

STAY TUNED

A CONCISE HISTORY
OF AMERICAN
BROADCASTING

STERLING



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A CONCISE HISTORY
OF AMERICAN
BROADCASTING

**Christopher H.
Sterling**

*The George Washington
University*

**John M.
Kittross**

*Temple
University*

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*to our parents—who were there
and thus listened to many things
we missed*

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Rebecca Hayden

Production Editor

Rebecca Hayden

Designer

Dare Porter

Copy Editor

Jean Schuyler

Technical Illustrator

Axya Art

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We think that the history of broadcasting is important.

The ambiguous mirrors of radio and television, reflecting the world about us and projecting our interests and concerns upon themselves, are a major part of all our lives. In fact, most of us spend more time listening to and watching radio and television in an average week than doing anything else except perhaps sleeping.

But we feel, in addition, that any institution—such as broadcasting—must recognize its roots and learn from its history in order to compete with other institutions and to grow in a constantly changing environment. Even though the past never exactly repeats itself, our knowledge of it will shape our future course.

Our goal is to tell how American broadcasting got where it is today and, by analyzing principles, events, and trends, suggest what directions it may take in the future. We emphasize trends rather than incidents and trivia, key individuals rather than random examples, and basic principles rather than isolated facts. Instead of just listing events, we try to explain them, interrelating developments in technology, organization and structure of the industry, economics, news and entertainment programming, audience research, and public policy and regulation.

We have arranged our material both chronologically and topically. The chapters are built around well-defined, consecutive periods of broadcasting's development. The topical arrangement of sections within chapters is consistent throughout the book except for the first two chapters. Tables of contents for both approaches are provided.

Within each chapter describing an era, we start with technology—the conditions, inventions, and innovations of that period relating to broadcasting. Man-made laws are more easily changed than are natural

Preface

“. . . it might be advantageous to 'shout' the message, spreading it broadcast to receivers in all directions, and for which the wireless system is well adapted, seeing that it is so inexpensive and so easily and rapidly installed—such as for army manoeuvres, for reporting races and other sporting events, and, generally, for all important matters . . .”—J. J. Fahie, *A History of Wireless Telegraphy* (1901), p. 259

“In 1928 we were watching it grow.”

“And in 1950 the radio art will have influenced this whole people for more than thirty years, breaking down their distance barriers, making all the world their neighbor, carrying the electric word from coast to coast and nation to nation . . . promoting understanding, sympathy, peace . . .

“It will have played its part in the development of music . . . in education, and in business, and in happiness . . .”—Paul Schubert, *The Electric Word* (1928), p. 311

laws governing the electromagnetic spectrum. Allocations of spectrum space trigger political attention because broadcasting is important to the public. Allocations of time and money are important to other technologically based media and industries. Technological innovation involves economic antecedents and consequences, from the acquisition and control of patents, the unwillingness to discard investment in obsolescent studio equipment and receivers, to the entire range of relationships between government, industry, and the public, as the financial stakes grow over the years. These relationships are often far more important than the individual inventors, innovators, or electronic devices they develop.

Within each chapter beyond the earliest, we then discuss the basic unit of broadcasting—the individual station, originally thought of as the outlet for local expression and regulated by Congress accordingly.

Stations soon found it more profitable to establish affiliation with a national network, helping create the power of nationwide broadcasting organizations, to which we turn our attention in the third section of most chapters. We see the changing cast of haves and have-nots among stations and networks constantly jockeying for position and often creating or coloring important trends in the not-so-monolithic broadcasting industry.

In the fourth section of chapter 3 and later chapters, we examine the checkered development of educational, later public, broadcasting and the often precarious fortunes of noncommercial broadcasters, supported by donations, schools, government, and, more recently, corporate underwriting.

However, radio and television in the United States has become overwhelmingly commercial in respect to overall investment, audience interest, or nearly any other

criterion. By the late 1920s advertising agencies had assumed a dominant position in network programming policy-making, a position they held for nearly three decades. Also discussed in the fifth section of most chapters are the changing roles of different media as new broadcast advertising competitors arrived on the scene.

Certainly listeners value broadcasting almost exclusively for its programming. In the sixth part of all but the first two chapters we review the development of program types, the apparent cycles of their invention-imitation-decline over the years, and the borrowing by one medium of another's content. We explore reasons for television's rapid development of program diversity compared to radio; we see why entertainment programming has been most popular while specific news broadcasts are often most memorable. Broadcast programming helps us maintain our surveillance of the world, to integrate what we see and hear, and transmits our culture—whether we like it or not—from person to person, country to country, and generation to generation. At the same time, its entertainment is a counterbalance to the stresses of our increasingly complex society.

One cannot discuss programming without looking at the audiences, of which we are all a part. The seventh part of chapters 3 through 10 covers various aspects of the audience for radio and television—how it evolved, its reflection in the development and sale of receivers, ways of measuring its size, needs, and desires, and the effects that broadcasting is believed to have on people.

Because the radio spectrum is considered to be a national natural resource, it is administered by the federal government. We devote the eighth section to the roles of the legislative, judicial, and executive branches of government as well as to that creature with characteristics of all three, the Federal

Communications Commission and its predecessors. Communications policy in this country is an intricate combination of politics, economics, technology, and sometimes logic, formed in a crucible of opposing public and private interests. Because the regulatory policies and judicial doctrines form slowly, many problems in broadcasting continue without apparent solution for years or even decades.

Finally, each chapter ends with a very brief account of the parallel events in broadcasting elsewhere in the world, and notes some relationships of American radio and television to other social expressions of the period, such as wars, fads, the Depression, and Watergate.

Within this topical structure, we follow not only trends and continuing problems but the contributions of individual persons. Problems often return in other guises with other casts of characters. Personnel changes create policy changes in or among networks, stations, advertisers, the FCC, Congress, and citizen groups that can affect the entire institution of broadcasting. In reviewing the lives of radio and television's pioneers, we are reminded that broadcasting has been a part of American life for little more than a lifetime.

The authors of this book are, quite frankly, fascinated with the subject of broadcasting. We have tried to share our enthusiasm and show why broadcasting history is interesting as well as important. Our method lacks some of the trappings of serious historiography (footnotes) but does include a detailed glossary in unusual format, a lengthy bibliography of sources for further reading, supplementary tables, a chronology, and an index. In *Stay Tuned* we have tried to note the important events and themes in American broadcasting's story through careful selection of items to include in this single volume and subjects to analyze at length.

To find what we included, we suggest that you pay particular attention to the two tables of contents (chronological and topical), skim through the appendixes to get a sense of their contents, and then dig in where the book seems most relevant or interesting. No matter where you start or how you use the book, we hope you will obtain a better understanding of how broadcasting became the industry/art/baby sitter/hero/villain/advertising medium/entertainer/news communicator and everything else it is today.

In the research, writing, and editing of this volume, we have had the help of many people. Among those who deserve our warmest thanks are (alphabetically): Joseph E. Baudino, of the Westinghouse Broadcasting Company and the Broadcast Pioneers, for his unparalleled knowledge of radio's early days; Joseph Berman, of Ohio University, for helpful criticism and encouragement; Gordon Greb, of San Jose State University, for his expert knowledge of early radio pioneer "Doc" Herrold; Kenneth Harwood, Dean of Temple University's School of Communications and Theater; the ever patient Becky Hayden, of Wadsworth, who more than any other person is responsible for keeping us going for half a decade and hence for many of the strengths of this book; Temple colleague Sydney Head for his page-by-page criticism; Cathie Heinz and her staff at the Broadcast Pioneers Library in Washington; the *Journal of Broadcasting's* many contributors during the long years when one or the other of us was editing it (1960–1976); collector of broadcast data *par excellence* Lawrence W. Lichty; consummate manuscript editor Jean Schuyler, who overcame the turgid prose of early drafts; Elliot Sivovitch of the Smithsonian's division of electricity and nuclear energy, who set us straight on many occasions; Robert R. Smith of Boston University, who offered

valuable and constructive criticism at several stages of the book's gestation; Dallas W. Smythe of Simon Fraser University, who showed how to look behind the scenes; and Nathan B. Stubblefield, for obvious reasons.

We also owe gratitude to our many sources, among which are the books listed in the bibliography, many that aren't so listed, several different libraries, countless secondhand bookshops, various Temple University departmental chairmen—one a former Iowa radio station manager and network operations supervisor, the second a former Philadelphia weekend television anchorman, and the third the son-in-law of radio's *The Whistler*—who ignored the mounting quantity of xerography requisitions, and many others.

As with most such volumes, our families gave far beyond the call of duty, without even the inner spur of scholarship or the outer spur of academic politics, and we hope that this recognition of the Sterling (Ellen, Jennifer, and Robin), and Kittross (Sally, David, Julie, and Serendipity) clans will be an aid to them during the transition of becoming reacquainted with husbands and fathers.

And, of course, for several years we have had each other to fight with, leading us to adopt the cheerful injunction in Backstrom and Hursh's *Survey Research* that "the authors will attribute any errors to each other."

C.H.S. & J.M.K.

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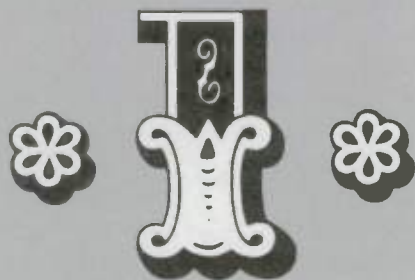
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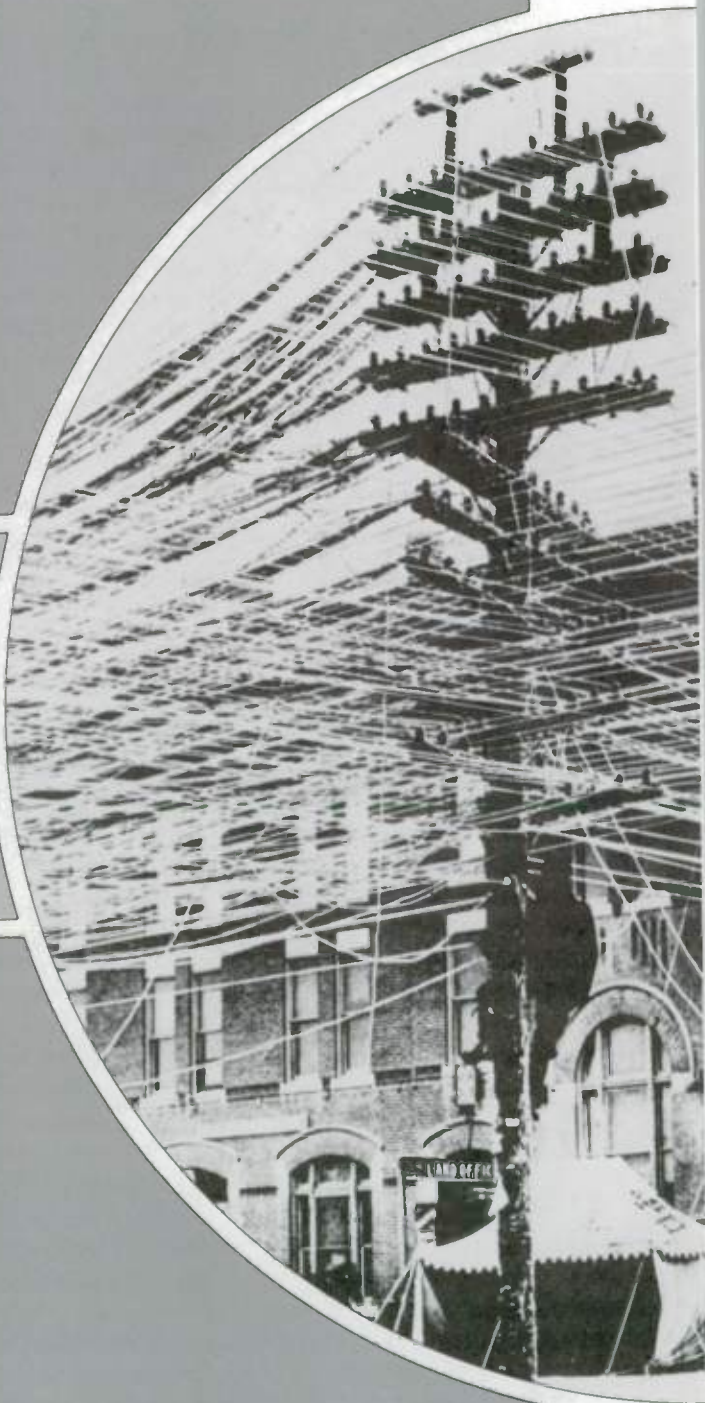
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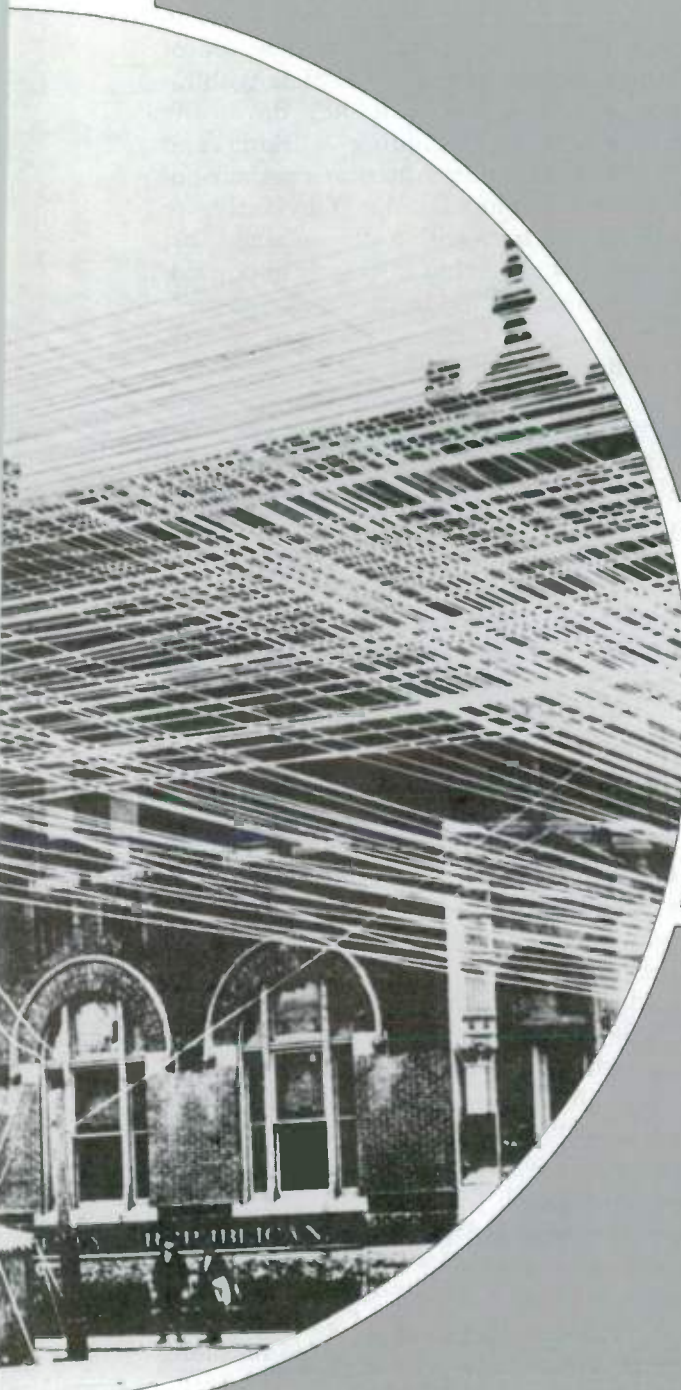
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The Context
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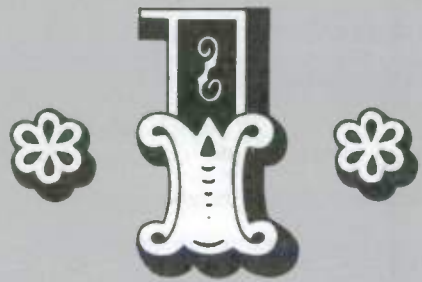


"What Hath God Wrought?"—first
official words over the initial (1844)
American telegraph line





The Context
of
Broadcasting



"My God, it talks!"—attributed to the Emperor of Brazil, Dom Pedro, on first hearing the telephone at the 1876 Centennial Exhibition in Philadelphia

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Radio broadcasting is still so young that its history can fall into one person's lifetime, and television is much younger. Most Americans may spend more time with radio and television than they do at any other activity, including working and sleeping, and most Americans get most of their news from television. Obviously, we are dealing here with a phenomenon that is not only recent but extremely important, one whose cultural impact is almost inestimable. Why, then, do we know so little about its development?

Unfortunately, most early broadcasters and inventors were too busy creating an industry, and surviving in what they had created, to think of recording its development for those who followed. Now the time is growing short to capture this history from those who lived it. At the same time, more and more pragmatic reasons for knowing it are cropping up, and more people are becoming interested in it.

For example, regulation of space communications satellites follows principles established in international agreements in 1906, and even some from 1865. The American Telephone and Telegraph Company's decisions to avoid unrestrained competition in 1926 and 1976 are wholly consistent with their decisions of the 1880s to stay out of that hurly-burly. Early television programming of the late 1940s and early 1950s resembles the development of radio programming in the 1920s and 1930s. The beginnings of both cable television and pay-TV are discernible in a telephonic system in Budapest nearly 100 years ago that distributed music and information for a fee. Videodisc recording is a descendant of Baird's television experimentation in England during the 1920s. As early as 1945, Arthur C. Clarke wrote a full description of space communications satellites.

In addition to basic principles, cur-

rent problems have their roots in the past. For instance, placing the international distress ("SOS") frequency at 500 kHz in 1912 led some years later to placing standard (AM) broadcasting on a portion of the spectrum utterly unsuited to competitive local broadcasting. Television has been affected by earlier spectrum decisions: New Jersey's 1970s fight for a VHF channel is really an attempt to overturn a 1945 political decision by the FCC that is a cornerstone of the United States television system. The currently controversial Fairness Doctrine stems from specific statutory language in 1959, a 1949 FCC policy decision, a 1941 licensing case, the "public interest, convenience and necessity" language in the Communications Act of 1934, and interstate commerce regulation right back to the Constitution in 1789. Indeed, there is hardly an argument on any aspect of modern broadcasting that does not leave one with a feeling of having heard all this before!

1•1 The Concept of Mass Communication

The concept of *mass communication* that distinguishes radio and television broadcasting from the telephone or even closed-circuit television refers to the effort to share information or entertainment with varied and probably large numbers of people through a technological intermediary. We can trace this concept along the path of direct human communication all the way from primitive spoken language and cave drawing to the telegraph and telephone, and we can follow the development of modern mass communication from the introduction of print five hundred years ago to the increasingly elaborate technologies of the motion picture, radio, and television.

When one imparts ideas and information "to whom it may concern" through some mechanical or electromechanical means, usually rapidly, over considerable distance, to a large and essentially undifferentiated audience, and when there are many copies of the message (duplicates of a newspaper or individual television sets tuned in)—then we have *mass communication*.

A *mass medium* is (1) the means—a printing press or a radio transmitter—by which the communicator produces and distributes copies of the message to the mass audience or (2) the industry that operates the means. A *mass audience*, usually large but sometimes only a handful, consists of people who typically are associated only by their attention to the same message. The distance between the medium and the audience can usually be measured in miles, but a newspaper restricted to a campus is still a mass medium. The audience may be highly specialized rather than undifferentiated—an abstruse scientific journal may reach only specialists in that field. Although Letters to the Editor and call-in programs on radio involve some person-to-person communication, they can still be considered mass communication to the rest of the audience. Circulation or coverage may be small. Unit cost to the consumer, typically low, may be high, as it was with early-day television. Messages usually are transmitted and received at or about the same time—but many books are timeless in appeal.

1•2 Early Communication

Mass communication began when a cave dweller first shouted a warning to all the tribe within earshot or, closer to modern methods, used a technological device such as a horn, bells, a hollow-tree

drum, a signal fire, a flag of cloth or wood, or a piece of reflecting metal to maintain surveillance of his or her surroundings and improve his or her chances of survival. Slowly people became capable of using more complex ways to transmit their culture to the next generation. The realistic paintings of animals and animal hunts on cave walls probably served as hunting lessons for younger members of the tribe, and possibly also as religious symbols intended to ensure good fortune on future hunts. In this way the tribe could refresh their memories and build on the lessons already learned without each generation having to start all over again.

Slowly, over thousands of years, pictures of people, places, animals, and things became conventionalized and stylized into symbols. Although the mass of the people still learned through oral tradition or storytelling, small ruling classes and religious elites developed a system of pictographs and hieroglyphics—the printed, stamped, inscribed, painted, or carved “word.” Written language was a code that only a tiny fraction of society could understand.

Communication typically depended upon human senses and abilities. When *speed* was uppermost—a prearranged code of signal fires carried news of the fall of Troy across most of Greece in a single night—the *amount* of information transmitted had to be small. Sending a long or complicated message took a longer time—as with the Romans’ semaphore and flashing light devices—and sometimes involved a human carrier using whatever means of travel was available, whether it was a horseman using a Roman road or a Royal Incan messenger using a high-speed foot trail in the Andes.

After the fall of Rome in the fourth century A.D., the Roman Catholic church preserved much of the knowledge of the

past in its monasteries. By painstakingly reproducing books by hand, the monks managed to preserve some of the culture of the past that was not being transmitted by word of mouth among the illiterate masses.

The first real change in mass communication came with the introduction of the printing press and movable type. People in the Far East learned to construct wood block and then tin letters and form a page that would print many copies. The first use of movable type—whereby separate wood or metal letters could be temporarily combined into desired words—in the Western world is ascribed to Johann Gutenberg of Mainz, Germany, who either developed his own press, type, and ink, or applied the Eastern system in 1456. The new process soon spread across Europe and reached Mexico in 1539, although its use was sometimes held up by the Church, which objected strongly both to losing its monopoly of recorded communications and to the increase of secular publishing that the Renaissance had stimulated.

