washington, D.C.: Citizens Communications Center, 1976).
[35] *Window Dressing on the Set: Women and Minorities in Television* (Washington, D.C.: United States Commission on Civil Rights, 1977).
[36] Joseph A. Grundfest, *Citizen Participation in FCC Decision Making* (Santa Monica, Calif: The Rand Corporation, 1976).
[37] Erwin G. Krasnow and Lawrence D. Longley, *The Politics of Broadcast Regulation* (New York: St. Martin's Press, Inc., 1973), p. 24.
[38] Robert R. Smith and Paul T. Prince, "WHDH: The Unconscionable Delay," *Journal of Broadcasting*, 18 (Winter 1973–74), 85–86.
[39] Sterling Quinlan, *The Hundred Million Dollar Lunch* (Chicago: J. Philip O'Hara, Inc., 1974), p. 4.
[40] "FCC Berated for Policy on Stockholdings of the Employees," *Broadcasting*, 46 (May 30, 1977), 28, 30.
[41] Johnson and Dystel.

chapter 13

[1] Harold L. Nelson and Dwight L. Teeter, Jr., *Law of Mass Communications* (Mineola, N.Y.: The Foundation Press, Inc., 1973), p. 1.
[2] Lee Loevinger, "The Role of Law in Broadcasting," *Journal of Broadcasting*, 8 (Spring 1964), 115–17.
[3] *Ibid.*

[4] Blasi, *The Newsman's Privilege: An Empirical Study,* 70 *Michigan Law Review,* 233 (December, 1971).

[5] Loevinger, pp. 115–17.

[6] Section 73.120. Two publications have updated rules and regulations and have provided guidelines to broadcasters in interpreting Section 315. These are "Uses of Broadcast and Cablecast Facilities by Candidates for Public Office," Fed. Reg. 5796; and "Licensee Responsibility Under Amendments to the Communications Act of 1971," FCC *Public Notice,* June 5, 1974, 47 FCC 516 (1974).

[7] Gilmor and Barron, p. 230. *Farmers Educational and Cooperative Union of America, North Dakota Division* v. *WDAY,* 89 N. W. 2d 102, 109 (N. D. 1958).

[8] *Farmers Educational and Cooperative Union of America* v. *WDAY Inc.,* 360 U. S. 525, 79 S. Ct. 1302, 3 L. Ed. 2d 1407 (1959).

[9] "Reinterpretation of Equal Time Passes First Court Challenge," *Broadcasting,* 45 (April 19, 1976), 26–27.

[10] 74 Sta. 554 (1960). Gilmor and Barron, p. 797.

[11] "Use of Broadcast and Cablecast Facilities by Candidates for Public Office," FCC *Public Notice,* March 16, 1972; 37 *Fed. Reg.* 5804, March 21, 1972.

[12] *In the Matter of Editorializing by Broadcast Licensees,* 13 FCC 1246, June 1, 1949.

[13] Great Lakes Broadcasting Co., 3 F. R. C. Ann. Rep. 32 (1929), modified on other grounds, 37, F. 2d 993 (D. C. Cir.) certiorari dismissed, 281 U. S. 706 (1930). As cited in Franklin, p. 601.

[14] *In the Matter of the Mayflower Broadcasting Corporation and The Yankee Network, Inc. (WAAB),* 8 FCC 333, 338, January 16, 1941.

[15] *Ibid.*

[16] *Ibid.*

[17] In reference to United Broadcasting Co. (WHKC) 10 FCC 515 June 26, 1945.

[18] In reference to Petition of Robert Harold Scott for Revocation of Licenses of Radio Stations KQW, KPO and KFRC, 11 FCC 372, July 19, 1946.

[19] *In the Matter of Editorializing by Broadcast Licensees,* 13 FCC 1246, June 1, 1949.

[20] "Applicability of the Fairness Doctrine in the Handling of Controversial Issues of Public Importance", 29 *Fed. Reg.* 10416, July 25, 1964.