Although tremendously faster than hand copying, printing was restricted to the relatively slow speeds of hand-operated presses until the 1800s, when larger, motor-driven presses became practical and common. Low-cost printing made books available to many more people, was a stimulus to literacy, standardized the appearance of alphabets, and enhanced the idea of the utility of books, reducing their artistic and increasing their social importance.

1.3 The Rise of Mass Society

Significant changes were taking place in Western society in Gutenberg’s day. A new class of traders and merchants, between the rich and the poor,

kept themselves informed of foreign developments in technology, commerce, and politics. Reformation within the Catholic church and revolt from without brought new patterns of societal control to Europe. The spread of secular news and knowledge brought a loosening of religious control over everyday life. In addition, the long-lasting feudal system began to give way to parliamentary government as the population, spear-headed by the growing merchant middle class, began to question the spending practices of monarchs.

At the same time, a renaissance of learning and art was taking place. Starting in southern Europe, the fine arts flourished, science and technology advanced, knowledge was acquired from the East, and new ideas once again became acceptable. Versatile men appeared, like Leonardo da Vinci, who could work in medicine, science, military technology, art, and music. Sometimes the noble families, who still held most of the money, and consequently power, acted as patrons of a *high culture* of artists, musicians, architects, and some scientists—all of whom produced their work for this small elite or for the church.

In many civilizations, millions of common people who provided the economic base for high culture had their own thematically and technically simple *folk culture* from which the high culture often borrowed. Folk culture of the Middle Ages took the form of fairs, circuses, traveling minstrels, song and story sessions, and morality plays, providing some religious instruction and a great deal of diverting entertainment.

In the 1700s the Industrial Revolution spread from England to the continent. Machines, driven by water and steam instead of human and animal power, supplied an increasing amount of manufactured goods that the home couldn't

produce, at prices that individual craftsmen couldn't match. By the 1800s, manpower needs of industry, expansion of international commerce, and the start of mechanized agriculture led people toward city living.

The growing cities furnished an industrial base, great amounts of information and people who wanted it, and a market for mass-produced entertainment and information. The density of population made distribution easy. The local tavern continued to serve as a center of communications as it had for hundreds of years, but information now came as posted broadside advertisements or printed newspapers in addition to the traditional word of mouth from travelers. This situation was analogous to the "first color TV set in town" in the local bar or the cluster of men around the transistor radio in the Arabian coffee house.

Although literacy was increasing, thanks to the rise of public and private schooling toward the end of the nineteenth century, improvements in transportation and technology were more important to communication in the increasingly urbanized society. Steam power permitted the mechanization of printing presses, made transportation by water faster and more reliable, and allowed the railroad (supplemented by improved carriage and wagon roads) to knit all parts of a country together. Greater occupational specialization, particularly in cities, led to an increased use of money instead of barter and to an increased need for news and entertainment—mass communication.

And, most important, in the nineteenth century the first electrical communication devices (the telegraph and then the telephone) decisively overcame the problem of speed without dependence upon unaided senses or transportation. By

the mid-1800s, both the socioeconomic systems of the more developed countries and their emerging technologies were ready for invention and later introduction of the components of the mass electronic media we know today: radio and television broadcasting.

1•4 Early Electrical Communication

For centuries the technological development of communication revolved around distance, speed, number of copies, and quantity of content. Each new technology was a balance of these demands. The Pony Express could deliver mail faster than any other method, but it could carry only a few pounds at a time. If many copies of a communication were required, or if each copy contained many pages, production might take much more time and space than for a limited output.

While the development of print media answered the fundamental question of quantity, it did so at the expense of speed—the time needed for gathering information, setting it in type, and printing, binding, and distributing newspapers, magazines, or books. Improving routes and methods of transportation shortened distances, but the speed with which news could travel still was limited by how fast man, animal, train, or ship could go.

Combining distance with speed became possible with development of telegraph systems. The first of these was the mechanical semaphore originated by the Romans and forgotten during the Middle Ages. Rediscovered, the semaphore systems of several European countries reached a high degree of efficiency in the late 1700s. Semaphores were fast and simple for *short* messages, but the equipment was expensive to build and operate, and many towers would be needed to relay signals over

long distances. Their inefficiency for long messages and their high personnel costs limited use to the most urgent needs. Although lights could be used at night, the semaphore was essentially a daytime, good-weather system that, like all telegraphs, achieved point-to-point rather than broadcast communication.

1•41 *The Electrical Telegraph*

However useful the semaphore was, it was quickly rendered obsolete by invention of the electrical telegraph. Electricity could travel through a wire at almost the speed of light, and it could surmount fog or bad weather. Wherever a wire could be strung, there the electrical telegraph could go; nor did operators have to be within sight of each other. All that was needed was a source of electricity, a switch or key to manipulate the current, a wire to conduct electricity, and a mechanism—the element inventors changed most frequently—to “read” the transmitted message visually or audibly.

In the United States, the first practical telegraph was invented by Samuel Finley Breese Morse, then well-known as an artist. In 1832 he learned from a fellow passenger on board ship returning from Europe about the electromagnet and work being done on electrical signaling for railways in England. Morse worked on electrical telegraphy over much of the next three years. His first instrument, in 1835, used pulses of current to deflect an electromagnet, which moved a marker to produce a written code on a strip of paper. A year later he modified the device to emboss the paper with dots and dashes. These were elements in what is now called “Morse code,” even though it probably was actually developed by Morse’s financial partner Alfred Vail. This code was

carefully constructed, in keeping with what we now call Information Theory, with the most common letter, *e*, coded in the easiest form, one dot. With such a code, the inventor needed only one wire circuit to send sequentially even the longest messages. Some earlier devices had needed a separate wire circuit for each letter of the alphabet!

In 1840, Morse secured a patent on the system and set out to obtain financial backing for a demonstration. His ultimate source of funds, as with so many later inventions, was the United States government. In 1843 Congress appropriated \$30,000, and Morse used the money to construct a demonstration line that spanned the 40 miles between Washington and Baltimore. First he had to solve many technological problems—particularly those involving insulating the wires so that the electricity wouldn't leak into the ground—as is often the case when scaling up from a laboratory model. The official first message, "What hath God wrought," was sent May 24, 1844.

In 1847 Congress sold the demonstration line to Morse interests, and the United States opted out of governmental control of telecommunications for the time being. Morse soon found that it was extremely hard to defend his patent because the technology was so simple. As a result, more than 50 telegraph companies were operating by 1851, and many more followed. But the number of important companies shrank steadily after the creation of the Western Union Telegraph Company in 1856, as uneconomical duplications and poorly engineered lines led to mergers and absorptions. By the early 1900s only Western Union and Postal Telegraph remained strong—and, at the start of World War II, after Congress passed a special antitrust law exemption, Western Union took over Postal Telegraph.

The telegraph was so efficient that it quickly eliminated competing forms of communication, such as the Pony Express, which died as soon as the first transcontinental telegraph line opened in 1861. While the telegraph naturally had important wartime applications, major emphasis in the United States was on commercial development. In the late 1840s five New York newspapers organized the Associated Press to get pooled telegraphic reports of the Mexican War. In England, Julius Reuter, who began a "pigeon post" in the 1850s to provide market prices to businessmen, adopted telegraphy and expanded his reports into a general news service for newspapers.

In Europe, development of land telegraphy followed a different path. Governments retained controlling interest in telegraphy and subsequent means of telecommunication. They placed military and political uses first and often postponed commercial telegraphy for years. Some countries continued to use the old optical telegraph and semaphore systems, which had been so fully developed, until the late 1850s.

The telegraph and the railroads intertwined to spearhead the economic development of the United States. The telegraph needed a right-of-way between centers of population while the railroads needed some means of dispatching trains; both needed agents or operators. Their problems were solved by combining the jobs of station agent and telegraph operator in one person who handled railroad service messages and public messages alike. This system almost doubled the freight-handling capacity of the railroad and substantially reduced the cost of maintaining telegraph operators. As the number of competing railroad companies declined, mostly through merger and purchase, so did the number of potential tel-

egraph lines running between the same pairs of cities.

1•42 *Submarine Cables*

Although the telegraph could deliver a message almost instantaneously, in transmission its capability stopped at the ocean's edge. The first underwater cable, laid in 1850 across the English Channel, lasted only a short time, since its wire bundles were highly susceptible to damage from fishermen, dragging anchors, and corrosion and short-circuiting by sea water. In 1858, after several short cables had been installed successfully, wealthy American businessman Cyrus W. Field organized the first of several transatlantic cable layings. The first, between England and the United States, lasted about six months and was unreliable. In 1866, Field and his associates laid a new cable from Ireland to Newfoundland that worked. Although the transmission speed was only six words a minute, the success of this transatlantic cable inspired installation of cables between other continents, and spurred commercial and diplomatic communication.

Although pairs of nations had previously reached bilateral agreements, by 1865 there was enough general need and basis for agreement on operational techniques and finances for an International Telegraph Convention to meet in Paris. The convention agreed on priority of messages (governmental, then telegraph administration, and then commercial or private), uniformity of rates (set by distance), methods for settling accounts between countries, and meetings scheduled to update regulations. This gathering was the genesis of the International Telegraph Union—now the International Telecommunication Union (ITU), a world organization under the United Nations that

allocates radio spectrum space and sets standards for international telegraph and telephone.

1•43 *The Telephone*

The electrical telegraph had several drawbacks: it could transmit only a few words per minute, it required trained operators, it conveyed emotion or emphasis poorly, it required a new alphabet (Morse code), and it was one-way. If the human voice could be transmitted in a two-way system, all of these problems would be overcome.

On February 14, 1876, Alexander Graham Bell, a successful teacher of the deaf, filed for a patent on such a device. He demonstrated his invention at the Philadelphia Centennial Exhibition of 1876 and attracted considerable attention. The first telephone system, with 21 subscribers, was established two years later in New Haven, Connecticut. Although Bell benefited financially from his invention, his financial backer and father-in-law Gardner Hubbard, and his excellent business manager Theodore Vail, a distant cousin of Morse's backer, had control.

After an unsuccessful attempt to sell the invention outright for \$100,000 to Western Union in 1877, Bell and his associates redoubled their efforts to fight patent infringements and conflicts, purchase improvements on the telephone, and put systems into the most populated portions of city after city. Competition came from numerous small companies, many with a cavalier attitude toward the patent system, and from Western Union. This immensely wealthy and powerful company, realizing its earlier mistake, had set out to establish a rival telephone company based on other patents.

However, when financial baron Jay

Gould threatened to establish a rival telegraph company in association with Bell's company in an effort to depress Western Union's stock and then buy it cheaply, Western Union hurriedly made peace with the Bell interests in 1879, giving up all ideas about competing in the telephone field in exchange for the Bell interests staying out of the telegraph industry. By 1909 the Bell system was so successful that the American Telephone and Telegraph Company (as it had been named in 1885) was able to purchase Western Union—only to have to resell it in 1914 because of the antitrust laws.

In the first ten years of the telephone, AT&T made some of the corporate decisions that guide it to this day. Since it could expect rival companies to appear in 1894 when Bell's basic patents expired, AT&T decided to initiate research to improve the telephone in small but patentable steps, to purchase successive developments by independent inventors—such as Michael Pupin's loading coil, which made long-distance telephony practical—and to concentrate on a part of the industry that only one company could feasibly operate—long-distance communication. While an estimated six thousand firms battled in the late 1890s for local telephone business, AT&T worked to create transcontinental telephone service, which they accomplished in 1915. Until stopped by a threatened antitrust action just before World War I, AT&T also bought many competing local firms. Today it controls about 85 percent of the nation's phones—and virtually all the long-distance business.

This philosophy is still evident. AT&T has made large concessions to the antitrust laws—relinquishing royalties in 1956 on all patents, including the transistor—in order to keep control of its manufacturing subsidiary, Western Electric. Local operating companies typically

belong to AT&T, except for some token shares, and generally buy their equipment from Western Electric. There are enough other telephone companies to keep AT&T reasonably safe from the antitrust laws, although a new Justice Department suit was begun in 1975. But in the contiguous United States, only one firm provides long-distance service, and the Long Lines Division is an inseparable part of AT&T. AT&T also searched for a "natural monopoly" in broadcasting. During the 1920s, when it could not maintain a monopoly of commercial "radio telephony for hire" or "toll broadcasting," it sold its stations to competitors; in the 1950s when it no longer sold the lion's share of certain transmitters and speech-input equipment, AT&T dropped that business completely. While it still supplies all interconnecting lines for the broadcasting networks, domestic communications satellites, generally competing with AT&T, were expected to come into increasing use in the late 1970s.

Although most European countries placed telephone operations, like the telegraph, within a government department, usually the postal service, in the United States private ownership of the telephone was challenged only once. This occurred during World War I, when the federal government took over telephone, telegraph, and railroad companies to assure the priority of military operations and war production during a time of communication and transportation shortages. Some earlier proposals for government ownership of electrical communication, notably by Postmaster General Burlison in 1914 and an earlier postmaster general in 1872, got nowhere. The actual wartime takeover did not hamper the operations of the Bell System, however, since all details and virtually all policy were left to Bell executives, who inaugurated federal policies, including installation service charges,

that state regulatory agencies previously had blocked. After the war, although the navy still wished to control wireless, AT&T easily retrieved its facilities.

1•44 *The Electrical Manufacturing Industry*

The successful development of telegraph and telephone in the United States led to near-monopolies by Western Union (telegraph) and AT&T (telephone). At the same time, as electricity was used more after 1880, companies appeared that manufactured electric lights, electric motors, and the like. The most important electrical manufacturing firms were Westinghouse, started in 1886, which brought the alternating current power system to the United States, and General Electric, formed in 1892 as an amalgamation of two older firms, including Thomas Edison's. After several years of competition and patent arguments, GE and Westinghouse agreed in 1896 that GE should receive two-thirds of the business growing from their shared patents. This early patent "pool" agreement was an important precedent for the radio manufacturing industry. Another important firm was Western Electric, which specialized in telephone communications equipment and was taken over by AT&T in 1881.

All these firms were interrelated, not necessarily through ownership but because the manufacturing companies provided equipment and services to the communications organizations while the latter, fed by increasing public use of their facilities, provided a demand on the electrical manufacturing companies. Each one was so wrapped up in its own business that research was limited to perfecting the products that were already selling and little time, personnel, or money was

spent on new systems such as wireless—which will be discussed fully in chapter 2.

1•5 **Broadcasting: A New Mass Communication Medium**

Radio *broadcasting* was a new electrical communications concept. Telegraph, telephone, and early radio were only faster means of point-to-point or interpersonal communication. It took time to overcome this mental barrier that made any other course seem unknowable. History tells us that nothing could beat the speed of the royal Incan messengers, until the horse was introduced to the Western Hemisphere. Similarly, the Pony Express lasted 16 months, until the transcontinental telegraph was completed. The limits of the telegraph—its low words-per-minute capacity and need for trained operators—were "impassable," until the innovation of the telephone permitted rapid two-way conversation by distant laymen. Radio removed our dependence on wires, and finally "broadcasting" presented a new concept, just as movable type had when it bypassed the barrier—slow production of copies—of hand-lettering, and made widespread literacy worthwhile. Americans living when radio was new felt that it was a miracle—a cheap and pervasive national mass medium.

Although radio seemed to spring full-blown upon America in the early 1920s, amateur operators had been transmitting and listening to speech and music since 1906. After commercial broadcasting started in 1922 and networks were fully established in 1926, everyone agreed that radio was truly a mass medium: a few programming sources (networks) geared to reach as large an undifferentiated audience as possible, for the purpose of purveying goods and services through advertise-

ments. Even when, in the late 1950s and in the 1960s, radio networks virtually disappeared, and radio became a local medium serving specialized groups while television took over the national business, radio remained a mass medium.

But just what is *broadcasting*? It clearly has a different method of delivery from the other media of mass communication—and often a different message to deliver. According to Section 3(o) of the Communications Act of 1934, broadcasting is “the dissemination of radio communications intended to be received by the public, directly or by means of intermediary relay stations.” The three essential elements here are “radio communication” (meaning use of wireless electromagnetic radiation—see Appendix B); “intended for” (meaning that everyone “whom it may concern or interest” is welcome to listen in, distinguishing a broadcast from the private interchange of telephone, telegraph, postal service, or even Citizens Band [CB] radio); and “the public” (laymen, who may merely be curious). Although *broadcasting* and *broadcasting station* (radio and television) are discussed in 3.21, we should establish here that broadcasting signifies transmission of music, speech, and/or pictures in forms that the general public can understand, on a regular and announced schedule, on a frequency band for which the general public has receivers, by a station licensed by the government for that purpose (if licensing was then required).

Broadcasting is an industry, an institution, and a process, and we intend to examine all three. The system of broadcasting in the United States is virtually unique in the world (not necessarily better; simply different), and this book explores how the system is unique, how it got that way, and why.

As recently as 25 years ago, for example, the number of radio stations

supposedly was limited by “technology” (the more stations, the more interference), or, more likely, by economics (only networks could finance expensive programming, by spreading costs over many stations), and politics (rural areas need clear-channel stations, and rural areas elect more than their share of legislators). We ignored the technological barriers—who cares about long-distance interference if the audience lives within a score of miles of the transmitter? The economic “necessity” of networks disappeared with the development of less expensive but still effective local program formats. The political “imperatives” of radio allocation shifted significantly as a result of “one man, one vote” Supreme Court decisions.

Television might some day travel the same road—but it also might follow a different path. Videotape recorders, color, and portable television sets are already part of the industry. The barriers that still face television are the speed of light, the ranges over which our senses operate, and the number of hours in the day. But can these be any more impassable than the walls that used to hamper older forms of communication? For instance, although propagation speeds may be limited, research indicates that “compression” of the television picture and sound is possible without loss of comprehension; a form of “fast motion.” All of the strictly-entertainment media might be replaced in an Orwellian future by direct electrical stimulation of the brain, rather than by the slower and more imperfect use of sensory inputs. Telepathy is now a science-fiction concept, as were television and the atomic bomb; but we all know how many hours of subjective time our minds can cover in a few seconds of dreaming. More likely, but still in the science-fiction category, is the possibility of completely random access to nearly unlimited amounts of television

programming through the use of computer scheduling, multiplexed additional channels (wired or broadcast), multiple-pickup playback video recorders in the stations, and inexpensive home VTRs.

The limits we live with are in our own minds. By learning how previous limits were breached, perhaps we can look more wisely at the problems of today, such as the Fairness Doctrine, lack of channels, access, automation, cable television, pay-TV, and advertising and programming standards. In order to affect the future wisely, we *must* become aware of past principles, trends, decisions, and events.

New ways of applying or modifying old solutions may change the ground rules of broadcasting as completely as the vacuum tube supplanted the old rotary-generator transmitters or the iconoscope removed the mechanical limitations of the television scanning disc. It may take time—3-D color TV was first shown in 1926—but technology, structure, function, and regulation will adapt when and if the will, desire, and imagination are ready for another chapter in the unfinished story of broadcasting.

Further Reading

For overall views of the development of popular culture and communication, two useful studies are Hogben (1949), which traces graphic communication from the Stone Age, and Nye (1970), which deals with American culture, especially its written form (novels, poetry). An even broader historical perspective of communication and culture is found in the popular encyclopedic approach of Barry (1965). A solid, scholarly history of American book publishing, newspapers, and magazines is Tebbel (1975), which also touches later broadcasting but not film. It is the first

thorough attempt to interrelate the three media in a single historical treatment.

The newspaper and magazine press is dealt with in two standard journalism histories, Emery (1972) and Mott (1962), both of which relate American events that affected, and were affected by, the press. Mott (1952) is dated, but remains one of the best histories of America's news in all its formats but particularly the newspaper.

The rise and role of the news agencies is the focus of several useful studies. One of the earliest, Rosewater (1930), remains the best scholarly analysis. The first century of the British agency, Reuters, is told in Storey (1951), while Gramling (1940) provides a popular narrative of Associated Press, concentrating on reporting specific stories, and showing the contribution of the telegraph and telephone. Morris (1957) does a comparable job for the United Press. Finally, Cooper (1942) is a news agency head's story of how the American agencies broke into the world news agency cartel.

For an excellent historical bibliography of electrical communication, see Shiers (1972). The best integrative histories of telegraph-telephone-cables and wireless are Harlow (1936), and, from legal and economic viewpoints, Herring and Gross (1936). More detail of varied patent fights and claims in early telegraph and telephone is in both Marland (1964), and the King monograph (1962). A popular, up-to-date overview of history and current technology is Brown (1970)—perhaps the best starting place for the novice.

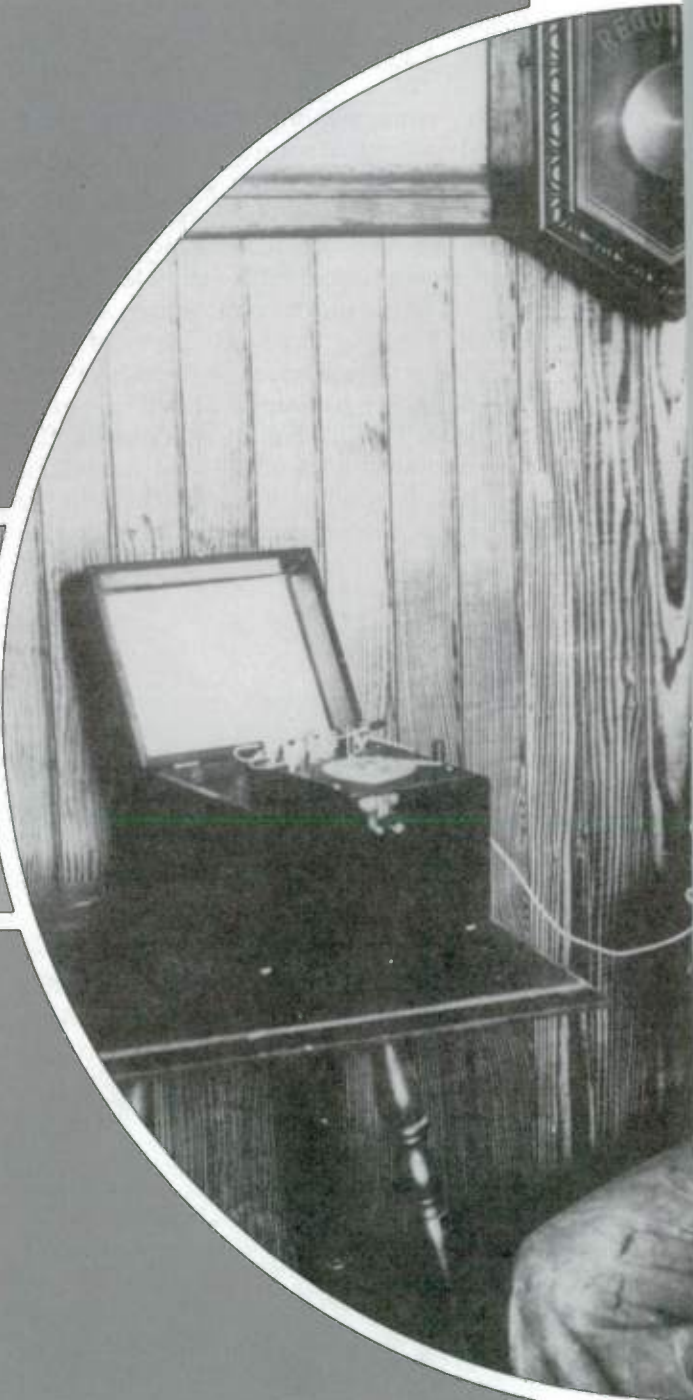
The definitive discussion of pre-electric telegraph (or semaphore) systems is found in Wilson (1976). For an overall history of the telegraph, see Fahie (1884). The best biographies of Morse are Prime (1875) and Mabee (1943). The most detailed analyses of various American tele-


graph companies and the people that ran them are in Reid (1879) and Thompson (1946). A popular short history of the first century of submarine cables is Clarke (1975), while a more technical discussion based on original sources is Dibner (1964). Cyrus Field is discussed in many books, but the most recent biography is Carter (1968). The most detailed history and technical description of cable technology up to the end of the nineteenth century is Bright (1898). The best technical history of early telephone development is Rhodes (1929). The definitive biography of Bell to date is by Bruce (1973). For discussions of the growth and role of AT&T, see Danielian, the FCC telephone report (both 1939), or the more recent analysis (which is also more favorable to AT&T) in Brooks (1976).

The Prehistory
of
Broadcasting
(to 1919)



"... Signor Marconi gave a practical demonstration which showed that even in its present state the instruments can be made useful in signaling between ships and shore, and there is a certainty of working under all conditions of weather which is not common to any other mode of communication at sea."—Lt. G. W. Denfield, U.S. Navy, in report to Secretary of the Navy, 1899





The Prehistory
of
Broadcasting
(to 1919)



“... a company incorporated for \$2,000,000, whose only assets were de Forest’s patents chiefly directed to a strange device like an incandescent lamp which he called an Audion and which device had proven worthless.”
—government prosecutor in 1912 mail fraud stock case

Outline:**The Prehistory of Broadcasting (to 1919)**

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This chapter describes the many technological problems that slowed broadcasting's development and relates the fundamental wireless discoveries and their initial applications. Although thirty years passed between the first theorizing about wireless in 1865 and Marconi's first practical system experiments, our concern is mostly with the subsequent rise of wireless communication from an isolated invention to a widespread, practical innovation. Even as it was already in use, researchers in many nations who were working to perfect wireless saw it only as a point-to-point medium that could straddle natural barriers and operate more cheaply than the wire telegraph or telephone. Few then thought that the absence of privacy protection from listeners-in would one day become one of radio's strongest advantages.

As radio's military and commercial values became obvious after 1895, major countries tried to develop their own systems so as not to have to depend upon others in emergencies. This competition increased the importance of patents, for by controlling essential patents one country or firm could dominate broadcasting's development for years. The many different systems that succeeded have subtle and complicated distinctions, but in this chapter we concentrate more on the impact and application of wireless, or radio, than on its technical intricacies. Other technical material is in the glossary (Appendix B), to which readers (of this chapter in particular) should refer.

2•1 Fundamental Wireless Discoveries

As with many other nineteenth-century inventions, radio developed in widely separated places when the conditions were right. Also typical of that pe-

riod was the importance of the individual inventor or innovator who—unlike the twentieth-century research team working in industrial laboratories—borrowed one element, added another, and was frequently ignorant of work done elsewhere. The invention or innovation (an invention introduced commercially as a new or improved product or process) was often the result of luck or curiosity rather than systematic scientific research applied to a specific problem.

In retrospect, wireless, or radio, is a logical extension of wired telegraphy and telephony. Wires were physical in nature, easily broken, and hard to string between distant communities or over physical obstacles. With wireless techniques, communication could take place as rapidly as with wired devices but did not require a physical connection. Distant locations could be contacted quickly; relaying might be unnecessary; and ships could keep in touch with land. The penalty for this was that a radio message would go out in all directions at once and could be picked up by anyone who cared to listen. A wired circuit, on the other hand, was relatively private and would normally reach the desired party.

2•11 *Conduction and Induction*

There are three important kinds of electrical transmission: conduction, induction, and radiation. *Conduction* means the sending of impulses through a medium capable of transmitting electricity—a wire, salt water, the earth. *Induction* refers to the appearance of a current in one circuit when it is placed near another, already charged circuit, without a physical connection. Induction can cause cross talk on a telephone circuit, and induction coils permit the recording of telephone conversations without wire hookups. *Radiation* means the

generation of electromagnetic waves, generally from an antenna. The radio transmissions of today use this last method, which became practical just before 1900.

A Spaniard, Salvá, proposed using sea water as a conductor in 1795, 50 years before the first practical wired electrical telegraph system was built. In 1838 Carl August Steinheil, a Munich physics professor, proposed using railway rails as conductors and then experimented with the bare earth, sending messages for 50 feet. Morse, after constructing his wired system, suggested using water to extend land lines. Some of his assistants succeeded in receiving water-borne electrical signals over a distance of two miles.

Many other experimenters contributed to our knowledge of transmitting electricity. One of the most resourceful was Mahlon Loomis, a Washington, D.C., dentist who succeeded in 1866 in sending signals between mountains nearly 20 miles apart in Virginia. In 1872 Loomis received the first patent for wireless in America and the next year persuaded Congress to grant his company a federal charter. However, the financial panic of 1872 dried up potential sources of investment, and the Chicago fire of 1871 helped bankrupt some of his backers. Although no commercial system using the Loomis technique was successful, as late as 1924 the U.S. Signal Corps still recommended as a “field expedient” receiver his remarkably simple apparatus involving kite-flown aerials with a galvanometer in series with the aerial and ground. Another early experimenter, William Henry Ward of Auburn, New York, patented a “telegraphic tower”—looking remarkably like the early commercial space satellite communications receiving station at Andover, Maine—in 1872, which reportedly could send signals to many receiving antennas if all were “connected to the earth.”

Flow Chart on Invention of Radio and Television / This chart traces the development of radio and television and shows how broadcasting was the result of experimentation and research by many scientists and inventors. The chart was drawn by Max Gschwind for Fortune Magazine (December 1954) and is reproduced here by permission.

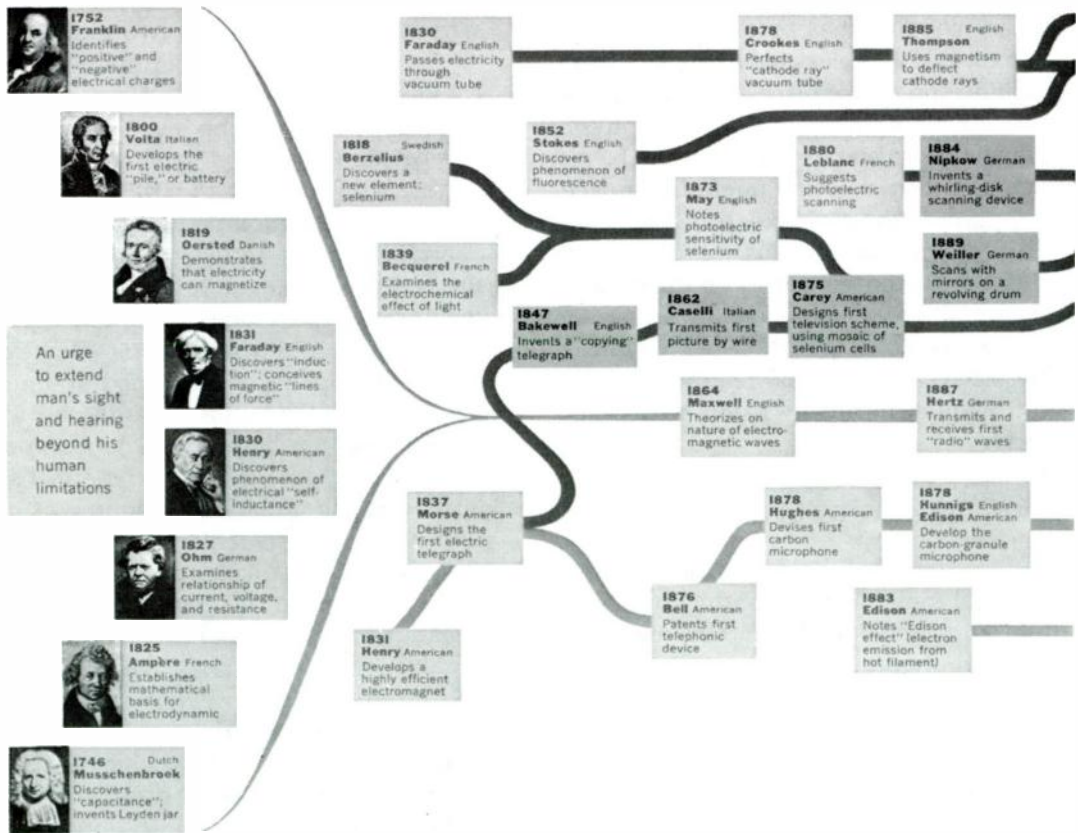
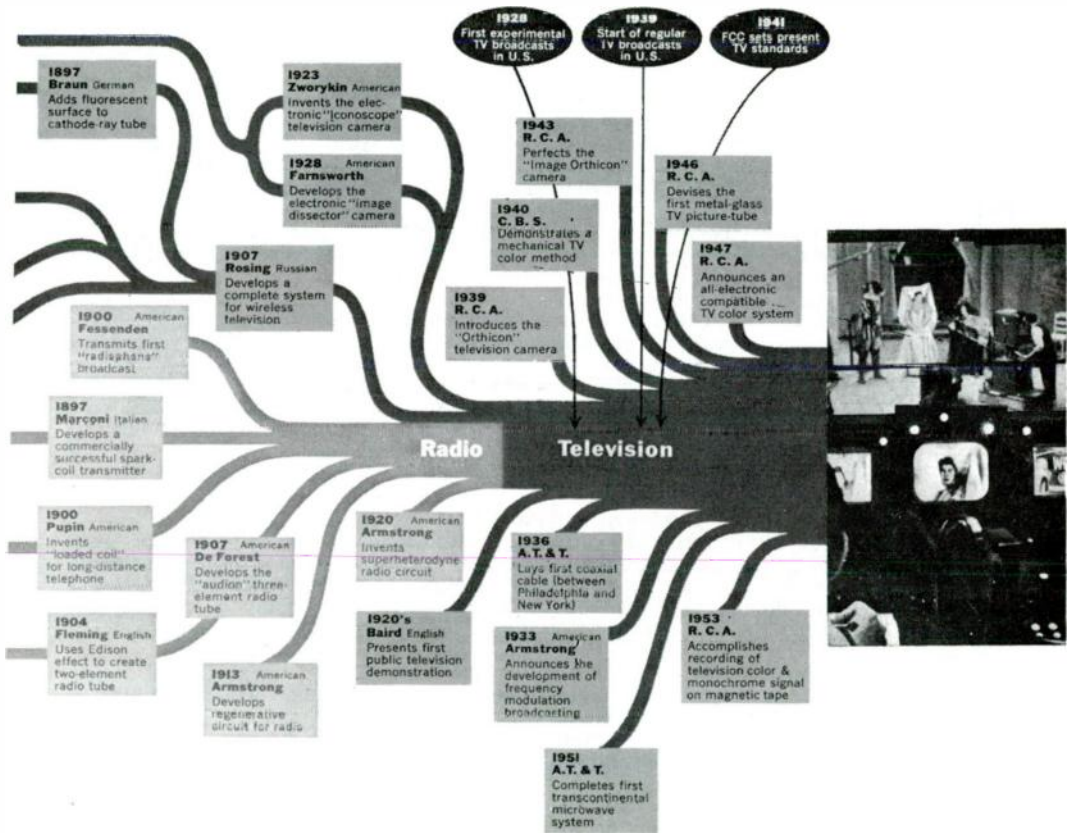


Photo credits: Volta, Oersted, Henry, Ampère (Culver Service); Faraday (Associated Press); Ohm (Brown Brothers); Musschenbroek (from *Grote Nederlanders* by Dr. G. C. Gerrits, E. J. Brill, Leiden, 1948); photo on right page (Andreas Feininger-Life).



Two Early American Radio Inventors / Reproduced from the patent records are the Loomis patent of 1872 (see 2.11), the first wireless patent granted in the United States, and a diagram from a 1908 patent of Nathan Stubblefield showing how his system would work near a waterway (other diagrams applied to railroads and roadways).

UNITED STATES PATENT OFFICE.

MAHLON LOOMIS, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN TELEGRAPHING.

Specification forming part of Letters Patent No. 129,971, dated July 30, 1872.

To all whom it may concern:

Be it known that I, MAHLON LOOMIS, dentist, of Washington, District of Columbia, have invented or discovered a new and Improved Mode of Telegraphing and of Generating Light, Heat, and Motive-Power; and I do hereby declare that the following is a full description thereof.

The nature of my invention or discovery consists, in general terms, of utilizing natural electricity and establishing an electrical current or circuit for telegraphic and other purposes without the aid of wires, artificial batteries, or cables to form such electrical circuit, and yet communicate from one continent of the globe to another.

To enable others skilled in electrical science to make use of my discovery, I will proceed to describe the arrangements and mode of operation.

As in dispensing with the double wire, (which was first used in telegraphing,) and making use of but one, substituting the earth instead of a wire to form one-half the circuit, so I now dispense with both wires, using the earth as one-half the circuit and the continuous electrical element far above the earth's surface for the other part of the circuit. I also dispense with all artificial batteries, but use the free electricity of the atmosphere, co-operating with that of the earth, to supply the electrical dynamic force or current for telegraphing and for other useful purposes, such as light, heat, and motive power.

As atmospheric electricity is found more and more abundant when moisture, clouds, heated currents of air, and other dissipating influences are left below and a greater altitude attained, my plan is to seek as high an elevation as practicable on the tops of high mountains, and thus penetrate or establish electrical connection

with the atmospheric stratum or ocean overlying local disturbances. Upon these mountaintops I erect suitable towers and apparatus to attract the electricity, or, in other words, to disturb the electrical equilibrium, and thus obtain a current of electricity, or shocks or pulsations, which traverse or disturb the positive electrical body of the atmosphere above and between two given points by communicating it to the negative electrical body in the earth below, to form the electrical circuit.

I deem it expedient to use an insulated wire or conductor as forming a part of the local apparatus and for conducting the electricity down to the foot of the mountain, or as far away as may be convenient for a telegraph-office, or to utilize it for other purposes.

I do not claim any new key-board nor any new alphabet or signals; I do not claim any new register or recording instrument; but

What I claim as my invention or discovery, and desire to secure by Letters Patent, is—

The utilization of natural electricity from elevated points by connecting the opposite polarity of the celestial and terrestrial bodies of electricity at different points by suitable conductors, and, for telegraphic purposes, relying upon the disturbance produced in the two electro-opposite bodies (of the earth and atmosphere) by an interruption of the continuity of one of the conductors from the electrical body being indicated upon its opposite or corresponding terminus, and thus producing a circuit or communication between the two without an artificial battery or the further use of wires or cables to connect the co-operating stations.

MAHLON LOOMIS.

Witnesses:

BOYD ELIOT,
C. C. WILSON.

No. 887,357.

PATENTED MAY 12, 1908.

N. B. STUBBLEFIELD.
WIRELESS TELEPHONE.
APPLICATION FILED APR. 5, 1907.

3 SHEETS—SHEET 1.

Fig. 1.

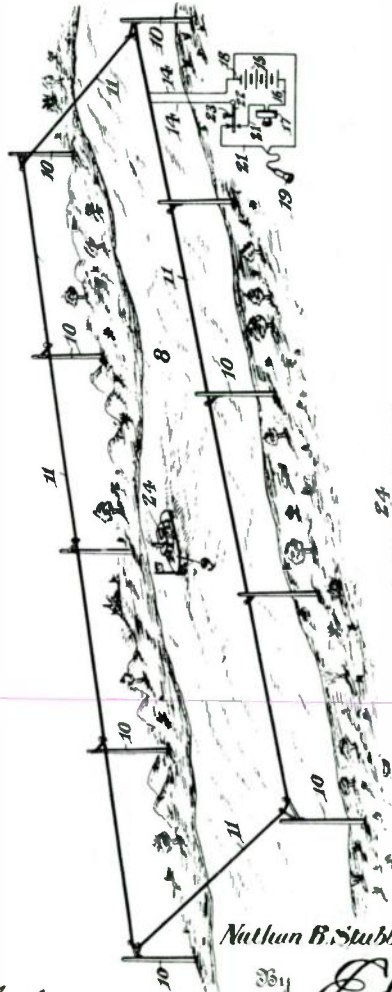
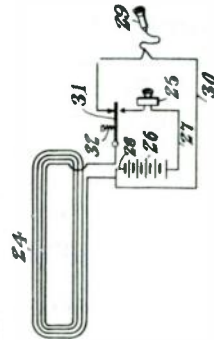


Fig. 3.



Fig. 2.



Witnesses
José McLaughlin
R. H. Jones

Nathan B. Stubblefield, Inventor

By *E. J. Higgins*
 Attorney

Most early experimenters believed in the concept of "ether" or "aether" as a medium (thought to be part of the atmosphere, hence "airwaves") that existed specifically to transmit electrical impulses. They thought that if they could successfully tap it and insert an impulse, the ether would carry the impulse for great distances. The idea of the ether, defined later as "that which carries radio waves," apparently served as mental crutch, because it hung on in physics and radio engineering literature until the end of the 1930s.

In the early 1870s, Elihu Thompson and Thomas A. Edison individually began to detect sparks created by generators some distance from the measurement point. Edison in 1885 took out his only patent in wireless for an induction system that used antennas to get above the earth's curvature and its conduction. A year later, Professor Amos Dolbear of Tufts College in Massachusetts took out a patent for his "electrostatic telephone," a system of telephonic (voice) induction communication using a tin roof or a wire hanging from a kite to induce current into the "ether." Some energy may have been radiated from his antenna as well, but Dolbear had no good means of detecting the weaker radiated waves, even though they could reach a greater distance. A contemporary Harvard physicist, John Trowbridge, proposed inductive methods to reach ships at sea.

Another American inventor who attempted commercial application of his discoveries was Nathan B. Stubblefield of Kentucky. Having read about recent electrical radiation experiments in popular science magazines, he started experimenting with a system in the late 1880s. In 1892 he demonstrated ground conduction voice signals over several hundred yards. Later, although possibly never realizing the three distinct types of transmission, he switched

to induction and communicated from the shore to ship stations on lakes or rivers. Stubblefield was particularly interested in communicating to and from moving vehicles over relatively short distances. Like Loomis, he got caught in a commercial scheme that, in this case, was in the nationwide-publicity and funding stage before Stubblefield pulled out, claiming that his business partners were making crooked deals using him as a scapegoat and cheating him. Although he was a prolific inventor, even patenting the tin-cans-connected-by-string telephone, Stubblefield eventually died of starvation.

It is not surprising that commercial attempts at harnessing both induction and nonmetallic earth and water conduction failed. There were variations in conductivity, losses caused by the signal going in all directions at once, and limits to the amount of power that a sending coil of reasonable size could hold. So far, induction and nonmetallic conduction could not hope to compete with the wire telegraph and telephone except possibly for short distances to moving vessels or vehicles. Researchers also had difficulty in demonstrating reliability of their signals, or even any results at all. Typically, they used galvanometers to register that a signal had been sent or received, but these meters could easily confuse interpreters, react to other electrical impulses, like lightning flashes, or fail to register adequately the minute amounts of current transmitted. Furthermore, a radiation component in many of the inductive experiments may have accounted for much of whatever success they had.

2• 12 *Radiation*

The development of radiation for wireless communication rested upon a firm theoretical framework. The major findings

of a Scottish mathematician and physicist James Clerk Maxwell, published in 1864, suggested that a signal could be sent out electromagnetically that would be completely detached from the point of origin. Using mathematical equations, he demonstrated that electricity, light, and heat are essentially the same and that all radiate at the same speed in free space.