[21] *Red Lion Broadcasting Co.* v. *Federal Communications Commission.* 127 U. S. App. D. C. 129, 381 F. 2d 908 (1967). *Red Lion Broadcasting Co., Inc.* v. *Federal Communications Commission. United States* v. *Radio-Television News Directors Association.* 395 U.S. 367, 89 S. Ct. 1794, 23 L. Ed. 2d 371 (1969). The cases are well documented in numerous legal texts. The reader is referred to the latest edition of Gilmor and Barron for a detailed discussion as well as for pertinent questions on the decision. (Further citations of the case in this book are listed as "Red Lion.")

[22] *Radio-Television News Directors Association* v. *United States,* 400 F. 2d 1002 (7th Cir. 1968).

[23] *Red Lion.*

[24] "Fairness Case Goes against Eight California Radio Stations," *Broadcasting,* 45 (May 24, 1976), 40, 42. A discussion of the legal aspects of editorial advertising is found in Milan D. Meeske, "Editorial Advertising and the First Amendment," *Journal of Broadcasting,* 17 (Fall 1973), 417–26.

[25] For the early development of legal precedent in the area of regulating obscene, indecent, and profane programming, see James Walter Wesolowski, "Obscene, Indecent, or Profane Broadcast Language as Construed by the Federal Courts," *Journal of Broadcasting,* 13 (Spring 1969), 203–19.

[26] Title 18, United States Code (Codified June 25, 1948, Ch. 645, 62 Stat. 769).

[27] Sonderling Broadcasting Corporation, WGLD-FM, 27 Radio Reg. 2d 285 (FCC, 1973). The appeals case affirming the FCC ruling is *Illinois Citizens Committee for Broadcasting* v. *Federal Communications Commission,* 515 F. 2d 397 (D. C. Cir. 1975). The *Ginzburg* ruling cited in the text is *Ginzburg* v. *United States,* 383 U. S. 463, 86 S. Ct. 942, 16 L. Ed. 2d 31 (1966). See also Charles Feldman and Stanley Tickton, "Obscene/Indecent Programming: Regulation of Ambiguity," *Journal of Broadcasting,* 20 (Spring 1976), 273–82.

[28] *Pacifica Foundation,* 56 FCC 2d 94 (1975).

[29] *Ibid.*

[30] *Third Report and Order* in Docket No. 19622, FCC 75-542, May 13, 1975. The different times result from different network feed times to affiliates in the various time zones. For two perspectives on the sports antiblackout issue, see Ira Horowitz, "Sports Telecasts: Rights and Regulations," *Journal of Communication*, 27 (Summer 1977), 160–68; John J. Siegfried and C. Elton Hinshaw, "Professional Football and the Anti-Blackout Law," *Journal of Communication*, 27 (Summer 1977), 169–74.

[31] *National Association of Independent Television Producers and Distributors et al* v. *FCC*, CA No. 75-4021, April 21, 1975.

[32] *Rideau* v. *Louisiana*, 373 U. S. 723, 10 L. Ed. 2d 663, 83 S. Ct. 1417 (1963).

[33] *Estes* v. *State of Texas* 381 U. S. 532, 85 S. Ct. 1628, 14 L. Ed. 2d 543 (1965).

chapter 14

[1] The text does not quote, except where indicated, verbatum from FCC regulations. Logging requirements vary among types of stations. Some provide more detailed information than others (although staying within FCC guidelines), and many stations use automatic logging systems. The reader wishing to check the exact language of the law should consult sections 73.111 (AM), 73.281 (FM), and 73.669 (TV) for exact wording.

[2] FCC Field Operations Bureau. *Broadcast Operators Handbook* (Washington, D.C.: Federal Communications Commission, 1976), p. 79. Along with FCC rules, a discussion of station identification announcements can be found in Frederick W. Ford and Lee G. Lovett, "Station Identification Announcements," *Broadcast Management/Engineering*, 13 (December 1976), 24, 27.

[3] FCC rules section 73.112 (AM), 73.282 (FM), 73.670 (TV). For further discussion of program log requirements, consult Frederick W. Ford and Lee G. Lovett, "Program Log Requirements," *Broadcast Management/Engineering*, 13 (April 1976), 22, 24, 26. Note also the National Association of Broadcasters program log recommendations.

[4] FCC Rules 73.112 (AM), 73.282 (FM), 73.670 (TV).

[5] *Perry's Broadcasting and the Law*, August 1, 1976, p. 2.

[6] FCC Rules 73.111 (general), 73.115 (retention), 73.116 (availability), 73.113 (AM), 73.283 (FM), 73.671 (TV).

[7] Assuming there is no interruption.

[8] *Broadcast Operators Handbook*, p. 84.

[9] Thomas F. Baldwin and Stuart H. Surlin, "A Study of Broadcast Station License Application Exhibits on Ascertainment of Community Needs," *Journal of Broadcasting*, 14 (Spring 1970), 157–70. A further perspective of the ascertainment process is found in Stuart H. Surlin and Less Bradley, "Ascertainment through Community Leaders," *Journal of Broadcasting*, 18 (Winter 1973–74), 97–107; Joseph M. Foley, "Ascertaining Ascertainment: Impact of the FCC Primer on TV Renewal Applications," *Journal of Broadcasting*, 16 (Fall 1972), 387–406; Stuart H. Surlin, "Ascertainment of Community Needs by Black-Oriented Radio Stations," *Journal of Broadcasting*, 16 (Fall 1972), 421–29; Kenneth W. Hirsch and John C. Hwang, "Community Problems Measurement and Policy Setting" (Sacramento, Calif: Department of Communication Studies, California State University).

[10] "In the Matter of Primer on Ascertainment of Community Problems by Broadcast Applicants," *Federal Register*, 36 (March 3, 1971). Three different terms tend to be interchanged when discussing ascertainment: "problems," "issues," and "needs." All refer to what is wrong with a community and how the broadcaster can help to correct it.

[11] "Ascertainment of Community Problems by Broadcast Renewal Applicants Primer," *Federal Register*, 41 (January 7, 1976), adopted in 1975; "Ascertainment of Community Problems by Noncommercial Educational Broadcast Applicants, Permittees, and Licensees," *Federal Register*, 41 (March 25, 1976).

[12] Ascertainment Primer, 1382.

[13] The object, from management's perspective, is not only to learn what the needs of the community are but also to show that more than adequate measures have been taken to assure that these groups are represented in the survey and to avoid any question about procedure should a license challenge develop. Also see Frederick W. Ford and Lee G. Lovett, "New Community Ascertainment Guidelines for Broadcast Renewals," *Broadcast Management/Engineering,* 12 (March 1976), 26, 28, 32, 34.

[14] Herschel Shosteck, "Dangers of Mail Surveys in Ascertainment Proceedings," *Journal of Broadcasting,* 16 (Fall 1972), 431–39. Also David J. LeRoy and Donald F. Ungurait, "Ascertainment Surveys: Problem Perception and Voluntary Station Contact," *Journal of Broadcasting,* 19 (Winter 1975), 23–30.

[15] Along with the FCC Ascertainment Primer, other sources are available to assist broadcasters in conducting the various surveys used in ascertainment. Two of these are Bradley S. Greenberg, Thomas F. Baldwin, Byron Reeves, Lee Thornton, and Jack Wakshlag, *An Ascertainment Handbook for Public Broadcasting Facilities* (Washington, D.C.: Corporation for Public Broadcasting, 1975), prepared under a grant to the Departments of Communication and Telecommunication at Michigan State University. Material from the Greenberg *et al.* report is included in a report of the same title, copyrighted by CPB in 1976. Also, NAB stations received an NAB Legal *Memorandum* on "Ascertainment of Community Needs," in June 1976.

[16] Each radio frequency represents a "channel" on the AM or FM band.

[17] The concern here is mostly with the percentage ratio between entertainment and sufficient local (5 percent), informational (5 percent), and nonentertainment (10 percent) programming. Promised percentages which are less than the minimum are examined closely.

[18] Permitted to be exceeded by 10% at election time.

[19] For a perspective of how this affects public broadcasting see Robert K. Avery, "Public Broadcasting and the Duopoly Rule," *Public Telecommunications Review,* January/February 1977, pp. 29–37.

[20] *National Citizens Committee for Broadcasting* v. *Federal Communications Commission et al.* No. 75–1064 (D.C. Cir.).

chapter 15

[1] Lee Loevinger, "The Future of Television," *Television Quarterly,* 4 (Fall 1965), 41–52.