German physicist Heinrich Hertz demonstrated the correctness of Clerk Maxwell's theories in a series of experiments in 1887–1888. The fundamental unit of frequency, the Hertz (Hz), is named for him. Hertz measured the speed of electromagnetic radiation—the speed of light—the length of various waves, and similar parameters but did not promote the use of wireless for communication. His crude but reasonably effective detector of radiated waves was a device that allowed an electric spark to jump a small gap between two charged steel balls when the receiving coil was placed facing a nearby transmitting spark coil. Hertz never achieved much range, and this device was superseded by the much more efficient invention of French physicist Édouard Branly, in the early 1890s. His *coherer* consisted of a glass tube filled with metal filings that cohered or packed together and permitted an electrical current to pass whenever a wireless signal was being received. Although the coherer permitted reception of very weak radiated currents, it had to be tapped mechanically after each pulse in order to restore the filings to their prereception looseness. In the late 1890s, English physicist and author Sir Oliver Lodge worked out the principle of resonance *tuning* so that both receiver and transmitter would operate on the same wavelength or frequency without dissipating the signal over a broad portion of the spectrum.

In addition to Hertz, Branly, and Lodge, we find numerous persons whose

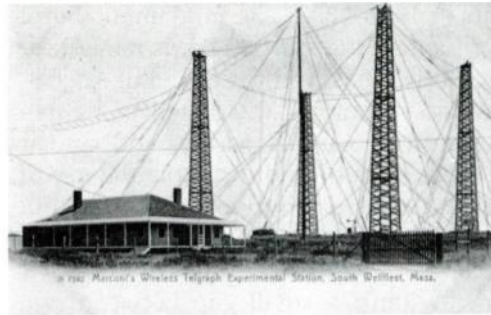
work, while not universally recognized, either led or could have led to a practical wireless system. Among the most prominent was Alexander Popoff. This Russian professor at the University of Kronstadt developed a better coherer and vertical antenna around 1895 and noted the connection between Hertzian waves and static, but he was intent upon developing a detection-prediction system for thunderstorms rather than a system of communication. (An analogous system for the purpose of detecting tornados by their *noise signature* on television channel 2 was tested in the United States in the early 1970s.) Popoff, whom the Soviet Union considers the inventor of radio, worked extensively in wireless and made equipment for the Russian navy.

2•121 *Marconi* The most widely known inventor-innovator in the field of wireless, the man most historians credit with inventing radiotelegraphy, is the Italian Guglielmo Marconi. Marconi was interested in making radio work and only secondarily in *how* it worked. In 1894, age twenty, he read of Hertz's experiments and aimed to apply this knowledge to communication. Supported by a wealthy father, Marconi was able during the next year to improve the Hertz transmitter, to note that a signal sent from an elevated antenna would go farther, to use a ground connection as well as an antenna, to make the Branly-Lodge coherer more sensitive, and to add a telegraph key and batteries. By 1896 he could transmit and receive two miles or more on his father's estate near Bologna.

It was obvious to his family that the young man would shortly have developed a commercially valuable, wireless telegraphy system. After the Italian government expressed no interest, the family decided to send him to England, which,

Marconi and the Transatlantic "S": 1901 / Winds, as much as or more than distance, nearly undid Marconi's hopes of sending a wireless signal across the Atlantic Ocean late in 1901. First, a gale nearly wrecked the large Poldhu station in Cornwall. Then, just two months later, a similar storm demolished the new Marconi station on Cape Cod, threatening a long postponement of the tests. Then, with the Poldhu apparatus jury-rigged, Marconi and his assistants sailed for Newfoundland, which was somewhat closer, in the dead of winter. Marconi described what happened in a speech given a year later:

The first experiments were carried out in Newfoundland last December, and every assistance and encouragement was given me by the Newfoundland Government. As it was impossible at that time of the year to set up a permanent installation with poles, I carried out experiments with receivers joined to a vertical wire about 400 ft. long, elevated by a kite. This gave a very great deal of trouble, as in consequence of the variations of the wind constant variations in the electrical capacity of the wire were caused. My assistants in Cornwall had received instructions to send a succession of "S's," followed by a short message at a certain pre-arranged speed, every ten minutes, alternating with five minutes' rest during certain hours every day. Owing to the constant variations in the capacity of the aerial wire it was soon found out that an ordinary syntonic receiver was not suitable, although a number of doubtful signals were at one time recorded. I, therefore, tried various microphonic self-restoring coherers placed in the secondary circuit of a transformer, the signals being read on a telephone. With several of these coherers, signals were distinctly and accurately received, and only at the pre-arranged times, in many cases a succession of "S's," being heard distinctly although, probably in consequence of the weakness of the signals and the unreliability of the detector, no ac-



tual message could be deciphered. The coherers which gave the signals were one containing loose carbon filings, another, designed by myself, containing a mixture of carbon dust and cobalt filings, and thirdly, the "Italian Navy Coherer," containing a globule of mercury between two plugs. . . .

The result of these tests was sufficient to convince myself and my assistants that, with permanent stations at both sides of the Atlantic, and by the employment of a little more power, messages could be sent across the ocean with the same facility as across much shorter distances.

Source: G. Marconi, "The Progress of Electric Space Telegraphy," delivered Friday, June 13, 1902, before the Royal Institution, London. Reprinted in Eric Eastwood (ed.) *Wireless Telegraphy* (New York: John Wiley, 1974), pages 72–88, at page 86. Courtesy of Applied Science Publishers Ltd., England.

as the most important maritime power with its empire and control of most of the world's cables, was the country most concerned with development of long-range communication. At age twenty-two, Marconi arrived in London. His Irish-born mother's contacts carried him to the head of the telegraph system of the British Post Office, William Preece, who had done some wireless experimentation himself. Preece took the young Italian under his wing and helped him to improve his system and show it to important persons in British finance and government.

Marconi's work progressed rapidly. Soon, his signals reached eight miles or more; in 1899 he spanned the English Channel, and two years later he transmitted the letter S in Morse code across the Atlantic to Newfoundland. However, opposing telegraph interests invoking their monopoly franchise forced Marconi to dismantle his Newfoundland station. Then, incorporating Lodge's tuning principle into his apparatus, Marconi achieved a standard of reliability that overcame the skepticism his "miraculous" invention had provoked. Actually, Marconi may not have invented anything, as Hertz or others had, but he assembled the fruits of many lines of development into a working apparatus.

Marconi managed to attract excellent business and technical managers and advisers, who put together the first wireless firm that could cultivate a profitable market. His company, formed in 1897, was first called the Wireless Telegraph and Signal Company but was changed in 1900 to Marconi's Wireless Telegraph Co., Ltd., or simply "British Marconi." Together with an American subsidiary formed two years later, it quickly became dominant in both marine and transatlantic communication, remaining so until after World War I. Marconi, although something of a showman, was primarily interested in experimen-

tion, winning the Nobel Prize for physics in 1909, and let his well-qualified advisers and staff run the business. The companies concentrated on commercial applications of wireless telegraphy, as well as the British Empire's world-wide communications needs. Although the Marconi companies had some difficulty persuading land-line telegraph companies and government administrations to relay messages from wireless receiving stations to their final destinations, the marine business was profitable—at lower rates than the telegraph cable—as early as 1910.

2•122 *Fessenden* The first major experimenter in the United States to work with wireless was Reginald A. Fessenden, a Canadian with far less business acumen than Marconi and a temper that repeatedly alienated his backers. He became a professor of electrical engineering at the University of Pittsburgh after having worked for Edison and with the U.S. Weather Bureau on a system of wireless transmission of forecasts. He wanted to develop a workable system of transoceanic wireless using continuous waves rather than Marconi's spark gap technique. Fessenden believed that this method would provide the power necessary to obtain more effective Morse code transmissions and simultaneously create the quieter carrier wave required for voice transmission.

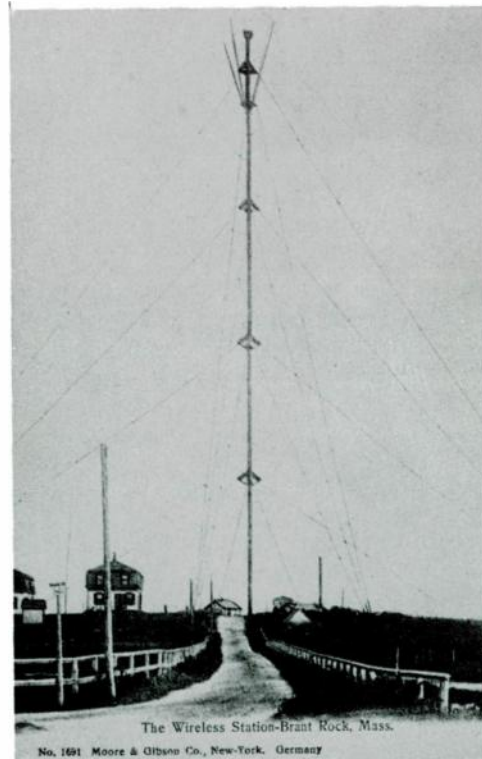
In 1900, Fessenden asked GE to make him a high-speed generator of alternating currents, or alternator, to use as a transmitter. The electrical manufacturing firms accepted special orders for machinery from communications inventors and organizations, and this was the first major request for wireless apparatus. The customer received the essential equipment and service, and the manufacturing company kept the business, profit, and ideas.

It took three years for GE to design

and deliver the first alternator to Fessenden, who worked for a full decade with GE engineers. One of these, E. F. W. Alexander, later perfected the alternator for GE, working along different lines from Fessenden. To fund his experimentation, Fessenden found financial backing to form the National Electric Signaling Company in 1902. When the financial panic of 1907 wiped out an opportunity to sell the company to AT&T, Fessenden founded a company in which his original backers had no part. This led to lengthy law suits between backers and inventor and the eventual sale of assets—primarily patents—to Westinghouse after World War I. This firm failed chiefly because of the backers' lack of technical knowledge and understanding and the inventor's difficult personality.

Fessenden continued to contribute important technological developments for many years. He is most remembered for transmitting probably the first publicly announced broadcast of radio telephony, from his station at Brant Rock, Massachusetts, on Christmas Eve 1906. Following a private demonstration a month before, Fessenden alerted ships up and down the East Coast of the United States by wireless telegraphy and arranged for newspaper reporters to listen in in New York to the Christmas Eve broadcast, followed by one on New Year's Eve. If one considers the "general public" of the day as those few who owned and used receiving equipment, mainly ships at sea, and the newspapers as representatives of the public, then the 1906 transmissions were the first

Site of the World's First Voice and Music Broadcast: 1906 / This is a postcard view of Fessenden's Brant Rock station, showing the tall tubular tower with its adjustable antenna at the top, and the two summer cottages that were converted into living quarters and station headquarters. The tower was demolished in 1912 or 1913. This particular card was mailed in July of 1907, just six months after the Christmas Eve broadcast discussed in the text—and bears the handwritten comment on the back "Did you get my wireless?"



The Wireless Station-Brant Rock, Mass.

No. 1691 Moore & Gibson Co., New-York. Germany

broadcasts. They were scheduled, they were for the general public, and listening required no special knowledge of code since they consisted of voice and music. The publicity they received included apocryphal stories of shipboard radio operators hearing angels' voices. However, since Fessenden's purpose was to make money from his inventions of long- and medium-range radio apparatus, he meant these broadcasts as publicity and not as a program service to the public.

2•123 de Forest Another very important American inventor-innovator of radio was Lee de Forest. After earning a Ph.D. from Yale in 1899 with a dissertation on wireless telegraphy, de Forest worked briefly for Western Electric. In 1900–1901 he developed his own wireless telegraphy system as competition for Marconi, who was then getting established. De Forest's system was a technical failure but a publicity bonanza. He had arranged to wireless the results of a 1901 yacht race from a boat to one of the smaller press associations, but a Marconi set on another boat created such interference that neither signal could get through. The newspaper publicity about the attempt, however, reached stock promoter Abraham White, who decided to back de Forest.

The De Forest Wireless Telephone Company was established in 1902, with de Forest concentrating on research and White promoting heavy sales of stock. Customers included the army, the navy, and the United Fruit Company, which needed radio to communicate with its plantations in Central America, but sales were limited compared to stock sold and expectations engendered. As a result, in what was to become a common tale, the backers dissolved the company in 1907 and sold its assets to the United Wireless Telegraph

Company, in an effort to remove the inventor from any benefits.

Fortunately de Forest retained the rights to his most important invention, the Audion or triode vacuum tube (see 2.22), and immediately set up his own firm, the De Forest Radio Telephone Company. During the next few years, de Forest accomplished some spectacular publicity events: in 1907 he offered occasional telephonic, classical music broadcasts; in the summer of 1908, he broadcast a long phonograph record concert from the Eiffel Tower, with reception reported 500 miles away, although it was more reliable at 25 miles; in 1910 he broadcast Enrico Caruso in two operas from the Metropolitan Opera House in New York to perhaps fifty people. Financial problems, law suits, and criminal stock fraud charges forced de Forest to sell some of the Audion rights to an undisclosed agent of AT&T at a low price. Even so, the de Forest company went bankrupt in 1911, the first of his several business catastrophes. Clearly, de Forest was a better inventor than he was businessman or scientist, and his reputation as the "father of radio" is based largely and deservedly on the Audion, which played a key role in electronics for several decades.

2•2 Improvements in Wireless

With basic wireless principles known, attention turned—over the next several years—to perfecting both transmission and reception of radio signals.

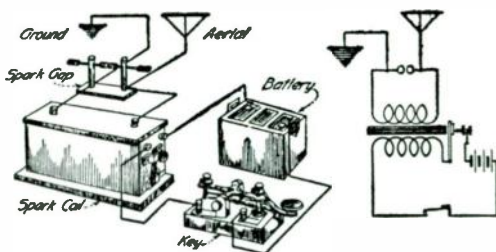
2•21 *Transmission*

Marconi's early experiments and initial commercial installations used the spark gap transmission pioneered by Heinrich Hertz in the 1880s. Although

simple to construct, the spark gap transmitter required a large amount of power, radiated energy over a broad band, was bulky, and produced a thunderous and disagreeable crash. Furthermore, it was either "on" or "off," and it could not be modulated for speech and music.

An early improvement on the spark gap transmitter was the *arc*. Danish inventor Valdemar Poulsen patented an arc generator in 1902 that, by using a much narrower gap, could give a nearly continuous series of sparks, or arc. Because this system, called *CW* or *continuous wave*, was inherently more efficient for communication than was the spark gap, it could be used over longer distances. The Poulsen

Typical Early Wireless Transmitter / Taken from a typical book of the time intended for radio experimenters, this is both a drawing and an electrical schematic of a spark-gap transmitter—the standard wireless transmitter from the time of Hertz in the 1880s to the time of World War I. That it was used for wireless telegraphy (code) and not telephony (voice and music) is evident by the telegraph key—the spark jumping the gap made far too much noise for successful voice transmission. Working with a battery, the system was self-contained, thus not requiring plug-in sources of current. The receiving end might consist of a coherer (in the earliest days), and after 1900 a crystal detector as is shown in the box on page 80.



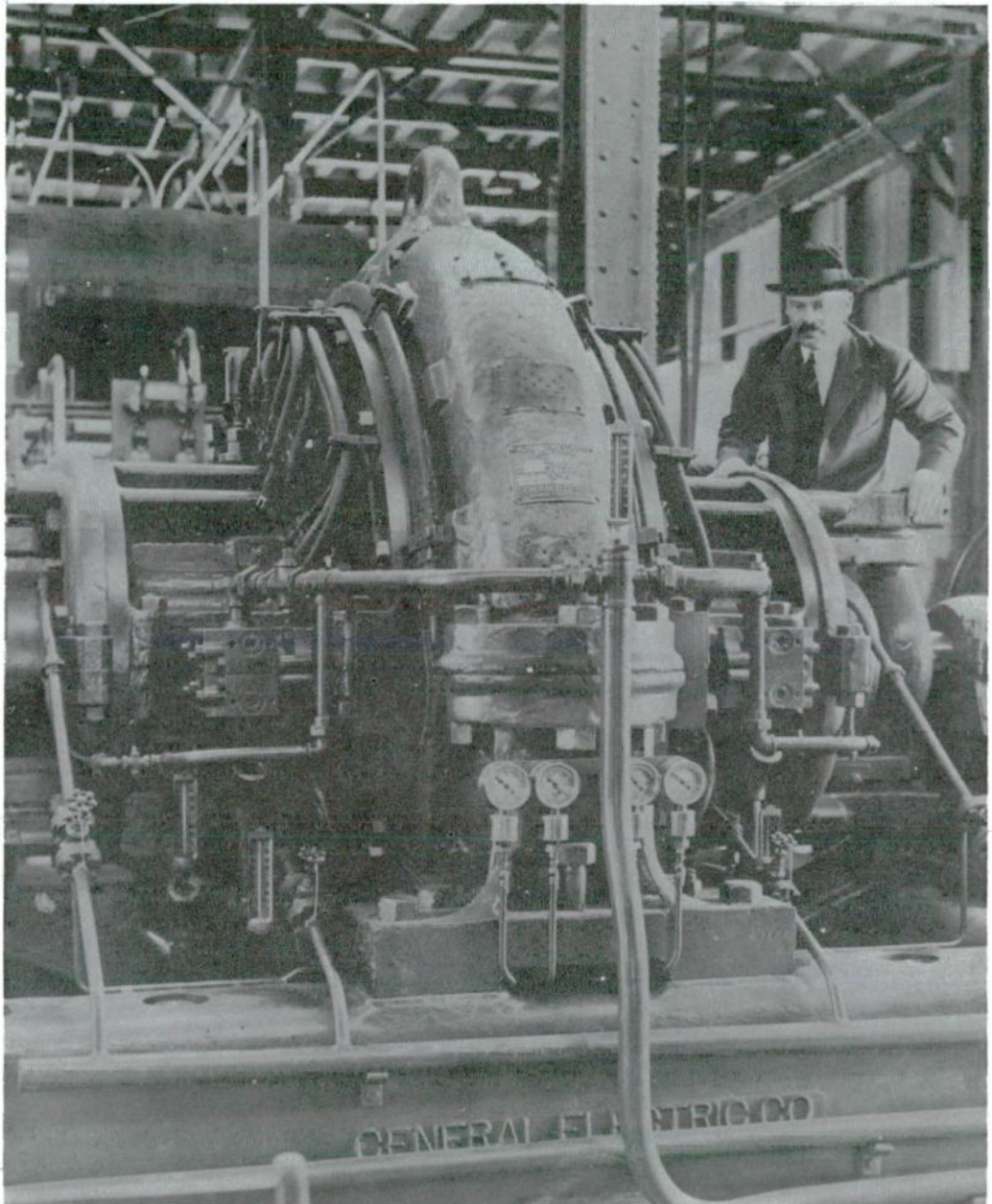
Source: Yates and Pacent (1920), page 61.

arc was normally a huge, expensive, water-cooled device, but it could be applied to smaller shipboard installations. In 1909 Cyril F. Elwell purchased United States rights to it and set up the Federal Telegraph Company of California to exploit its potential. In the years around the beginning of World War I, the U.S. Navy's enthusiasm for this device resulted in contracts for several shore stations capable of long-distance communication with the fleet. The largest Poulsen arc station, started during the war but not finished until 1920, was at Bordeaux, France. This 1,000 kw station was perhaps the high point of trying to span the Atlantic with brute power. The Poulsen patents controlled by Federal were important in the years immediately after World War I (see 3.1), and the Poulsen arc remained in shipboard installations until the start of World War II.

The next major system, also developed before World War I, was the alternator, originated by Fessenden and built to his specifications by GE. The first was delivered in 1906 and soon others followed. By 1911, after Fessenden had ended his association with his financial backers, GE engineer E. F. W. Alexanderson rapidly perfected ideas of his own.

The Alexanderson alternator was a huge piece of machinery, very much like a power-plant generator but rotating much faster. Such high-speed rotation offered complex mechanical problems, but by 1909 Alexanderson had developed a 100,000-cycle alternator that produced smooth, continuous waves. Although the first successful unit produced only 2,000 watts, higher power soon followed, and, by 1915, 50 kw units were being built. After long negotiations, GE and British Marconi agreed that Marconi would have exclusive rights to use the alternator, and GE would have exclusive rights to make it. The first

The Alexanderson Alternator / Alternator inventor E. F. W. Alexanderson is seen watching one of the 50 kw alternators in action. These huge machines were the first effective means of long-distance and transatlantic communication by wireless. Photo courtesy of General Electric.



50 kw unit was installed in New Jersey in 1917, and the following year a 200 kw unit, the most powerful and efficient transmitter in the world, was installed at New Brunswick, New Jersey. Using the government call letters NFF, the powerful unit announced President Wilson's Fourteen Points to the world in 1918. The agreement between Marconi and GE was set aside during the war but was to become instrumental in structuring American radio immediately afterward (see 3.12).

The next means of transmission, still in use today, involved vacuum tubes. Although experimentation began around 1912, high-powered vacuum-tube transmitters did not become common for more than a decade. Thomas Edison first noted that a heated filament gave off electrons—the blackening of a light bulb, or “Edison effect.” In 1904 John Ambrose Fleming, working for British Marconi, discovered that, since electrons were negative, a positively charged plate could collect them. Therefore, electricity would flow whenever the plate was positively charged. When the plate was negatively charged, no current would flow. This made the tube a perfect one-way gate or *valve* that could be used to change alternating current, such as a radio wave, to pulsating direct current. This one-way flow, in a process known as *detection*, enabled one to hear an audible signal of dots and dashes or speech no matter how high above audible range the radio wave frequency was. Detection was essential to radio reception (see 2.22). De Forest inserted into the Fleming valve a third element, a grid carrying a slight charge that could be varied from neutral, which offered no hindrance to current, to slightly negative, which would block current. This invention made a vacuum tube function as an amplifier, since the larger current flowing from filament to plate

would vary in step with a much smaller control current placing a charge on the grid. De Forest first used his triode, or Audion, as an amplifier as well as a detector early in the century. AT&T engineers (see 2.123), improved the device—by using a high rather than partial vacuum, for instance—and put it to work as an amplifier on long-distance telephone lines, including the first transcontinental one in 1915.

Because of their lighter weight and low current demand, vacuum tubes were used during World War I for specialized receivers and transmitters—after the navy had agreed to indemnify manufacturers for patent infringement suits. This was necessary since de Forest controlled the use of the third element and Marconi owned the rights to the first two elements, which together formed the diode, or Fleming valve. As early as October 1915, speech and music traveled across the Atlantic from the U.S. Navy station at Arlington, Virginia (NAA), to the Eiffel Tower in Paris—with the help of some 500 triodes connected in series. Even though this experiment showed the advantages of the vacuum-tube transmitter, including its freedom from problems of moving machinery and its small bulk and weight in relation to distance covered—an even greater relative saving than the transistor offered in recent years—the alternator still worked well for code transmissions for many years. It was for the transmission of music and speech, and broadcasting in particular, that the vacuum-tube transmitter became essential.

2•22 Reception

In 1900 the only device generally available for detecting radio waves was the Branly-Lodge coherer, as modified slightly

by Marconi. It was very delicate, permitted only slow message speeds because of its need to be tapped regularly between incoming pulses, occasionally gave false indications, and was not readily adaptable to tuning. Marconi's 1902 magnetic detector was more sensitive, permitted reception over 500 miles by day and 1,500 by night, but was hard to construct. During the period from 1903 to 1908, Fessenden developed an electrolytic detector that was used extensively until about 1913. This silent and automatic device needed no "tapper" since it used liquid rather than particles.

A completely different approach led to the development of the crystal detector around 1906 by Greenleaf W. Pickard and H. H. C. Dunwoody. Pickard had found that a crystal of silicon would allow electricity to flow in one direction. Using a small metal point, called a *cat's whisker*, to find the most effective spot on the crystal, he constructed a detector of radio waves far less expensive than previous models and just as effective. Dunwoody discovered that carborundum, an extremely hard, electrical furnace by-product, also would work well. By allowing electricity to flow in one direction only, it converted the very rapidly alternating *radio-frequency* wave into a series of pulses whose variations in strength (amplitude) were in the audio-frequency range to which earphones and the human ear could respond. These detectors were the first *solid state* devices and, for several decades, the only ones. The crystal detector permitted hundreds of thousands of hobbyists and the general public to pick up radio signals—for the price of a pair of earphones and a few cents' worth of wire, crystal, and cat's whisker. The major drawbacks of the crystal set—which was in general use for decades, and which hobbyists still use—were the dif-

ficulty of finding the right spot with the cat's whisker—solved by permanently affixing the whisker at the factory and sealing the crystal in a case—and the inability of such a simple receiver to amplify the weak incoming signals.

In its original form, the Fleming valve (see 2.21), which permitted electricity to flow in only one direction, could function as a detector. Although the 3-element de Forest Audion, patented in 1906–1907, also could be used as a detector, it did not improve detection per se. Its greatest value was in amplifying weak incoming radio waves. A radio-frequency amplification stage or two before the detector and an audio-frequency amplification stage or two afterward would permit reliable reception of exceedingly weak radio signals—and this eventually led to the use of loudspeakers instead of earphones. Manufacturing tolerances were at first loose, permitting inconsistent results that kept de Forest tied up in patent suits for many years. Although associated circuitry was not well understood at the time, the invention of the amplifying triode proved critical to the future development of radio.

At about the time de Forest sold telephonic rights to the Audion to AT&T, Edwin Howard Armstrong, best known later as the inventor of FM, was working on circuitry that would use the Audion as a transmitter, as well as an amplifier and detector in a radio receiver of unsurpassed sensitivity and selectivity. Within a few months of each other in 1914, de Forest and Armstrong individually applied for patents on what became known as the regenerative or *feedback* circuit. One of the longest and bitterest fights in radio history resulted from this conflict over patent priority, leading in 1928 and again in 1934 to the United States Supreme Court. Although the engineering community gener-

ally believed that Armstrong had a sounder grasp of the principles behind the circuit than de Forest had, the court held in favor of de Forest. Today, engineering texts and organizations generally give Armstrong credit for this crucial invention, but the law gave it to de Forest. The struggle embittered both men.

The regenerative and superregenerative receivers were very sensitive, but required extremely delicate tuning to keep them from oscillating so that no intelligible sounds could get through and interference would disrupt reception elsewhere in the vicinity. The solution lay in the heterodyne receiver, patented by Fessenden as early as 1905, and in the superheterodyne receiver, invented by Armstrong in 1918 and still in use today. These circuits were not practical until the development of the Audion.

Besides detecting and amplifying incoming signals, it was necessary at the turn of the century to find a means of *tuning* to a single station so that stations on nearby frequencies could operate without interference. Techniques were being explored: Sir Oliver Lodge had patented a system he called *syntononic tuning* as early as 1897, and, shortly afterward, both Marconi in England and John Stone Stone in America developed ways of selecting desired frequencies and rejecting unwanted ones through the principle of resonance. When a singer sings a note that hits the resonant frequency of a glass, acoustical energy is transferred so efficiently that it shatters the glass. In the same way, proper adjustment of the inductance or capacitance in a tuning circuit of a receiver—or transmitter, for that matter—can set up a condition whereby only the desired or resonant frequency is picked up. As usual, a patent fight ensued, but both patents—and the lives of the two inventors—expired before the case was settled.

2•3 Maritime Applications

Radio equipment for more than experimental purposes was first installed on oceangoing ships and in the shore stations that were built to communicate with them. Much as the telegraph had nearly doubled the railroad's freight-carrying capacity through more efficient scheduling and routing, so radio enabled ships to improve their cargo pickup schedules, to inform owners of their approach, and to learn of weather and other conditions en route. Over and above these commercial benefits, however, at least in the public mind, was the safety of lives and property at sea.

2•31 *Wireless and Commercial Shipping (to 1914)*

As early as 1899 ships in distress were calling for help by radio. Marconi's reputation in Great Britain grew after the crew of a coastal lightship was saved from a severe storm in this way. In 1909 when the liner *Republic* collided with the *Florida* in a fog off the East Coast of the United States, the radio operator on the sinking liner stayed at his post and issued a call for help that resulted in saving almost all those aboard. In that same year, passengers and crew on 18 other ships with radio installations were saved, thanks to radio, but those on many more ships without radio were not. One of the biggest peacetime maritime disasters was the sinking of the liner *Titanic* on her maiden voyage in April 1912. The ship rammed an iceberg and three hours later went to the bottom off the Newfoundland Banks together with 1,500 passengers and crew. Some 700 were saved by a ship that picked up the *Titanic*'s wireless call for help 58 miles away, but a much nearer ship did not assist because its only radio operator, after many hours on

duty, was sound asleep when the messages came over the radio.

This disaster pointed up the necessity not only for radio installations but enough qualified operators to man the apparatus, and led to tighter regulation of radio equipment on passenger and larger ocean-going cargo ships. The *Titanic* disaster also directed attention to a young Marconi operator assigned to the New York station, atop the John Wanamaker department store. With the airwaves cleared by government order, he stayed at his post for many hours, sending messages to coordinate rescue traffic and compile a list of survivors. It was not long before this operator, David Sarnoff, was named commercial manager of American Marconi, and years later he became president and then chairman of the board of RCA.

When Marconi first started installing wireless in ships, his was the best equipment available. Other apparatus could be used, but Marconi and his business associates found ways to keep Marconi apparatus most in demand. A 1901 agreement with the Lloyds of London insurance pool to equip Lloyds' signal stations served to gain acceptance and prestige for Marconi equipment early on; and Marconi allowed its shore stations to communicate only with ships that rented Marconi equipment and trained operators. As various nations began passing laws regulating radio to save lives at sea, and as ship-owners became more aware of its commercial benefits, more and more vessels acquired Marconi apparatus. To support their own manufacturers, nations other than England permitted or suggested other brands of wireless apparatus, but ships equipped with them could not—until after 1903 (see 2.4)—then communicate with Marconi shore stations.

By the start of World War I, British Marconi stood preeminent in the field.

It controlled wireless communications throughout the British Empire and had taken over the assets of de Forest's United Wireless, thus controlling—through its subsidiary, the American Marconi Company—90 percent of all American ship-to-shore commercial communication.

Some specialized radio operations did not need interconnection with Marconi installations. As early as 1904, the United Fruit Company used de Forest apparatus to make ships available for loading fruit as soon as it was ready to pick. In 1907, switching to Fessenden equipment, United Fruit constructed the first radio-transmitting facilities in most of the Central American republics. It established an operating subsidiary, Tropical Radio Telegraph Company, in 1913 and was among the leaders in upgrading transmitting and receiving equipment—sometimes because a hurricane had conveniently blown away the obsolete gear. By the early 1920s, United Fruit had invested nearly \$4 million dollars in establishing radio in the region, equipping its ships, and even acquiring patents on a crystal receiver.

For dispatching of ships, radio had no equal. For point-to-point messages, however, undersea cable offered strong competition. In 1907 British Marconi offered transatlantic wireless telegraphy at only 18 cents a word, as compared to the cable companies' 25-cent rate. The greater reliability of cable evened the odds and helped to prolong this commercial war for many years. Radio had more luck in the Pacific, where fewer cables meant less competition and less interference meant greater reliability.

2•32 *Wireless and the U.S. Navy*

The first important armed-forces tests of radio were conducted indepen-

dently by the United States Navy and the British Royal Navy in 1899. The American tests were made of Marconi apparatus aboard the U.S. battleships *New York* and *Massachusetts*. Although radio signals bridged distances of up to 40 miles, it was clear that the lack of suitable tuning devices led to unacceptable interference. Furthermore, the just adopted Marconi policy of renting rather than selling equipment and services was politically unacceptable. Obviously, the navy could not accept being dependent upon a foreign power, no matter how friendly.

For the next few years, the navy searched for a different, reliable radio system, in the meantime not using any wireless at sea. Neither the de Forest nor the Fessenden systems seemed to do the trick, nor did various European systems. In 1903 the navy installed some German (Slaby-Arco) apparatus on ships of the North Atlantic Fleet, which gave them a clear advantage in war games over another part of the fleet without any radio communications. At the same time, the navy started to build powerful shore stations, and by 1904, 20 of these were in operation. One of these, in Arlington, Virginia, broadcast precise time signals, a useful aid to navigation.

As early as 1905, after further comparative tests, the navy began a conscious swing to American-made equipment. In 1907–1908 it gave de Forest a scant month to install radiotelephone transmitters on the ships of the Great White Fleet, being readied for an around-the-world “show the flag” mission. Partly because of hasty installation, these devices worked poorly, except for the one on the U.S.S. *Ohio*, which transmitted voice and music to the crew, to other ships in the fleet, and to listeners in ports of call. However, these unreliable radio telephones were removed when the fleet returned in 1909, and in-

terest in naval wireless telephony languished for nearly a decade until the United States entered World War I in 1917.

During this period, the navy concentrated on expanding shore stations and shipboard wireless telegraphy installations. In 1912 it began building a chain of stations to connect American bases in the Pacific, including Hawaii and the Philippines, at the same time that British Marconi was constructing the “Empire system” for use of the Royal Navy and to eliminate the British Empire’s dependence on easily severed cables. After contracting with the Federal Telegraph Company for a Poulsen arc installation at the Arlington station in 1913, the U.S. Navy installed similar transmitters in the Pacific, including one of 500 kw in Manila. Coastal shore stations in the United States were located a few hundred miles apart so that, if one station was out of operation, another could reach naval units at sea. Unfortunately, most of this equipment could function over only a few hundred miles to two thousand or so miles—a serious drawback if the navy expected the fleet to be in action across the Atlantic or Pacific.

Another drawback to the navy’s use of radio was the resistance of personnel to innovation. Most shipboard installations were primitive, hand-built affairs. Few men were adequately trained to get the most from them, and fewer still cared to learn. Doubtful senior officers discouraged diversion of scarce navy funds for wireless, and field commanders disliked being tied to headquarters by an electronic umbilical cord. The telegraph had already limited the freedom of army commanders to “fight their own war,” but, until the advent of wireless, naval commanders retained independence due to the nature of their forces and battleground. Nevertheless, foresighted naval officers realized that wireless would be useful in wartime—

if its problems and drawbacks could be overcome.

2.4 First Attempts at Regulation

Radio clearly was such a potential saver of lives and property in peril at sea that otherwise acceptable practices that interfered with its operation there had to be overcome. British Marconi's policy not to communicate with users of other companies' facilities, even sometimes in an emergency, was seen as a blatant attempt to establish a monopoly. Interference was increasing as more stations went on the air and receivers became more sensitive. It occurred not only between ship stations but between ships, land stations, and a growing number of amateur stations.

Other factors helped to sway public opinion in the direction of government control of radio. Business scandals involved de Forest in this country and Marconi stock in the United Kingdom. The growing militant nationalism in most technologically developed countries worsened the confusion over rates, equipment standards, and interconnection procedures. How could radio achieve full stature when each nation rallied around its own radio equipment manufacturers, and based industry standards on political policy rather than technology? Some international solution to these problems was indicated.

As early as 1903, the government of Imperial Germany called the first international convention on radio. This Berlin Conference stemmed partly from the refusal of the Marconi Company to relay signals from a yacht belonging to a German prince on a visit to North America. The eight nations attending—except for the United Kingdom and Italy, which not surprisingly supported the Marconi position

—issued a protocol calling for all wireless systems to communicate under all conditions with all other wireless systems. With the requirement that each country would have to pass the enabling laws, the meeting adjourned with plans to reconvene the following year.

The subsequent meeting was postponed once—Great Britain and Italy still were not ready—and then again—the Russo-Japanese War of 1905—and finally took place in Berlin in 1906. Delegates from 27 nations—including the U.S. with a naval officer delegation—worked out two protocols, one for ship-to-ship and the other for ship-to-shore communication, both calling for communication without regard for the type of equipment used. Also the international distress call was changed from CQD (roughly, "calling all stations, disaster") to an arbitrary three dots, three dashes, and three dots all run together: the famous SOS still in use.

These agreements were to take effect on July 1, 1908, but there were many delays and complications. Countries with Marconi contracts asked for time to work them out. In the United States, Congress initially refused to ratify the agreements, accepting the testimony of American wireless-manufacturing firms that they would stifle development of radio and place it under international rather than national control. It was not until the planners of a third conference, to be held in London in 1912, quietly withdrew the invitation to the United States that Congress passed the first radio law in this country, the Wireless Ship Act of 1910.

The absence of a specific law did not mean that Americans were not trying to settle the problem of interference between stations, which was caused largely by the uncoordinated use of radio by private commercial and experimental stations, the army, the navy, the Weather

The Beginnings of Radio Regulation / (excerpts from three key acts)

An Act to Require Apparatus and Operators for Radio Communication on Certain Ocean Steamers, approved June 24, 1910 . . . it shall be unlawful for any ocean-going steamer of the United States or of any foreign country, carrying passengers and carrying fifty or more persons, including passengers and crew, to leave or attempt to leave any port of the United States unless such steamer shall be equipped with an efficient apparatus for radio-communication, in good working order, in charge of a person skilled in the use of such apparatus, which apparatus shall be capable of transmitting and receiving messages over a distance of at least one hundred miles. . . .

. . . That for the purpose of this act apparatus for radio communications shall not be deemed to be efficient unless the company installing it shall contract in writing to exchange, and shall, in fact, exchange, as far as may be physically practicable, to be determined by the master of the vessel, messages with shore or ship stations using other systems of radio-communication.

An Act to Amend the Act of 1910, approved July 23, 1912 . . . an auxiliary power supply, independent of the vessel's main electric power plant, must be provided which will enable the sending set for at least four hours to send messages over a distance of at least one hundred miles day or night, and efficient communication between the operator in the radio room and the bridge shall be maintained at all times. The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated . . .

An Act to Regulate Radio Communication, approved August 13, 1912 . . . That a person, company, or corporation within the jurisdiction of the United States shall not use or operate any apparatus for radio communication as a means of commercial intercourse among the several States . . . except under and in accordance with a license, revocable for cause, in that behalf granted by the Secretary of Commerce and Labor upon application therefore . . .

That every such license shall be in such form as the Secretary . . . shall determine and shall contain restrictions . . . on and subject to which the license is granted; . . . that every such license shall be issued only to citizens of the United States . . . shall specify the ownership and location of the station . . . and other particulars for its identification and to enable its range to be estimated; shall state the purpose of the station . . . shall state the wavelength or the wavelengths authorized for use by the station for the prevention of interference and the hours for which the station is licensed for work . . .

Bureau, and the Department of Agriculture. A board set up in 1904 by President Theodore Roosevelt to resolve these difficulties recommended navy control of most radio, especially in wartime; legislation to prevent commercial interests from controlling radio; peacetime direction of radio by the Department of Commerce and Labor; and installation of government stations in all United States territories. Although none of these suggestions was formally adopted, one could trace their basic outline in American radio regulation for nearly two decades.

The Wireless Ship Act of 1910, which Congress passed after several attempts, contained in one page nearly all called for in the 1906 Berlin protocol: ocean-going vessels with 50 or more passengers traveling between ports 200 or more miles apart had to carry radio apparatus capable of reaching 100 miles day or night and an operator to run it. Partly because of the lesson learned from the *Republic* disaster, and partly because the law created a market for more sales, the manufacturers accepted this act. It met the demands of the 1903 and 1906 conferences indirectly, calling for "an efficient apparatus for radio-communication" and then defining "efficient" by stating that "apparatus for radio-communication shall not be deemed to be efficient unless the company installing it shall contract in writing to exchange, and shall, in fact, exchange . . . messages with shore or ship stations using other systems of radio-communication." This approach, together with similar laws passed in other countries (one in the United Kingdom as early as 1904 called for trained radio operators), solved the problem. It is interesting to note that the 1910 act was not cited as a precedent when television was faced with the problem of sets that could not pick up UHF channels in the late 1950s and early 1960s.

In 1912 some 29 nations met in London and agreed to strengthen the 1906 protocol, particularly, as a result of the *Titanic* disaster that year, in recommending that two operators be available on most vessels. The United States amended the 1910 act to provide that any ship with 50 or more passengers, regardless of distance between customary ports and including the Great Lakes for the first time, had to have radio, an auxiliary power supply capable of operating it, two or more operators, and good communication between the radio operator and the bridge. A month later, in August, Congress passed the Radio Act of 1912, which took seven pages to spell out public policy (stations had to be licensed by the Secretary of Commerce and Labor, government stations had priority, etc.) and standards of operation (messages were to be secret, wavelengths and transmitter power were to be selected for minimal interference, etc.). This law governed the regulation of radio, including the as yet little-known concept of broadcasting, until 1927.

2.5 The First Broadcasters

In selecting the most important early broadcasters, one has to use a detailed definition of broadcasting. For example, although Stubblefield transmitted speech successfully (see 2.11), he hardly intended to reach the general public, a major criterion in our definition, and his transmissions apparently relied on induction, which is inherently short-range, rather than on radiation. In another example, Théodore and François Puskás linked telephone subscribers in Budapest to a central unit that provided a news and music service. However, this "Telephonic Newspaper," which ran from 1893 until at least the middle 1930s, used wire or cable,

not radio—in a process called *rediffusion* still used in a number of countries. This might be thought of as the precursor of cable television (CATV), but it was not broadcasting by radio to the general public. Early in the century an ingenious operator at the Mare Island navy base in California had produced musical tones by rapidly changing the speed of rotary generators of radio waves so that the musical pitch of the signal changed—similar to the musical games played today with “touch tone” telephone equipment.

However, there were numerous examples of true broadcasting before its commonly accepted inauguration on KDKA late in 1920 (see 3.21). Fessenden’s Christmas Eve 1906 broadcast was one. Fessenden had tried to ensure a maximum audience, and, although some ship operators and a smattering of reporters in New York had to act as surrogates for the general public, this transmission was intended for a general audience; it was telephony, speech and music; it required no special knowledge for decoding; and anyone with a receiver could pick it up.

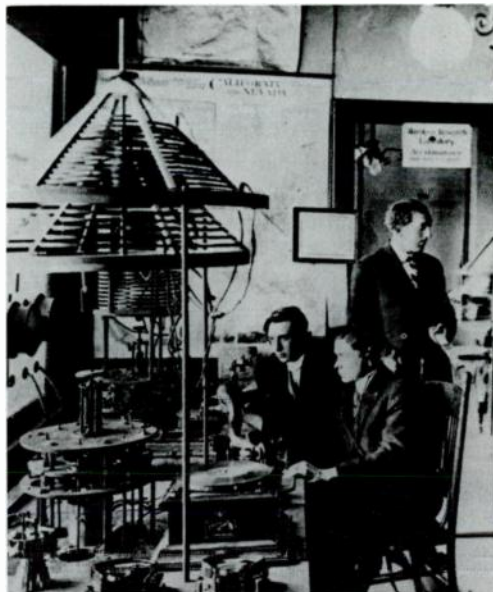
But neither Fessenden nor de Forest, who made a number of broadcasts in 1907 and 1908, had incentive to establish a regular public series of broadcasts. Their stations were experimental and promotional, and the service they provided to listeners was incidental. Except that they were better known and that their equipment was more powerful than most, they were amateur radio operators, or hams. By 1912 there were more than a thousand such hobbyists, most of them interested primarily in communicating with fellow amateurs, almost exclusively by Morse code, and not in broadcasting. However, by 1915, having formed a national organization, the American Radio Relay League, and established a magazine, *QST*, they had become a potential political

power, a source of trained operators for wartime, and an important group of listeners, as well as tinkerers whose curiosity and work led to many important advances of the technical radio art.