[2] A discussion of compromise in the 1972 rules and an example of the issues confronting a local change of service are found, respectively, in Harvey Jassem, "The Selling of the Cable TV Compromise," *Journal of Broadcasting,* 17 (Fall 1973), 427–36; and Norman Felsenthal, "Cherry-Picking, Cable, and the FCC," *Journal of Broadcasting,* 19 (Winter 1975), 43–53. Citation of the *Southwestern* case is: *United States* v. *Southwestern Cable Co.,* 392 U.S. 157 (1968). The 1972 rules were issued in: *Cable Television Report and Order,* 36 FCC 2d 143 (1972).

[3] Discussion of specific cable rules can be found in *Regulatory Developments in Cable Television.* (Washington, D.C.: Federal Communications Commission, May, 1977); definitions cited on pp. 7–8. See also the most recent editions of the *Cable Sourcebook.*

[4] Vernone Sparkes, "Local Regulatory Agencies for Cable Television," *Journal of Broadcasting,* 19 (Spring 1975), 228–29.

[5] *FCC Information Bulletin* "Cable Television", March, 1979.

[6] *Regulatory Developments in Cable Television,* p. 6.

[7] *Ibid.,* pp. 8–10.

[8] *Ibid.,* p. 10.

[9] *Ibid.*

[10] *Ibid.,* p. 11. FCC Opinion is stated in: *Report and Order in Docket 20028,* 48 FCC 2d 699, 39 *Fed. Reg.* 33528 (1974), and *Memorandum Opinion and Order in Docket 20028,* 54 FCC 2d 1182, 40 Fed. Reg. 39509 (1975).

[11] *Ibid.* See *Report and Order in Docket 19859*, 57 FCC 2d 68 (1975), 41 *Fed. Reg.* 1063 (1976).
[12] *Ibid.* See *Report and Order in Docket 19859*, 57 FCC 2d 68 (1975), 41 *Fed. Reg.* 1063 (1976).
[13] *Ibid.*, pp. 14–15. *Notice of Inquiry in Docket 20988*, 41 *Fed. Reg.* 50055 (1976).
[14] Frederick W. Ford and Lee G. Lovett, "State Regulation of Cable Television, Part I: Current Statutes," *Broadcast Management/Engineering*, 10 (June 1974), 18, 21, 50; Frederick W. Ford and Lee G. Lovett, "State Regulation of Cable TV, Part II: States with No CATV Statutes; Short-Term and Long-Term Trends," *Broadcast Management/Engineering*, 30 (June 1974) 20, 21, 22.
[15] Cited in Benno Signitzer, *Regulation of Direct Broadcasting from Satellites: The U.N. Involvement* (New York: Praeger Publishers, Inc., 1976), p. 21, footnoting a quotation by Eilene Galloway in "Broadcast Satellites." Paper presented at Seventh Colloquium on the Law of Outer Space, International Institute of Space Law, Amsterdam, Netherlands, September 30–October 5, 1974.
[16] Benno, p. 22.
[17] Paul L. Laskin and Abram Chayes, "A Brief History of the Issues," in *Control of the Direct Broadcast Satellites: Values in Conflict* (Palo Alto, Calif.: Aspen Institute, 1974), pp. 3–14.
[18] *Ibid.*, p. 7.
[19] *Ibid.*, p. 8.

chapter 16

[1] Dick Stein, "Co-Op Q & A, Part I," *Radioactive*, 3 (May 1977), 16.
[2] Brenda Fox, "AM-FM Advertising Packages: Are They Legal?" *Radioactive*, 3 (April 1977), 6–7; NAB *Counsel* (September, 1977—L-711).
[3] John Coughlan, *Accounting Manual for Radio Stations* (Washington, D.C.: National Association of Broadcasters, 1975), p. 21.
[4] Author's interview with Richard A. Shaheen.
[5] These fees vary among brokers.
[6] For example, see Barry J. Dickstein, "True Station Value is Key Ingredient in Broadcast Financing," *Broadcast Management/Engineering*, (September 1976), pp. 41–42; Harold Poole, "What's Your Station's Worth," *Radioactive*, (July 1977), 16–17.
[7] For example, see Ginger Carnahan, "Logos: Your Station's Visible Voice," *Radioactive*, (January 1977), 8–9.