Perhaps the strongest claimant to being first to broadcast intentionally to a general audience, using electromagnetic waves, on a schedule, and with voice rather than code transmissions, was Charles D. “Doc” Herrold, who operated a College of Engineering and Wireless in San Jose, California. He was not the first to broadcast speech and music, not even in California, but early in 1909, as an adjunct to his school, Herrold presented regularly scheduled news reports and musical programs. Starting with a spark gap transmitter, he soon developed an arc that transmitted better quality voice and music. At first he broadcast only on Wednesday nights for an hour or so but soon changed to every day. Herrold built some receivers and made them available for public use in hotel lobbies. In 1915, during the San Francisco Exposition, the station broadcast six to eight hours a day with de Forest apparatus receiving its transmissions at the convention site. De Forest later said that Herrold’s station “can rightfully claim to be the oldest broadcasting station of the entire world. . . .” When the Radio Act of 1912 was passed, Herrold’s station was licensed and operated until World War I, when all amateur stations were closed down. Herrold resurrected the station in December 1921 or January 1922 under the call letters KQW, using more conventional apparatus than the “Herrold System of Radio Telephony,” which would not work on the wavelengths the Secretary of Commerce then assigned for broadcasting. KQW, later sold and moved to San Francisco, still broadcasts as 50,000 watt KCBS, with a legitimate claim as the descendant of the *first* broadcasting station in the

Herrold's KQW: The First Real Station?**WIRELESS TELEGRAPH
TO BE DEMONSTRATED****PROF. HERROLD, FORMER SAN
JOSEAN, HAS MADE MANY
INTERESTING EXPERIMENTS****WILL PERFORM FEAT OF FIRING
MINIATURE POWDER MINE
BY WIRELESS**

Public interest is focusing on a novel form of entertainment to be given in the Y.M.C.A. Hall, Friday evening July 16th. Chas. D. Herrold, a former San Josean will appear here for the first time in a lecture "The Story of Wireless." He has devoted a number of years to a careful experimental study of wireless telegraphy and telephony. For several months past he has had a system installed on board the sloop Dorothy on the San Joaquin River and a permanent station at Stockton. A portable outfit was also sent to Vernalis, Cal. and his assistant in charge kept in touch with him by ether waves. In the Friday evening entertainment he will show the public how it is possible to time two stations so that other stations cannot get the messages. He will perform the feat of firing a miniature powder mine by wireless and will have installed on the stage a complete wireless station. The equipment includes two large Rumkoeff Tesla [sic] coils capable of producing 400,000 volts of electricity. A feature of the entertainment will be a perfect imitation of lightning. A series of long, zig-zag discharges will be led over a plate 12 feet long under the enormous tension of nearly 500,000 volts.



"Doc" Herrold stands at the doorway of his second station, about 1913. The large circular cones on the table are part of Herrold's own system of wireless telephony, which he used until World War I. Photo courtesy of KCBS Radio.

Source: San Jose Daily Mercury news item Thursday morning, July 15, 1909. Courtesy of San Jose Mercury.

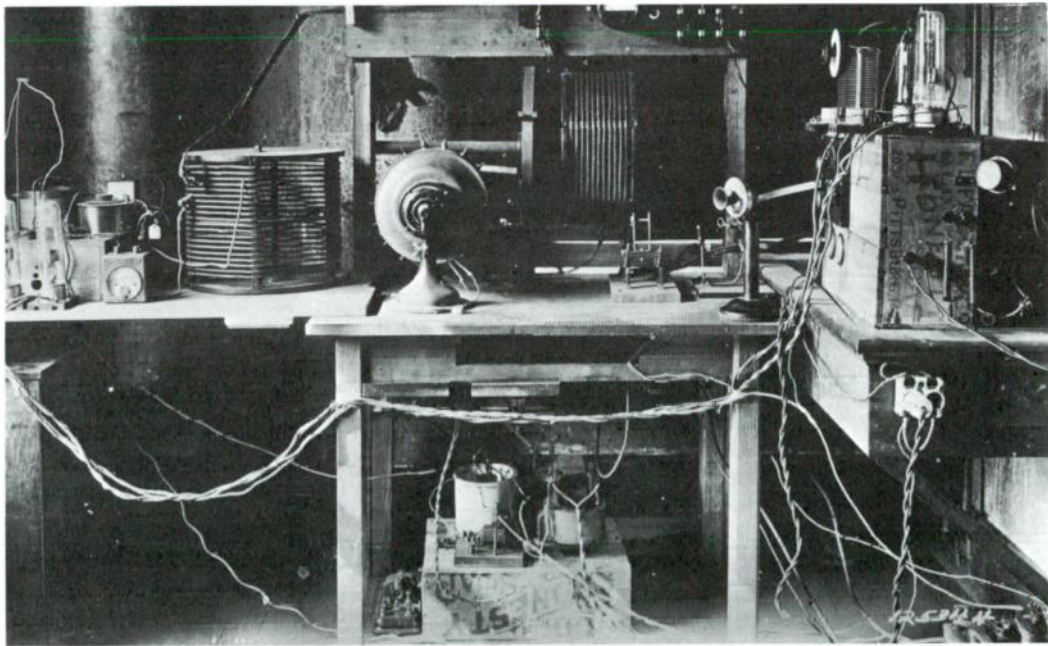
United States—even though the delay in returning to the air after World War I had destroyed its claim as the *oldest* station now operating (see 3.2).

Herrold was but one of a growing number of experimental broadcasters. From 1912 to 1914, Alfred Goldsmith operated station 2XN at City College of New York. In 1916, G. C. Conner and C. V. Logwood broadcast music over 2ZK in New Rochelle, New York, for an hour each evening. In East Pittsburgh, Pennsylvania, Westinghouse engineer Frank Conrad began that same year to send voice and music programs from his home to the Westinghouse plant five miles away. Soon he was scheduling music broadcasts for friends—a humble beginning for an enter-

prise we will discuss in the next chapter (see 3.21). At the University of Wisconsin, Professor E. M. Terry set up 9XM (later WHA) for telegraphic weather forecasts and market reports for mariners on the Great Lakes and farmers. Allowed to stay on the air during World War I, Terry also experimented with voice broadcasts, the genesis of WHA's claim to be the first station. Some experimenters of this period reached great distances with their low-power transmitters because there were few stations to offer interference.

Even as experimentation in broadcasting progressed, most radio people believed that the future of radio lay with *narrowcasting* or point-to-point communication, particularly between mobile stations

Conrad's "Home" Station / Equipment used by Dr. Frank Conrad, assistant chief engineer of Westinghouse, in the years before KDKA was established in 1920. Conrad transmitted radio telephone programs from his garage, using the call letters 8XK. Photo courtesy of Westinghouse and Joseph E. Baudino.



or over difficult terrain. "Radio people" in this instance included the major electrical and wireless firms, who would have to support any new use of radio. One exception was David Sarnoff, who, some years after his outstanding service at the Marconi station in New York during the *Titanic* disaster, had been promoted to commercial manager of American Marconi. In a 1916 memo to Edward J. Nally, general manager of the firm, he proposed:

. . . 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 problem of transmitting music has already been solved in principle and therefore all the receivers attuned to the transmitting wavelength should be capable of receiving such music. The receiver can be designed in the form of a simple "Radio Music Box" and arranged for several different wavelengths, which should be changeable with the throwing of a single switch or pressing of a single button. . . . The box can be placed on a table in the parlor or living room, the switch set accordingly and the transmitted music received. There should be no difficulty in receiving music perfectly when transmitted within a radius of 25 to 50 miles. . . . The same principle can be extended to numerous other fields as, for example, receiving of lectures at home which can be made perfectly audible; also events of national importance can be simultaneously announced and received.

Although Sarnoff's memo was filed and forgotten for years, public interest in radio was exhibited by more than 8,500 licensed amateurs, some of whom transmitted voice and music, and most of whom listened. However, the complexity and unreliability of equipment, the necessity for ear-phones, and the limited programming

tended to restrict radio to the engineering-minded. Neither engineers nor businessmen had much interest in visionary schemes.

2•6 Radio at War

Armies had used the telegraph for 50 years, and World War I added all the newer devices that could be converted to warfare—the automobile, the airplane, the radio—and stimulated their development as well. Although the war halted most private experimentation and closed amateur stations, the army and navy's need for reliable, efficient apparatus for communication hastened the introduction of wireless in all forms.

2•61 Radio in World War I

In the Gulf of Mexico, the U.S. Navy was able to intercept some Mexican ships during an incident prior to America's entry into World War I, thanks to radio. In Europe, Germany had had to turn to radio when Britain cut Germany's cable connections early in the war. Germany used radio sometimes for propaganda but usually for scheduling and dispatching commercial and naval vessels. Its "broadcast" nature, however, permitted the British to intercept German messages and decipher them with the aid of a captured code book. One message, sent by the German Foreign Ministry to their ambassador in Mexico City, proposed offering the Mexicans large chunks of United States territory if Mexico would join Germany in the event of war with the United States—the famous "Zimmermann Telegram." The British were delighted to inform the United States government, and the world, about the perfidy of the Germans and pro-

vided Washington with the key to the German code. What made this more infuriating to the Americans was that a German-owned but American-navy-operated station in New Jersey had relayed the original message, still in code, as a diplomatic courtesy.

The navy was operating the German-owned transmitter because the government had taken over all high-power stations—even American Marconi's—as a national security measure. All amateur stations, including broadcast experimenters, were closed down in 1917. The navy's own 35 coastal stations, its high-power chain across the Pacific, and radio telegraph apparatus on nearly all major vessels had cost about \$20 million by April 6, 1917, when the United States entered the war. After that date, the navy also acted as censor on all wireless and cable communication channels and the government took over the railroad and telephone industries, the latter assigned to the Post Office Department. The navy communicated with the fleet in European waters from major shore stations including the American Marconi installation at New Brunswick, New Jersey. This station was particularly important, since it used a 200 kw Alexanderson alternator, which had replaced the 50 kw one and could be heard all over Europe.

With its great interest in rapid and efficient communication, the navy was in an excellent position to use wireless. However, it suffered from two shortages: trained personnel and top-flight equipment. The first shortage was solved through recruiting amateur operators and establishing radio schools around the country, including one at Harvard University. By the Armistice, November 11, 1918, some 7,000 men had been trained and 3,400 were under instruction. This group, added to the thousands of hams who managed

to keep up their interest in wireless during the war, strongly influenced postwar radio developments.

Technologically, radio advanced during the war. Lightweight vacuum-tube transmitters and receivers were developed. Even airplanes carried them, including one set designed by Major Edwin Armstrong. Low-power, tactical radio sets were not nearly so prevalent as they are today. In World War I, an army division of 20,000 men rarely would have more than six radio sets—one for each of four regiments, one for the artillery, and one at headquarters. (By the early 1950s, one transmitter served every 6.3 men in an army division, and today some units have even more.) Although radio added greatly to the flexibility of ground communication during World War I, the demands of reliability, secrecy, and relatively immobile trench warfare made telephone and telegraph service more common than wireless.

2•62 *The First Patents Pool*

The navy could requisition high-power stations from private companies, train operators for them, and close down domestic stations to prevent the transmittal of espionage, but obtaining efficient and modern shipboard radio equipment was another story.

Vacuum-tube equipment was obviously the best, but nobody could legally make triode vacuum tubes when de Forest controlled the patent on the third electrode and Marconi controlled the Fleming patents on the first two electrodes. Furthermore, some of the navy's earlier sources were busy making equipment for either the Germans or the Allies. Litigation on the de Forest and Fleming patents had continued for years, and court decisions in 1916 tied most companies into knots. Years

Use of Radio by the U.S. Army and Navy in 1917–1918

The Army Signal Corps Although a transatlantic radio station was built near Bordeaux, the War Department in Washington had no radio contact with its commanders in the field, and these commanders had no very dependable wireless systems among themselves. Radio carried little of the war's communications load. In the first place, the tactical situation again and again brought the Western Front into small areas and mired it there. For another reason, although nearly 10,000 radio sets, chiefly airborne radiotelegraph, were produced for the Signal Corps and Air Service, the conflict was over too soon for the combat signalman or aviator to use them much. Finally, radio was too new to have passed the awkward age. Spark-type equipment did have the advantage of not requiring a skilled man to tune it or mend it, but was so heavy it could scarcely be moved, was often unintelligible, and was frequently out of commission. Tube equipment generally replaced it. Radio's chief use was for intelligence work. At goniometric stations it took what were later called "fixes" upon enemy transmitters and identified their location by the intersection of the angles. It intercepted German ground telegraph, telephone, aircraft, and artillery signals. . . . The most interesting aspect of Signal Corps radio in World War I was the consolidation of the hitherto scattered efforts in scientific research . . . [but] for the most part, none of the laboratory improvements got into production before the Armistice. Had any been developed before the war, radio history would have been made, for the critical inadequacy of equipment necessitated remarkable advances in the field.

Source: Dulany Terrett, *The Signal Corps: The Emergency* (Washington: Government Printing Office, 1956), pages 18–19.

Naval Radio In the operating field the Navy became the sole agency, with the exception of U.S. Army field communications, for providing U.S. radio communications, both military and commercial, from the date we entered the war until 1 March 1920. Much was done during the period to increase the reliability of long-range communications by encouraging the development of higher powered arcs and alternators and by the Navy's own design of heterodyne and neu-trodyne receivers, multiple-stage amplifiers, and other ancillary apparatus. By the end of the war, sufficient progress had been made in the development of static-reducing balanced antenna systems, together with improvements to transmitters and receiving equipments, to insure reliable transatlantic radio communications.

Source: Captain L. S. Howeth, *History of Communications-Electronics in the United States Navy* (Washington: Government Printing Office, 1963), page 209.

Iconographic Collection, State Historical Society of Wisconsin.



before, Western Electric (AT&T) had purchased some rights to the triode from de Forest, but not enough. If tube equipment was to become available, the patent situation would have to be resolved.

The wartime solution was an emergency pool of patents set up under navy protection. This offer of indemnification, in effect, said: "Use what you need to give us the best equipment, and if you are sued for patent infringement, we'll pay the bill." As the result, the navy could get the equipment, mostly from civilian plants.

At the end of the war, all the temporarily shelved problems came back, together with some caused by the war itself. Should the navy relinquish control over transoceanic wireless? What about the telephone industry, and the amateurs? How could the triode legally be manufactured and used? The patents pool had worked well; could it or should it continue? What about jobs for the returned radio operators? What about factories that had been turning out war-related radio apparatus? Should the government allow Marconi to expand its monopoly, particularly with respect to messages from America to Europe and the Pacific? Should Marconi alone have the Alexanderson alternator? The next chapter tells how these questions were answered.

2•7 The Stage Is Set

We can think of developments up to 1895 as background, for it was only with Marconi's active experimentation in that year that wireless began to move from theory to practice. The key people include Clerk-Maxwell, who first theorized about wireless communication; Hertz, who experimentally proved Clerk-Maxwell correct; Marconi, who took wireless from experiment to practical reality; Fleming, who developed the first vacuum tube with

two elements; Fessenden, the first important American experimenter and the first broadcaster; de Forest, who made amplification possible with his three-element vacuum tube; Alexanderson, who achieved the first reliable means of long-range wireless communication and unwittingly Americanized broadcast development; and Armstrong, who invented receiver circuits that greatly improved reception.

We can divide this era into the wireless experimental period (up to about 1900), practical maritime application (1900–1914), and radio in World War I (1914–1919). We see in these years first attempts at international and American regulation of wireless; intense nationalism in wireless development, with British interests dominating; and the first broadcasts and broadcasting stations both here and abroad. Of overriding importance was the control of key patents, determining which countries, business firms, and individuals would play leading roles. The most important concept, generally held, was that wireless was essentially a means of rapid, long-distance, point-to-point—narrowcast—communications, for international and maritime message transmission. Only a handful of experimenters grasped its potential for *broadcasting* to the public.

Further Reading

For an annotated review of the many books, journals, and articles on all aspects of electrical communications (including companies, persons, and inventions), see Shiers (1972).

The standard early histories of wireless development are Fahie (1901) and Lodge (1900), written from original sources by men active in the field. See also the historical chapters in Fleming (1906) and the Sivowitch article (1971). Overviews,

with far greater detail of men and their inventions, appear in Appleyard (1930) and Hawks (1927), with capsule biographies in Dunlap (1944). Standard histories focusing on technical developments are Blake (1928), which is exhaustive in detail; McNicol (1946), which clearly describes early inventions and how they built on one another; Howeth (1963), which tells the story of radio, and related inventions, up to about 1945 from the U.S. Navy's point of view; and the Maclaurin (1949) integrative analysis, a most fascinating and valuable book that clearly establishes the importance of and differences between the invention and innovation processes. Two more recent treatments of these early years are Dalton (1975), a multivolume survey with some good diagrams of important inventions, and Aitken (1976), a scholarly analysis of the origins of radio that likely will become one of the lasting works in this field.

Biographies of major inventors include those of Guglielmo Marconi: Dunlap (1937), Marconi (his daughter, 1962), and Jolly (1972). Baker (1972) is the definitive history of the Marconi firm. Fessenden is seen by his wife in Fessenden (1940), while de Forest wrote his own biography (1950). Armstrong's life is narrated in Lessing (1956 or 1969 editions), and Sarnoff's in Lyons (1966) and Dreher (1977). The development and role of the early amateur operators appears in DeSoto (1936) and in *50 Years of A.R.R.L.* (1965). The definitive history of the vacuum tube in all countries up to about 1930 is by Tyne (1977).

The earliest days of broadcasting are discussed in Archer (1938), Barnouw (1966), and, for a British view, Briggs (1961). Another useful British overview of wireless, stressing the operations of the Marconi company, importance of patents, and important inventions, is Sturmey (1958). Early regulation of wireless is reviewed best in Howeth (1963).

The Beginnings
of
Broadcasting
(1920-1926)



"There probably has never been a scientific development that was as quickly translated into popular use as was radio broadcasting."—Judge Stephen B. Davis, 1927



The Beginnings
of
Broadcasting
(1920-1926)



"I believe that the quickest way to kill broadcasting would be to use it for direct advertising. The reader of the newspaper has an option whether he will read an ad or not, but if a speech by the President is to be used as the meat in a sandwich of two patent medicine advertisements there will be no radio left."—Herbert Hoover, Secretary of Commerce, at the Third National Radio Conference, October 6-10, 1924

The war was over. America began to emerge from its isolation from the world, although the failure of the U.S. Senate to ratify the League of Nations Covenant showed we had a long way to go. Politically, the country drifted until the “normalcy” of the Harding administration starting in 1921. While many rural areas endured economic hardship, the corporate world in the cities faced the pent-up demand for all the goods and services unavailable since early 1917. Migration from countryside to city accelerated, while restrictive legislation slowed immigration from abroad. The new mobility of the automobile, adding congestion to the cities and creating the suburbs, expanded the

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The Beginnings of Broadcasting (1920–1926)

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immediate horizons of Americans. It took them to where things were happening. At the same time, the motion picture shattered barriers of time and distance and showed ordinary audiences a new, faster life outside their immediate surroundings. The changes in American attitudes that accompanied both these developments were ready targets for men and women who preferred a rigid, traditional, moral climate—such as the reformers who were flushed with Prohibition, their victory over Demon Rum.

The period became known as the Roaring Twenties. Radio would play a big part in communication of that frenzied lifestyle. The country's literary life was prolific, with young writers here and abroad turning out essays, novels, poetry, and plays that depicted the age. The first tabloid newspaper, the *New York Daily News*, appeared in 1919, followed by such untraditional magazines as *Reader's Digest* (1922), *Time* (1923), and *The New Yorker* (1925). Magazines generally used more photographs than print media had in the past and covered a greater variety of events and developments—not just the effects of the car and motion pictures, not just political scandals, but sports events, sensational crimes and trials, the rise in aviation, trends in science, and the latest fads. Behind this surge of activity in the media was the expanding role of business and the prosperity that business brought to many Americans who suddenly had more leisure and money than ever before.

It was against this background of national change that radio broadcasting began. Starting slowly, it quickly gathered pace to become one of the biggest and longest lasting fads. But before broadcasting could become an industry, several important economic, technological, and social developments had to occur both here and abroad. While foreign countries faced

the same problems, the American solution was unique.

3•1 Important Precedents

Though often forgotten today, several developments in the 1918–1922 period helped to set the pattern of American broadcasting. They received little public attention at the time but were far more important in the long run than later widely publicized occurrences on or about radio.

3•11 *What Almost Happened: Government Control*

The sometimes destructive competition between rival telegraph and telephone companies, the monopolistic trend in each field of communications due largely to economies of scale, the advantages of governmental control of wireless, the navy experiences during the war (see 2.61–2.62), and the example of many European countries—all led to a strong push for a government-owned-and-operated wireless system. In Europe, almost all telegraph and telephone systems were part of the postal service. In the United States, at the end of World War I, the belief recurred that Congress had made a wrong turn in the late 1840s when, after providing capital for Morse, it allowed the telegraph to revert to private hands (see 1.41 and 1.43).

Before the United States entered the war, an effort to establish government control reached Congress. An interdepartmental radio committee proposed, on November 21, 1916, revision of the Radio Act of 1912 to allow, among other changes, government stations to compete with commercial interests for purchase of private stations. The Marconi interests fought virtually every section of this proposed leg-

islation, but it was finally introduced into the House as the Alexander bill, after the representative who introduced it. Secretary of the Navy Josephus Daniels strongly urged its adoption as did, to the surprise of other amateur organizations, Hiram Percy Maxim, head of the American Radio Relay League and a noted inventor. Spirited debate arose over the provisions for limiting foreign ownership of any operating commercial company, with the Marconi interests objecting particularly. Their concern raised suspicions that Marconi *was* bent on establishing postwar dominance in the field.

Our entrance into the war, and the navy's assumption of operational control of all stations on April 7, 1917, lifted the pressure on Congress. However, one month after the Armistice, Secretary Daniels, still strongly favoring government ownership, helped to revive hearings on the Alexander bill before the House Merchant Marine Committee. But the navy had run into criticism for using wartime emergency powers to purchase the stations of the Federal Telegraph Company, some of the coastal Marconi stations, and installations in all seagoing vessels of American registry—through the Shipping Board. This criticism and the Republican congressional sweep in the 1918 elections sounded the death knell of the Alexander bill. Until he left office in 1920, Secretary Daniels continued to press for commercial use of navy-controlled stations or, failing that, at least making overseas radiocommunication from the United States a private monopoly in American hands, but the bill was tabled on January 16, 1919.