chapter 17

[1] From RKO Radio's "Breakthrough Course in Radio Selling," as cited in *Radioactive*, 2 (July 1976), 1.
[2] At a 95% level of confidence. Detailed discussions of sampling can be found in various statistics books. One detailed source is William L. Hays, *Statistics for the Social Sciences*, 2nd ed. (New York: Holt, Rinehart & Winston, 1973). A good general description of the sampling process is Maxwell McCombs, "Sampling Opinions and Behaviors," in *Handbook of Reporting Methods*, ed. Maxwell McCombs, Donald Lewis Shaw, and David Grey (Boston: Houghton Mifflin Company, 1976), pp. 123–38.
[3] Peter D. Fox, "Television Ratings and Cultural Programs," *Industrial Management Reivew*, 5 (Fall 1963), 37–43.

[4] John Colombotos, "Personal versus Telephone Interviews: Effect of Responses," *Public Health Reports,* 84 (September 1969), 773–82; D. A. Dillman and others, "Reducing Refusal Rates for Telephone Interviews," *Public Opinion Quarterly,* 40 (Spring 1976), 66–67; T. F. Rogers, "Interviews by Telephone and in Person: Quality of Responses and Field Performance," *Public Opinion Quarterly,* 40 (Spring 1976), 51–65. The actual questions asked in surveys also can affect the results: Bradley S. Greenberg, Brenda Dervin, and Joseph Dominick, "Do People Watch 'Television' as 'Programs'?" *Journal of Broadcasting,* 12 (Fall 1968), 367–76.

[5] *Television Ratings Revisited* (New York: Television Information Office, 1971).

[6] Many sources are useful in compiling information on interpreting the ratings. Although the formulas listed in Arbitron Publications are used as a basis for defining **some** of the terms, in no way should they be construed as directly applicable to every rating company. Like the terms themselves, the formulas are common methodology among different rating companies, although there is considerable diversity between services. The reader will want to keep this in mind. Helpful sources for this section include *A Broadcast Research Primer* (Washington, D.C.: National Association of Broadcasters, 1971); *Standard Definitions of Broadcast Research Terms* (Washington, D.C.: National Association of Broadcasters, 1973); *Probability Sampling* (Princeton, N.J.: Opinion Research Corporation, 1973); *How Arbitron Measures Radio* (Beltsville, Md.: American Research Bureau, 1974); *Description of Methodology: The Arbitron Television Market Reports* (Beltsville, Md.: American Research Bureau, 1975); *Understanding and Using Radio Audience Estimates* (Beltsville, Md.: American Research Bureau, 1976); *Arbitron Radio: Dayton, Ohio* (Beltsville, Md.: American Research Bureau, October/November 1976); William L. Hays, *Statistics for the Social Sciences,* 2nd ed. (New York: Holt Rinehart & Winston, 1973); *Nielsen Station Index: Methodology* (Northbrook, Ill.; A. C. Nielsen Co. 1973–74); *Nielsen Station Index: Demonstration Report and User's Manual* (Northbrook, Ill.; A. C. Nielsen Co., 1974–75); *Improvements in Your Arbitron Television Report* (Beltsville, Md.: American Research Bureau, 1975).

[7] *Understanding and Using Radio Audience Estimates,* p. 4.

[8] Adapted from *Ibid.,* p. 6.

[9] "Spanish-Language Net Still Battling Ratings," *Advertising Age,* February 26, 1973.

[10] "Language Problem," *Broadcasting,* 45 (April 26, 1976), 5.

[11] *Ibid.*

[12] Spanish International Network, press release, 1974.

[13] Letter from A. Howard to A. C. Nielsen Company, February 10, 1977. Given to the author by A. Howard.

[14] Neil Hickey, "The Case of the Missing Viewers," *TV Guide,* 24 (May 8, 1976), 5.

[15] Ad agencies also become concerned as reflected in "Television Viewing—an update on Hypocrisy," *Media Message* (Ogilvy & Mather, February 1, 1977).

[16] Associated Press, released to subscribers during the week of May 1, 1976.

[17] Based on listenership surveys for ABC Radio by Arbitron.

[18] Examples of joint efforts were seen in the Committee on Nationwide Television Audience Measurement (CONTAM), a joint effort of ABC, CBS, NBC, and the National Association of Broadcasters. Three well publicized studies by Martin Mayer are *How Good are Television Ratings?* 1966; *How Good are Television Ratings?* (continued . . .), 1969, and *Television Ratings Revisited,* 1969–70. In 1974, Arbitron commissioned a study which examined the reliability of the ratings: R. D. Altizer and R. R. Ridgeway Jr., *Arbitron Replication: A Study of the Reliability of Broadcast Ratings* (Beltsville, Md.: Arbitron/American Research Bureau, April 1974).

[19] Robert Edward Balon, "The Future of Broadcast Audience Measurement." Paper presented to the Southern States Communication Convention, April 1977.

chapter 18

[1] Thomas E. Coffin, "Progress to Date in Radio and Television Research." Paper presented to the 1960 conference of the American Association for Public Opinion Research.

[2] Thomas E. Coffin, "What's Been Happening to the Media Research Budget?: A Case History." Proceedings of the 1974 conference of the Advertising Research Foundation.
[3] Letter to the author from Lyn Garson of the PBS Research Office, October 31, 1977.
[4] *A Broadcast Research Primer* (Washington, D.C.: National Association of Broadcasters, 1974).
[5] Orville C. Walker, Jr. and William Rudelius, "Ascertaining Programming Needs of 'Voiceless' Community Groups," *Journal of Broadcasting*, 20 (Winter 1976), 89–99.
[6] One method would be factor analysis. R. J. Rummel, *Applied Factor Analysis* (Evanston, Ill.: Northwestern University Press, 1970).
[7] Charles E. Osgood, George J. Suci, and Percy H. Tannenbaum, *The Measurement of Meaning* (Urbana: University of Illinois Press, 1957). A related study of "image" on broadcast media is Joseph C. Philport and Robert E. Balon, "Candidate Image in a Broadcast Debate," *Journal of Broadcasting*, 19 (Spring 1975), 181–93. Two studies examining newscaster credibility are James C. McCroskey and Thomas A. Jenson, "Image of Mass Media News Sources," *Journal of Broadcasting*, 19 (Spring 1975), 169–80; D. Markham, "The Dimensions of Source Credibility of Television Newscasters," *Journal of Communication*, 18 (March 1968), 57–64.
[8] M. Wayne DeLozier, *The Marketing Communications Process* (New York: McGraw-Hill Book Company, 1976), pp. 31–32.
[9] D. Charles Whitney, "The Poll is Suspect," *The Quill*, 65 (July–August 1976), 23; G. Cleveland Wilhoit and Maxwell McCombs, "Reporting Surveys and Polls," in *Handbook of Reporting Methods*, ed. Maxwell McCombs, Donald Lewis Shaw, and David Grey (Boston: Houghton Mifflin Company, 1976), pp. 81–95; Philip Meyer, *Precision Journalism* (Bloomington: Indiana University Press, 1973).
[10] The criteria listed here are adapted from D. Charles Whitney, p. 25.
[11] Samuel L. Becker, "Reaction Profiles: Studies in Methodology," *Journal of Broadcasting*, 4 (Summer 1960), 253–68.
[12] "Tell if Speaker Is Boring," *Science News Letter*, May 24, 1952, p. 325; Elwood A. Kretsinger, "Gross Bodily Movement as an Index of Audience Interest," *Speech Monographs*, 19 (1952), 244–48.
[13] "Sweaty Palms over TV Commercials," *Broadcasting*, 44 (November 17, 1975), 48.
[14] Claude Hall, "Doomsday Machine Will Evaluate," *Billboard*, (December 24, 1974), 1, 25–28.
[15] Ralph Schoenstein, "Watching Howard Cosell for the Love of Science," *TV Guide*, 24 (February 21, 1976), 18–21.
[16] Typical of such studies and approaches are: James T. Lull, "Ethnomethods of Television Viewers," paper presented at the annual meeting of the International Communication Association, Chicago, 1978; James A. Anderson, Timothy P. Meyer, and Thomas Donohue, "Ethnography and the Sphere of Effects," paper presented to the annual meeting of the International Communication Association, Chicago, 1978; Paul J. Traudt, "Families and Television: Implications from an Ethnomethodological View," paper presented at the annual meeting of the Southern Speech Communication Association, Biloxi, Mississippi, 1979.