Furthermore, after the war, the navy not only suffered from a lack of trained operators and funds, but faced a strong and growing clamor for return of government-operated stations to their owners. This outcry, joined by amateurs,

as well as AT&T and Marconi, led President Wilson, on July 11, 1919, to order all seized stations returned to their owners as of March 1, 1920. The amateurs were allowed back on the air on October 1, 1919.

3•12 *The Birth of RCA*

The trigger that led to establishment of the Radio Corporation of America was the renewal of negotiations between British Marconi and GE over the Alexanderson alternator in March 1919, a bare four months after the end of World War I (see 2.21). It was the second round in a series of discussions that had begun in 1915. Marconi now offered to buy 24 large alternators, 14 of which American Marconi would use, for \$127,000 each—a vast sum for that day. This represented more than \$3 million worth of business to GE, which, like other firms, was then painfully adjusting to the end of wartime government spending. At that time GE had no interest in the communications business itself. The following month Marconi offered to pay an additional million dollars to compensate GE for development costs *if* GE, which would retain manufacturing rights, granted Marconi the exclusive right to buy the Alexanderson alternator. Because this machine was the best and most reliable transatlantic radio communication device known at that time, acceptance of the offer would give Marconi a monopoly on American radio communications with Europe.

Most Americans, whether or not they favored government control, deplored the idea of allowing a foreign company to control American communications facilities (see 3.11). When Owen D. Young, then head of GE's legal department, approached Acting Secretary of the Navy Franklin D. Roosevelt for the navy's view of the proposed Marconi contract, he found

strong opposition to the potential monopoly of any foreign firm.

Documentation of what happened next is sparse. Two American naval officers, Admiral William H. G. Bullard and Commander Stanley C. Hooper, known as the "father of naval radio," played a part in organizing governmental support for a "chosen instrument"; but their role apparently was insufficient to justify RCA's claim that the firm was organized in response to a government request. The architect of the scheme that finally resolved the Marconi contract and many other postwar problems (see 2.62) was Owen D. Young, later to become chairman of the board of GE. A genius at negotiation, Young persuaded GE's directors to buy a controlling interest in American Marconi. British Marconi sold its holdings without much fuss, since it was clear that Congress *would not* accept foreign control of communications and *would* accept an American "chosen instrument" in international radio communication, and since the navy still held the American Marconi stations. GE then bought out the holdings of American stockholders of American Marconi. This first block in the Young edifice gave GE control of most United States-based ship-to-shore and international radio stations as well as rights under existing Marconi contracts with ship operators. Marconi, in return, could now use the Alexanderson alternator for its own stations in the British Empire.

Since GE preferred the manufacturing business, it established the Radio Corporation of America in October 1919 to operate these stations. RCA's Delaware charter required that at least 80 percent of its stock be in American hands, that all officers be American citizens, and that the government have a representative on the board of directors to "present and discuss informally" the government's views. Ad-

miral Bullard, whom President Wilson appointed to the post, had little influence on corporate decisions, however. The unilateral placing of this provision in RCA's by-laws did not carry the same weight as it would have with a public corporation or quasi-official arm of the government organized or chartered by Congress. Young was named chairman of the board, and two former American Marconi officers, Edward J. Nally and David Sarnoff, became respectively president and commercial manager of the new firm. On the day of RCA's formation, GE and RCA signed a cross-licensing agreement calling for mutual use of each other's radio patents. A month later, GE transferred to RCA the tangible assets of what had been American Marconi, and the navy promptly turned over the former American Marconi stations.

RCA's primary role was to be an instrument of American policy in the international communications field. Some of its other roles did not come to light for several years, and the most important of these was the resolution of a decade-old conflict over patent rights for technology that included the triode vacuum tube.

3•13 *Patents Pooling: Westinghouse versus RCA*

At the end of the war, it looked as though the design and manufacture of radio apparatus would be set back several years as the navy program of indemnifying manufacturers against patent infringement suits came to an end and the advanced designs that had come from this period could no longer be used. Radio required the use of many patents, which were held by many individuals and companies. Amateur operators, however, could pirate these designs and techniques—with the exception of vacuum tubes and high-

powered transmitters—and build their own equipment fairly easily. They could get the few items that were hard to produce at home from small manufacturers, many of whom were rather lax about paying royalties. The greatest hindrance to the manufacture of advanced radio receivers was the unavailability of the triode, de Forest's Audion. De Forest controlled some rights to the third element, and he had sold some to Western Electric (AT&T) years before, but British Marconi still controlled the basic two-element tube, the diode or Fleming valve (see 2.21).

The pieces of this jigsaw puzzle fell into place when GE, RCA, and AT&T signed a further patents pooling agreement on July 1, 1920. Since AT&T, through its subsidiary Western Electric, had the right to use the third element of the triode, and since GE and RCA, through their purchase of Marconi assets, could use and license the patents for the diode, the cross-licensing agreement made the commercial sale of triodes legal for the first time.

What was Westinghouse doing all this time? GE's role was clear; it was the patron of RCA and the busy manufacturer of electrical and electronic apparatus. RCA not only operated overseas radio communications—primarily to Europe as the result of agreements with Marconi and various foreign post and telegraph administrations—but also managed a large and growing pool of important radio patents. AT&T retained the rights to use all patents necessary for the rental of radio and wire telephony service. Among other small companies, United Fruit had joined the patents pool, bringing in its crystal receiver and loop antenna patents in March 1921. But where was Westinghouse, one of the largest and most energetic electrical manufacturing firms in the world?

Although RCA-GE-AT&T had all the elements necessary to construct and

operate a profitable communications system, their patent situation did not give them a monopoly. At the end of the war there was still room for a communications system that did not rely on the RCA-GE-AT&T patents pool. Westinghouse, as a major competitor of GE, decided to fill that space in radio. The company had done considerable radio research and manufacturing during the war, and it owned many important patents. Westinghouse wanted to get into the international communications market, which, together with maritime radio, was considered the future profit center of wireless. It acquired control of the International Radio Telegraph Company, which had Fessenden's heterodyne and continuous-wave transmitter patents (see 2.2), as well as some useful foreign contacts, in May 1920, a few months after RCA's establishment. That summer, Westinghouse president Samuel M. Kintner traveled to various countries in an attempt to line up traffic agreements. He met great difficulties because of RCA's iron-clad agreement with British Marconi, and received cooperation only from a war-cowed Germany. Not yet discouraged, Westinghouse purchased the Armstrong regenerative and superheterodyne receiver patents in October 1920 for \$335,000 and arranged with the U.S. Navy for the non-exclusive use of a large block of important patents.

These patents included some German patents, which the navy had acquired from the custody of the Alien Enemy Property Custodian, and the very important patents for the Poulsen arc transmitter, which the navy had bought from the Federal Telegraph Company in 1917, when it looked as though Federal was going to sell to Marconi. This sale had some questionable aspects, with at least one historian pointing out its "suspicious circumstances," the subsequent suicide of one of

the chief actors and the resignations of several officials. The \$1.6 million purchase of May 15, 1918, gave the navy not only the Poulsen and other patents but a chain of high-power stations on the Pacific Coast.

Therefore, by late 1920, Westinghouse was in an excellent position to challenge RCA and its associates. It had an operating company, the Armstrong and Pupin patents, the Fessenden patents, rights to use the Poulsen arc and many other devices, the glimmer of a profitable receiving-set manufacturing business in conjunction with broadcasting stations (more on this in 3.2), and the possibility of beating RCA to a lucrative communications circuit or two. Yet, within nine months, Westinghouse gave up its independent course and joined the patents pool. Why?

The story may never be clear, but it appears that Westinghouse was neatly mousetrapped by RCA. On January 8, 1921, the Federal Telegraph Company, (which still existed as a corporation), entered into a contract with the Chinese government to build stations in China to communicate with a high-power California station. By some means, Federal persuaded the navy to return the Poulsen patents on March 19, 1921—with no exchange of money—so that it could construct these stations. Apparently, the government considered \$1.6 million a worthwhile price for three years' use of Federal's stations and patents, without concomitant infringement suits, and for the retained right to use the patents in question and any later ones developed by Federal. But once it had returned the patents to Federal, the navy could no longer grant Westinghouse a license to use them. Perhaps by coincidence, only a few months later, in December 1921, David Sarnoff wrote the government that RCA was "ready to cooperate with and assist" Federal in its

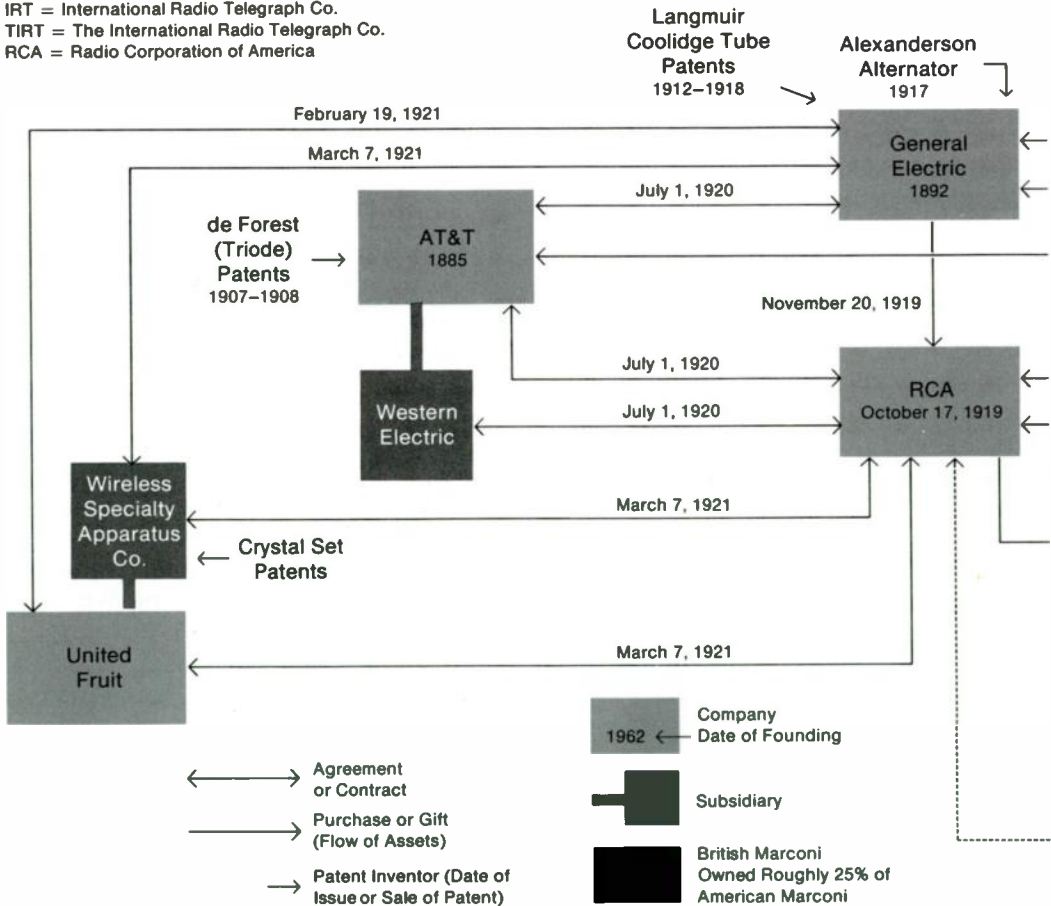
project. This move led to the establishment, in September 1922, of the Federal Telegraph Company of Delaware, which was organized so that RCA could take over the contract with China and, as a matter of fact, control the Federal Telegraph Company of California—and the Poulsen patents.

A major corporation such as Westinghouse does not survive by making mistakes or moving slowly. Then again, the entire gambit by Westinghouse may have been nothing more than a strategem devised by its patent chief Otto Schairer, later to hold the same post at RCA, to ensure that Westinghouse would enter the patents pool on as favorable terms as the original members. Within six months after Federal's repossession of the Poulsen patents and long before RCA overtly took charge of Federal's activities, Westinghouse quietly joined RCA, AT&T, and GE in a patents pooling agreement. The International Radio Telegraph Company's business was absorbed into RCA on June 30, 1921, the same day that RCA concluded its cross-licensing agreement with Westinghouse.

Who won? The infant radio manufacturing industry did. The American people, tired of waiting for the squabbling over patent rights to subside, probably won as well—RCA finally fitted together the last sections of "Owen D. Young's famed jigsaw puzzle." GE could now manufacture, and RCA sell, radio receiving sets for the general public, using Westinghouse's Armstrong patents and demonstration of a market for them. AT&T could manufacture transmitters and use radio telephony in its domestic business. The navy could breathe more easily and deal with one company instead of several. Westinghouse, in 1922 the second largest participant after GE, controlled 20.6 percent of RCA's common and preferred stock com-

The Origins of the Patents Pool: 1919–1922 / See the text for discussion of the motivations of the participants. In essence, GE bought American Marconi at the instigation of naval officers, in April 1919, in order to found RCA as a “chosen instrument” of American overseas communications. GE, RCA, and AT&T formed a patents pool, bringing in United Fruit and others not shown on the accompanying chart. Westinghouse attempted to compete head on with RCA using purchased patents and other patents obtained nonexclusively from the navy. The navy had acquired some of these from the Alien Enemy Property Custodian during World War I, and some, the Poulsen arc patents, purchased along with several stations from Federal Telegraph of California. In returning the stations and the patents to Federal without payment shortly after Federal contracted to establish radio links between the United States and China, the navy automatically restricted Westinghouse from using them. RCA agreed to “cooperate” with Federal, later establishing Federal Telegraph of Delaware as a subsidiary. Westinghouse, now without transmitter patents and prevented by RCA–British Marconi relationships from establishing competing traffic agreements with many countries, joined the patents pool in June 1921, in a relatively strong position thanks to its ownership of the Armstrong patents and its early commitment to domestic radio broadcasting.

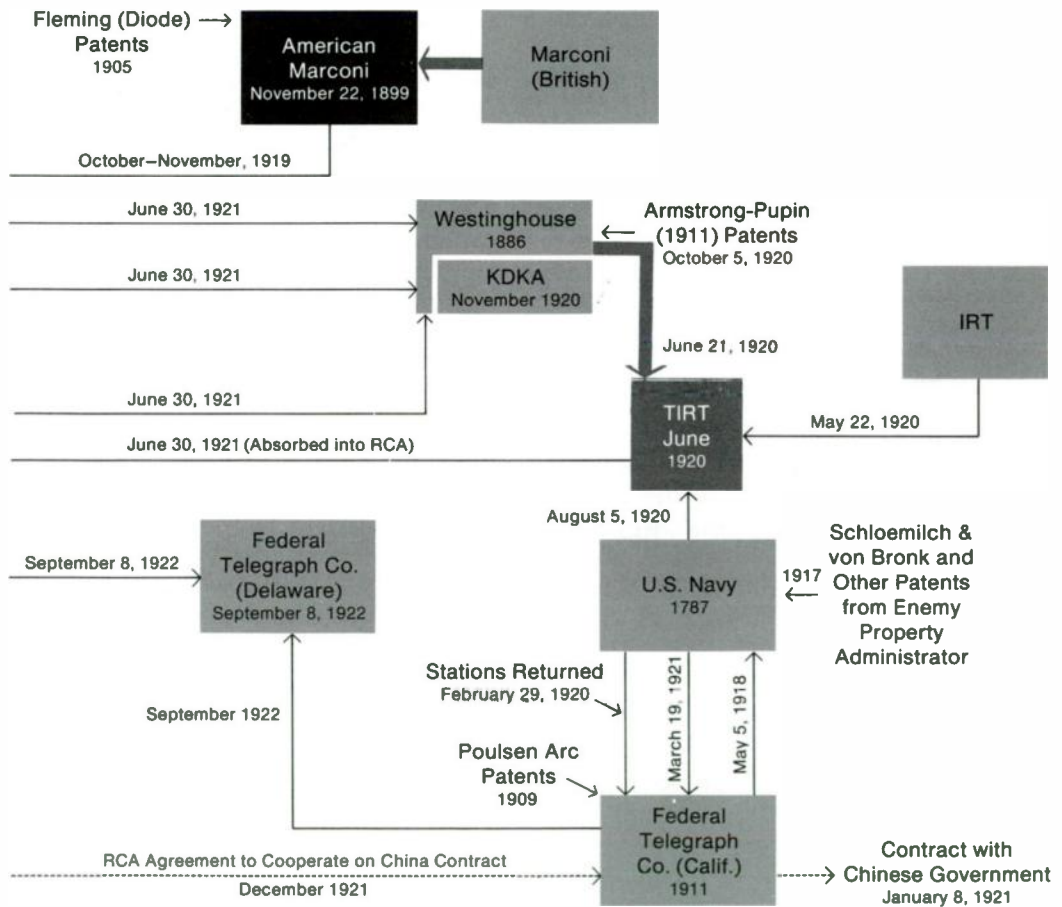
AT&T = American Telephone and Telegraph Co.
 IRT = International Radio Telegraph Co.
 TIRT = The International Radio Telegraph Co.
 RCA = Radio Corporation of America



The patents pool agreements established the following division of functions, among others, until the participating companies modified or abrogated the agreements in the mid-1920s:

- a. Each of the major participants (RCA, GE, AT&T, Westinghouse) could build equipment for its own use, including broadcasting transmitters.
- b. AT&T could sell broadcast transmitters to outsiders, and reserved the right to use radiotelephony for hire.
- c. GE and Westinghouse could manufacture radio receivers and supply them to RCA, which acted as sales agent (GE built approximately 60 percent, Westinghouse 40 percent).
- d. RCA would administer the patents pool, collecting royalties from outsiders.
- e. RCA would also operate all maritime and transoceanic radio communication for hire.

(It was not until several years later that RCA was allowed to manufacture receivers and engage in broadcasting and networking in its own name.)



pared to 25.8 percent for GE, 4.1 percent for AT&T, 3.7 percent for United Fruit, and 45.8 percent for other owners including the general public and former American Marconi shareholders. According to agreements with both GE and Westinghouse, RCA would be the sole selling agent for the manufacturing firms' radio receivers and would take approximately 60 percent from GE and 40 percent from Westinghouse. Nearly two thousand patents were pooled. Everyone was to have a piece of the action in the field of radio as it was then understood—the field of international, maritime, and amateur radio. The signers did not realize that the development of radio *broadcasting* to the general public would make the patent agreements uncomfortably binding within only a few months.

3•2 The Pioneer Stations

In 2.5 we tentatively honored Fessenden for delivering the *first broadcast* in America and Herrold for maintaining the *first broadcasting station* with a regular schedule of programs. However, a controversy remains as to which is the *oldest* broadcasting station in America; depending upon the definitions and the data accepted, there are several legitimate candidates. Our criteria for making this determination are that a broadcasting station must (1) utilize radio waves, (2) to send noncoded sounds by speech or music, (3) in the form of a continuous program service, (4) intended to be received by the public, and (5) if after 1912, be licensed by the government. The *first* station is the one that had all these characteristics at the earliest date, although the *first broadcast* needn't meet the third criterion. The *oldest* radio station is the one *presently operating* that met all five criteria at the earliest date.

3•21 The Oldest Stations

Fessenden's 1906 transmissions fit our definition of the first true broadcasts but did not meet the third criterion. It was Herrold's continuous service of music and voice to the general public—at least to the extent of supplying receivers for hotel lobbies—that earned the distinction of "first station." Determining the oldest station is more difficult.

A lack of data and a question of definition place Herrold's station KQW in San Jose, now KCBS in San Francisco, in an ambiguous position. Although "Doc" Herrold started in 1909 and was broadcasting one night a week regularly by 1912, his station had a substantial gap in service during *and after* World War I. Our criteria should tolerate a short-term suspension of service, technical failures, "acts of God," and other matters outside the station operator's control; and the wartime closing of amateur stations in 1917 could be considered in this light. However, despite the present operators' claim that the station returned to the air "very shortly" after the war (amateurs were on the air as early as October 1, 1919, and stations seized by the navy were returned on March 1, 1920), their documentation is not adequate. Licenses for experimental stations 6XE and 6XF were issued to Herrold in mid-1920, but there is no evidence that he *broadcast* anything over these stations, and, indeed, although KQW received a regular broadcast license on December 9, 1921, there is no record of the station having gone on the air until a month later than that.

Professors Earle M. Terry and Edward Bennett, and others, were issued licenses for 9XM to operate at the University of Wisconsin at Madison before World War I. After 1915, this station (now WHA) was licensed to the university. Providing radio-*telegraphed* weather reports and commu-

nicating with the navy's Great Lakes Training Station, 9XM was one of the few to stay on the air during much of the war. Although it may have transmitted by radiotelephone as early as February 1919 to Great Lakes, broadcast service apparently started between September 29, 1920, and January 19, 1921—almost certainly toward the end of this period, since Professor Terry wrote the Federal Radio Commission in 1928 that KDKA (see below) antedated 9XM "by a few months."

There are numerous other claims to the title of "oldest station in the United States," each with its supporters. Some are little known: KQV, Pittsburgh, overshadowed by KDKA, has never pushed for recognition. WRUC, Union College, according to a 1970 article, signed on on October 14, 1920; however, it no longer uses radiation to serve its campus-limited audience. Some claims are for foreign stations: CFCF in Montreal, Canada, and PCGG in the Netherlands both claim November 1919 as their starting date. Some rely upon variations in the definition of broadcasting: WEAJ, New York, did not go on the air until 1922 but was the first broadcasting station to go *commercial* by selling time (see 3.5). WBZ, Boston, which took to the air in September 1921, was erroneously listed as the first station to receive a "broadcasting" license from the Department of Commerce—evidently because its licensing coincided with the adoption of a new classification system.

KDKA, Pittsburgh, and WWJ, Detroit, both backed by large corporations, have jostled for years over the primacy title. Since both stations apparently went on the air in 1920, they antedate most other claimants as continuing broadcasting services as such and not as adjuncts to wireless experimentation.