chapter 19

[1] Melvin De Fleur and Sandra Ball-Rokeach, *Theories of Mass Communication*, 3rd ed. (New York: David McKay Company, Inc., 1975), p. 205.
[2] A discussion of how the categories approach evolved from the bullet theory and how it fits into current communication theory is found in Wilbur Schramm and Donald Roberts, *The Process and Effects of Mass Communication* (Urbana: University of Illinois Press, 1971), pp. 4–53.
[3] Paul Lazarsfeld, Bernard Berelson, and H. Gaudet, *The Peoples' Choice* (New York: Columbia University Press, 1948).

[4] Neil Vidmar and Milton Rokeach, "Archie Bunker's Bigotry: A Study in Selective Perception and Exposure," *Journal of Communication*, 24 (Winter 1974), 43–44.
[5] Lee B. Becker, Raymond A. Martino, and Wayne M. Towers, "Media Advertising Credibility," *Journalism Quarterly*, 53 (Summer 1976), 216–22.
[6] Robert Monaghan, Joseph T. Plummer, David L. Rarick, and Dwight Williams, "Predicting Viewer Preference for New TV Program Concepts," *Journal of Broadcasting*, 18 (Spring 1974), 131–42.
[7] William Stephenson, *The Play Theory of Mass Communication* (Chicago: University of Chicago Press, 1967).
[8] David Chaney, *Processes of Mass Communication*. (London: The Macmillan Press Ltd., 1972), pp. 20–21.
[9] Deanna Campbell Robinson, "Television/Film Attitudes of Upper-Middle Class Professionals," *Journal of Broadcasting*, 19 (Spring 1975), 196.
[10] Wilbur Schramm, *Men, Messages, and Media: A Look at Human Communication* (New York: Harper & Row, Publishers, Inc., 1973).
[11] Robinson, p. 199.
[12] Neil T. Weintraub, "Some Meanings Radio Has for Teenagers," *Journal of Broadcasting*, 2 (Spring 1971), 147–52.
[13] Lawrence Wenner, "Functional Analysis of TV Viewing for Older Adults," *Journal of Broadcasting*, 20 (Winter 1976), 77–88.
[14] Herta Herzog, "What Do We Really Know about Daytime Serial Listeners," in *Radio Research, 1942–1943*, ed. Paul F. Lazarsfeld and Frank Stanton (New York: Duell, Sloan and Pearce, 1944).
[15] Joseph Foley, "A Functional Analysis of Television Viewing," (unpublished PhD. dissertation, University of Iowa, 1968), as cited in Wenner, p. 79.
[16] Characteristic of the debate is a series of articles appearing in the Winter and Fall 1975 issues of the *Journal of Broadcasting:* James A. Anderson and Timothy P. Meyer, "Functionalism and the Mass Media," *Journal of Broadcasting*, 19 (Winter 1975), 11–22; Calvin Pryluck, "Functions of Functional Analysis: Comments on Anderson-Meyer," *Journal of Broadcasting*, 19 (Fall 1975), 413–20; James A. Anderson and Timothy P. Meyer, "A Response to Pryluck," *Journal of Broadcasting*, 19 (Fall 1975), 421–23; Calvin Pryluck, "Rejoinder to Anderson-Meyer," *Journal of Broadcasting*, 19 (Fall 1975), 424–25.
[17] Bernard Cohen, *The Press, the Public, and Foreign Policy* (Princeton, N.J.: Princeton University Press, 1963), p. 13.
[18] Maxwell E. McCombs and Donald Shaw, "The Agenda Setting Function of Mass Media," *Public Opinion Quarterly*, 36 (1972), 176–87.
[19] CBS Office of Social Research, *Communicating with Children through Television* (New York: CBS, 1977).
[20] For example: Charles R. Corder-Bolz, "Television Content and Children's Social Attitudes," *Progress Report to the Office of Child Development* (Washington, D.C.: Department of Health, Education, and Welfare, 1976).
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index

C

D

E

F

G

M

O

P

Q

T

U

V

W

X

Y

Z

1935 1940 1945 1950 1955 1960

1935
Dr. Frank Stanton leaves position at The Ohio State University to join CBS's research efforts.

1938
First over-the-air ETV programming.

1939
Television is introduced at the World's Fair.

1938
Orson Welles makes famous "War of the Worlds" broadcast.

1941
Mayflower decision discourages editorializing.

1943
Edward G. Noble buys NBC Blue, becomes ABC in 1945.

1941
FCC issues *Report on Chain Broadcasting.*

1948-1953
FCC freezes television allocations.

1950
First successful recording of color television.

1948
CBS conducts the first of various "talent raids" the networks participate in during the late 1940s.

1947
Transistor is invented at Bell Laboratories.

1948
Cable systems begin in Oregon and Pennsylvania.

1945
Blue network changes name to American Broadcasting Company.

1949
Fairness Doctrine is issued.

1954
Edward R. Murrow confronts Senator Joseph McCarthy's "Red Scare" tactics on *See It Now.*

1953
KUHT signs on as first educational television station under new FCC allocations for ETV.

1956
Ampex engineers demonstrate videotape recording.

1953
ABC merges with United Paramount Theatres, Inc.

1956
United Press International launches audio service, first for a wire service.

1955
Association for Professional Broadcasting Education is founded. Later becomes Broadcast Education Association (B.E.A.)

1957
RCA demonstrates color videotape recording.

1955
Radio programming begins to specialize. Rock and roll formats develop.

1961-1968
Midwest Program for Airborne Television Instruction (MPATI).

1960
First televised Presidential debates between John F. Kennedy and Richard M. Nixon.

1961
Spanish International Network (SIN) begins operation.

1935 1940 1945 1950 1955 1960

1965 | 1970 | 1975 | 1980

1965
First Carnegie Commission for Educational Television.

1975
Beginning of increased emphasis on accountability in ETV.

More widespread use of fiber optic technology.

1969
Sesame Street begins on public television.

1980
More major corporations using television for in-house communication than there are commercial TV stations in the U.S.

AM stereo develops.

1968
ABC Radio splits into four "demographic" networks.

1979
World Administrative Radio Conference (WARC).

Increase in UHF stations and improved UHF transmission systems.

1971
National Public Radio (NPR) begins operation.

1977
Warner Communications QUBE system in use in Columbus, Ohio.

Extensive use of corporate television.

1962
Telstar relays TV pictures across the Atlantic.

1970
Public Broadcasting Service (PBS) is formed.

1979
Report of Second Carnegie Commission.

Continued discussion of Communications Act rewrite issues.

1976
Discussions begin on re-write of Communications Act.

Applications of teletext and similar distribution systems.

1973
National Black Network begins operation.

Development of direct-to-home satellite communication.

1976-1977
ABC makes significant gains in prime-time television audience ratings.

1969
Supreme Court decides *Red Lion* case.

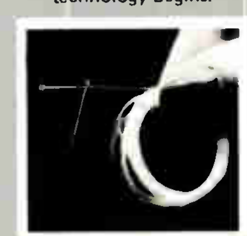
Continued penetration of FM radio.

1977
Application of fiber optic technology begins.

1967
Corporation for Public Broadcasting (CPB) is formed.

Increased accountability in educational broadcasting.

1962
Communications Satellite Act of 1962.



Continued growth of two-way cable services.

1968
CBS introduces video casettes.

Increased deregulation of radio.

1968-1975
Major corporations introduce television for in-house corporate communications.

Networks increase specialized programming and develop distribution systems to regional audiences.

1976
INTELSAT V satellite construction begins.

1967
Public Broadcasting Act of 1967.

Emergence of regulatory issues affecting superstations.

1975-1977
NBC launches short-lived all-news radio network.

Development of cable networks.

1963
Television pre-empts regular programming for three days to cover the aftermath of the assassination of President Kennedy.

1974
Associated Press starts audio service.

Growth of Pay cable and Pay TV.

1979
Major re-write proposal is killed in committee.

1974
Public Broadcasting Service begins Station Program Cooperative.

Expansion of business and industrial television networks for corporate communication.

1965 | 1970 | 1975 | 1980

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