KDKA started as a prewar, 1916 amateur experimental station licensed to

Dr. Frank Conrad, a Westinghouse engineer. When the war ended, Conrad was able to reopen station 8XK quickly—probably between June 15 and August 1, 1919—since during the war he had operated a station from his home in connection with designing equipment for the navy. On October 17, 1919, Conrad delighted and amazed hams for miles around when he placed his microphone before a phonograph—an act that not only spared his voice but apparently initiated postwar broadcasting. Amateurs and war veterans trained to build and operate radio receivers wrote him so many requests for musical selections that Conrad decided to broadcast a program of records for two hours each Wednesday and Sunday evening instead of trying to comply with single requests. He sometimes added talks, sports scores, and live vocal and instrumental renditions by his young sons.

Late in the summer of 1920, growing interest in these broadcasts led the Joseph Horne Company, a Pittsburgh department store, to advertise amateur wireless sets for \$10 and up on which to listen to Conrad's station. This ad struck the eye of H. P. Davis, Westinghouse vice president, who was eager to establish a postwar market for the company's radio manufacturing capability. At an executive meeting on September 30, 1920, Davis suggested that Westinghouse build a station and advertise and broadcast a program every night so that people would acquire the habit of listening. He observed that if there were sufficient interest to justify a department store in speculatively advertising radio sets for sale, there would probably be sufficient public interest to justify the expense of rendering a regular broadcasting service, looking both to the further sale of receivers and promotion of the Westinghouse Company name as return for the costs of broadcasting. An

application to this effect was filed with the Department of Commerce on October 16, and the license for KDKA was issued 11 days later.

The first broadcast, held on election night, November 2, 1920, came from a 100 watt transmitter in a tiny makeshift shack atop a Westinghouse manufacturing building at East Pittsburgh. Conrad was not there; he was at home, standing by with 8XK in case KDKA's new transmitter failed to work properly. The election returns, courtesy of a telephone connection with the *Pittsburgh Post*, were broadcast to an estimated few thousand listeners, including some people at a Pittsburgh country club, over Westinghouse-supplied loudspeakers. The broadcast started at 6 p.m. and continued until the following noon, even though candidate James M. Cox had earlier conceded the presidential election to Senator Warren G. Harding. The next evening KDKA broadcast only from 8:30 until 9:30. The transmitter soon was relocated and increased in power, but the studio remained on the roof for months in somewhat more spacious, airy, and sound-controlled quarters: a tent. When the tent blew down in a gale, it was re-erected inside, providing the necessary acoustic control.

In Detroit, amateur station 8MK went on the air on August 20, 1920, with voice and phonograph music, from a makeshift "radio phone room" on the second floor of the *Detroit News* building. The Radio News and Music Company, formed by associates of de Forest to sell his radio equipment, held the license. Although the *News*, a Scripps paper, apparently financed the broadcasts, it gave them no mention for days. On October 15, 1921, a broadcasting license with the call letters WBL, changed to WWJ on March 3, 1922, was issued to the *Detroit News*.

The preceding accounts suggest

the great difficulty of comparing and adjudicating conflicting claims. As to *broadcasting* licenses, KDKA led WBL (WWJ) by nearly a year. Conrad's *amateur* station, 8XK, successor to the prewar station, went on the air more than a year before 8MK and was broadcasting music ten months earlier. As to license-holding, in either case Westinghouse or one of its officers held a license before the *Detroit News* did. Only by maintaining that 8XK is *not* the precursor of KDKA, *and* that 8MK is the precursor of WWJ, can one uphold WWJ's claim—and both Conrad's status as a Westinghouse employee and the *News's* delay in applying for a broadcasting license belie that position.

Radio broadcasting appeared to grow slowly for the first year or so after

Early Radio Announcer / One of the first full-time radio announcers was Harold W. Arlin of station KDKA, shown here as he broadcast in the early 1920s—complete with tuxedo, then almost mandatory for evening announcing duties. He did the first play-by-play sports and introduced many noted personalities in their radio debuts. Photo courtesy of Group W and Broadcast Pioneers Library.



KDKA went on the air. By January 1, 1922, the Department of Commerce had authorized only 30 broadcasting stations; and only 100,000 receivers were sold during 1922. However, the statistics are misleading. Hobbyists made many thousands of receivers, since a crystal set was inexpensive and could be put together easily, while thousands of war-trained radio experts produced advanced equipment. Some stations with amateur licenses broadcast regular programs of speech and music. By May 1, 1922, the *Radio Service Bulletin* of the Bureau of Navigation, Department of Commerce, listed 218 stations "broadcasting market or weather reports, and music, concerts, lectures, etc," many of them on the air only a few hours a week. By March 1, 1923, the number had climbed to 556, and in that year 550,000 radio receivers were produced commercially, with an average retail value of \$55 each. The boom was on.

Westinghouse was the first company to move decisively into radio broadcasting, characterized up till then by the haphazard operations and unreliable equipment of hobbyists and amateurs. In September 1921, when KDKA was on its feet, Westinghouse opened WBZ, Springfield, Massachusetts, and WJZ, Newark, New Jersey, although they were licensed on different dates. In keeping with KDKA's makeshift quarters, WJZ started out in a curtained-off section of the ladies' lounge at the Westinghouse plant in Newark. This first station in the New York area later became the key station of the Blue Network. WBZ moved to Boston in later years and for some time operated station WBZA in Springfield *synchronized* on the same frequency. Westinghouse also established KYW in Chicago, which after several shifts now is located in Philadelphia, and stations in Hastings, Nebraska (a remote-controlled *repeater* station duplicating the

KDKA signals), and Cleveland. Many Westinghouse officials enjoyed being associated with broadcasting, but the company backed these ventures chiefly to spark public interest in receiver sales. But by 1972, little less than sixty years after H. P. Davis had noticed that advertisement for a radio receiver in a Pittsburgh newspaper, Westinghouse was no longer making radio receivers domestically. On the other hand, its broadcast operations—known as "Group W" and including KDKA (AM, FM, TV, Pittsburgh), KYW (AM, TV, Philadelphia), WBZ (AM, FM, TV, Boston), WINS (AM, New York), WIND (AM, Chicago), KPIX (TV, San Francisco), WJZ (TV, Baltimore), WOWO (AM, Fort Wayne), and KFWB (AM, Los Angeles)—were still going strong.

RCA delayed entering domestic radio broadcasting until it had set up the international communication links for which it had been established. The company's first broadcasting facility, WDY, went on the air on December 14, 1921, from the General Electric factory in Roselle Park, New Jersey. Its transmitter was one that RCA had installed, under the call letters WJY, for one night for a blow-by-blow account of the Dempsey-Carpentier heavyweight boxing championship match on July 2, 1921 (see 3.64). The estimated 200,000 listeners were lucky, for the transmitter burned out only a minute or so after the end of the fight. Even with 500 watts of power, a high output for the day, WDY was too far—approximately 16 miles—from New York City to attract live talent of any stature. Also, music from records played at home on an acoustic, spring-powered phonograph would have been probably cheaper and certainly more enjoyable than WDY's static-ridden transmission through earphones. WDY lasted only until February 24, 1922, when RCA agreed to share half the operating expense

of Westinghouse's better-located and better-engineered WJZ.

General Electric also entered the broadcasting business, a bit behind its partners in the patents pool. Like Westinghouse, its original purpose was to encourage the sale of radio receivers. Its first station, WGY, operated from the GE plant at Schenectady, New York, with 1,500 watts of power when it first went on the air on February 22, 1922. With favorable atmospheric conditions, the well-engineered station was able to reach the Pacific Coast and England. Such ranges were not uncommon, even with relatively low power, when there were few stations on the air to cause degradation of the signal; even WDY could be heard as far west as

Omaha. GE also founded KOA in Denver and KGO in Oakland. In 1977, it still owned AM, FM, and TV stations in Schenectady, Denver, and Nashville.

3•22 Boom (1922–1925)

By 1922 the country was afire with radio fever. More than 600 stations went on the air that year, but many went off again in a few months, weeks, or even days. Of the survivors we can identify many by their three-letter call signs (KYW, WHN), although some of the earliest had four letters (KDKA). The initial letters of call signs had been assigned by international agreement in 1912, with W, K, A,

Who Were the Early Broadcasters? / As noted in 3.22, a radio station was seldom the primary concern of early broadcasters. It was nearly always an arm of some other business or activity, often promotional but mostly noncommercial. The best tabulation was done by the Department of Commerce as of February 1, 1923.

Type of Owner	Number of Stations	Percentage of Total
Radio and electrical manufacturers and dealers	222	39%
Educational institutions	72	13
Newspapers and other publications	69	12
Department stores	29	5
Automobile, battery, and cycle dealers	18	3
Music, musical instrument, and jewelry stores	13	2
Churches and YMCAs	12	2
Police and fire departments, and cities	7	1
Hardware stores	6	1
Railroad, power, and telephone companies	9	1
Other commercial businesses	19	3
Other and unknown	100	17
	576	100%

Source: U.S. Department of Commerce, *Radio Service Bulletin* (February 1, 1923), as reprinted in Banning (1946), pages 132–133, and adapted herein.

and N going to the United States. By custom, and later by rule, W belonged to broadcasting stations east of the Mississippi and K west, although there are a handful of exceptions (see Appendix B). Radio and electrical manufacturers and dealers, ranging from giants like GE and Westinghouse to one-man repair shops in small towns, owned by far the largest number of stations.

Most station licensees spent little money on broadcasting operation, because few could expect any direct return. The manufacturing companies, and many dealers, provided the program service to sell sets. Department stores owned a station as a publicity investment; although it wasn't advertising, the simple announcement of ownership or location was worth the cost. Virtually all the stations that went on in 1921 and 1922 were operated as a side line. Licensees were seeking publicity, fun, or prestige in the community. Educational institutions used radio as an extension service or a physics department laboratory. Churches and other crusading organizations were early operators of radio. Newspapers built stations so as to keep up with new entertainment and news technology, for publicity, and as a symbol of their perceived public service role.

These early stations were primitive. Many operated from hotels, trading publicity for free room; but, since the hotel often was the tallest building in town, at least it was thought then to be an excellent location for antenna towers. Most studios had little equipment. A piano was a must, as was a microphone. Burlap served as sound control for years. Volume control and mixing were not yet available and phonograph records were played on a conventional acoustic phonograph with a microphone stationed before the open doors. At first, almost all transmitters were hand-made, with indifferent results. Lack

of volume controls and limiting devices made it possible for an opera singer to blow out a tube and throw the station off the air. Carbon telephone-type microphones tended to "freeze up" when very loud sibilant sounds were spoken into them.

Many transmitters of the early 1920s usually radiated less wattage than one studio light. Within a few years, most stations were rated from 100 to 500 watts, although about 15 were as high as 1,000 watts and five or six were "high power," running 5,000 watts. Such amounts of transmitter power were satisfactory when only a few hundred stations were on the air. A 100 watt station of the middle 1920s would send a reliable signal out 20 to 50 miles, a feat that today—with approximately 4,500 transmitters on the standard (AM) broadcast band in the United States—would take many times as much radiated power. Because receivers had low sensitivity and often poor quality, broadcasters kept asking the Secretary of Commerce, the licensing authority, for *super-power* that would enable them to deliver a clearer signal to more people. Late in 1925, WGY experimentally broadcast with 50,000 watts. Of course, if *everyone* had higher power, interference would remain—and at a higher level.

As broadcasting stations went on the air in large numbers, they also went off. For example, in just five months of mid-1923, 150 stations left the air. Their failure was financial rather than technical. When a station had been on the air for some time, and its novelty had worn off, the licensee became more concerned about its cost. Although electrical current for low-power stations was not very expensive, transmission tubes and other parts were. The station needed consistent sources of programming, and record stores soon tired of lending or giving records in exchange

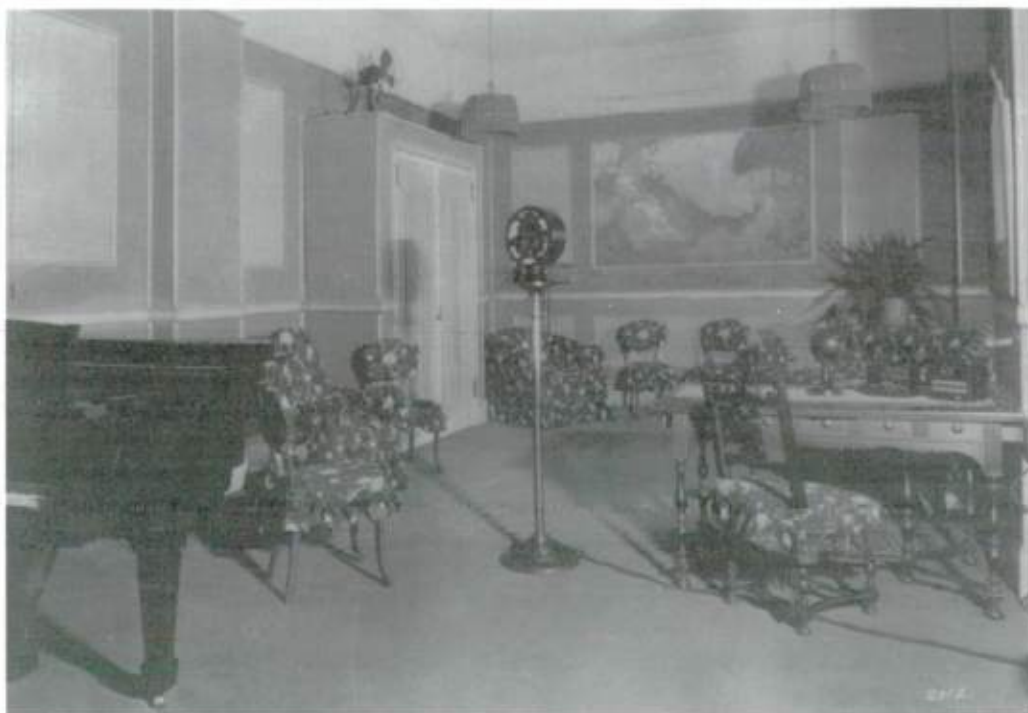
Early Radio Studios / Early radio studios reflected their times: chintz furniture, plants, the almost required piano—and draped walls to improve acoustics. The announcer and piano player appear in KDKA's inside studio at Christmas of 1922; the second draped studio is Westinghouse's WBZ in Springfield, Massachusetts, in 1922 (note the record player, used for music to fill between live presentations); and the third picture shows a large-station prestige studio from sometime in the 1926–1928 period. In all cases the studios are fairly large and have many chairs for performers to sit on while waiting to broadcast.



Courtesy of Group W and Broadcast Pioneers Library



Smithsonian Institution Photo No. 76-14663



Smithsonian Institution Photo No. 76-14657

for an occasional plug. Talent began demanding payment for their time or effort. It became clear that, if broadcasting were to become more than an adjunct to another enterprise, it had to have a direct source of income. In June 1922, RCA's David Sarnoff proposed a nonprofit broadcasting company supported by a 2 percent tax on receiver sales, but his idea got nowhere.

Nevertheless, people were starting to listen to radio for its content and not for its novelty. Although homemade receivers, typically crystal sets requiring minimal construction skill and no power, were still common, more and more persons purchased ready-made receivers. For example, in the summer of 1923, Gimbel Brothers department store in New York purchased from RCA 20,000 Westinghouse receiving sets with a retail value of at least \$3 million. The total value of sets sold in 1923—excluding tubes, which were sold separately—was between \$30 and \$45 million, a figure that increased to approximately \$100 million in 1924. The average retail value of sets climbed steadily from \$50 in 1922 to over \$135 in 1929. More than 4.1 million sets were manufactured commercially between 1922 and 1925.

By 1925 the growth of radio began to create problems. In major cities there were too many stations on a limited band for good reception (see 3.8)—for instance, 23 in Los Angeles and 40 in Chicago. Receivers were unselective; transmitters tended to drift. With the limited spectrum space and equipment available, the typical large city could accommodate only seven stations without resorting to *share-time* operations. In Los Angeles and Chicago, share-time might allow a single station as little as one hour or two of air time daily, divided into widely separated parts of the day. With four or five stations using the same channel, no one of them could build an audience. Because many of their lis-

teners were DX fans, who listened for distant stations, some cities designated "silent nights," when local stations signed off early to improve distance reception.

3·23 *Conflict: Radio Group versus Telephone Group*

Although interference between stations was the conflict most apparent to listeners, it became less important in the early 1920s than the issue of financial support. Broadcasting was not considered when the original patents pool agreements were signed. Since no money was expected at first from broadcasting operations, Westinghouse, GE, and RCA all built stations without worrying about the agreements. After assuming control of WJZ in 1923, RCA opened another New York station, WJY, and moved them both to Aeolian Hall—WJZ with a light, popular format and WJY with a "quality" program of talks, music, and education. By this time, RCA was spending approximately \$100,000 a year to maintain its three stations, now including WRC in Washington, without any direct income from them. Westinghouse was not far behind in outlay.

It remained for AT&T to find a way to make radio broadcasting pay. In the original patent agreements, AT&T had reserved the right—the sole right, it claimed—to use radio telephony for hire. In July 1922 it built station WBAY in New York, only to discover through error that the location of a transmitter in a large steel-frame-building-lined city negatively affects reception decisively, and that this kind of engineering is an art, not a science. AT&T's second attempt was successful. WEAf, equipped with the best studio apparatus and an excellent transmitter, received much praise after it went on the air on August 16, 1922.

AT&T was now ready to move. Under the 1919-1921 patent agreements, what became known as the Telephone Group—essentially, AT&T and its manufacturing subsidiary Western Electric—held that it had the *exclusive* right to (1) manufacture and sell radio transmitters for broadcasting, (2) sell time for advertising, named *toll broadcasting* in a parallel to toll or long-distance telephone calls, and (3) interconnect stations by wire for network or chain broadcasting. In each of these matters it had to contend with the opposed corporate goals of the Radio Group—GE, RCA, and Westinghouse.

Although AT&T's legal grounds with respect to the first point were excellent, the company actually lost in the court of public opinion. When station WHN (New York) settled out of court in the winter of 1924, agreeing to pay AT&T \$4 per watt of power over the life of the patents, whether or not Western Electric had made the transmitter, it was merely acknowledging a hopeless legal position. But to the public, already disturbed at the growth and power of trusts and cartels, AT&T seemed to be jumping with hobnailed boots all over the little fellow.

The second point burst like a skyrocket over the radio scene when WEAf, shortly after going on the air, offered to sell time by the minute to whoever wished to use it (see 3.5).

The third point became increasingly important between 1923 and 1926 as the Telephone Group interconnected its affiliated stations with Bell System wires, engineered to carry music as well as voice, while the Radio Group had to make do with inferior Western Union circuits. Of course, AT&T received no revenue from the Radio Group when they used other circuits, but the poor voice quality over Western Union telegraph wires caused the Radio Group to lose much public favor.

Throughout the history of American broadcasting, AT&T's role in interconnecting stations has been an important one. When broadcasters objected to high AT&T video connection rates in the late 1940s and boycotted Bell System facilities, they found themselves turning again to Western Union lines for local loops if not for intercity circuits. One program was involved both times: the six-day bicycle races from Madison Square Garden in New York (see 7.32).

Stations that took out transmitter licenses from AT&T were generally able to sell advertising time and afford interconnections by telephone lines. Few stations, however, were willing to pay a high price for what might be an unprofitable business. After the WHN case, many stations capitulated, but others went off the air or hoped that they were small enough for AT&T to overlook.

The Radio Group maintained (1) that only the firms in the patents pool (see 3.12 and 3.13) had the right to make and sell radio receivers to the public, (2) that any station could at least recoup program costs from sponsors, and (3) that stations could be interconnected by any means available. RCA sued the A.H. Grebe radio company in support of the first point and won an important legal precedent: manufacturers had to take out licenses from RCA in order to make many receiver parts. The royalties ran high—in 1927, for example, at 7½ percent of the net selling price, including cabinets. RCA granted licenses solely to larger customers and even limited these purchases to relatively inefficient circuits—for which, of course, they had to buy RCA tubes. The royalty situation—as well as poor management, inadequate sales promotion, and rapid development of newer and better designs—drove many manufacturers out of business. Of the 748 radio manufacturing companies estab-

lished between 1923 and 1926, only 72 lasted until 1927, and only 18 of these survived the Depression into 1934. As for the second and third points, a certain degree of fuzziness existed in application. Although some stations were able to sell advertising time for cash, most simply traded air time for products or services. As noted above, the Radio Group tried to meet the question of interconnection head-on.

Throughout the period from 1922 to 1924, attempts were made to reconcile the differences between the two groups. As the fight grew hotter, AT&T sold its RCA stock, although it remained a member of the patents pool. In 1923, Congress, concerned over RCA actions against Grebe and others, ordered the Federal Trade Commission to investigate RCA for violation of the antitrust laws. Clearly, RCA no longer had the image it had had in 1919. The FTC report of 1924, which examined manufacturing, international communications, and the role of radio, resulted in complaints against seven companies besides RCA. This proceeding dragged on for six more years (see introduction to Chapter 4).

In 1925 the Radio Group and the Telephone Group agreed to binding arbitration. After months of hearings, the arbitrator decided nearly all issues in favor of the Radio Group position. As a result, the telephone company's lawyers announced that since the 1920–1921 agreements must have been illegal to have given RCA such a monopoly, AT&T would have to withdraw from them. With the prospect of putting the patent hassle back six years, both sides tried again to agree on what the words written in 1920 meant in the radically changed world of 1925.

Early in 1926 the stalemate was broken with an involved, three-part agreement that clearly settled the functions of the telephone and radio interests. First,

the license or patents pool agreement was redefined in light of the realities of the broadcasting industry of 1926. Second, AT&T received a monopoly of providing wire interconnections between stations. Third, AT&T sold WEAf to RCA for \$1 million and agreed not to re-enter broadcasting as a station owner for eight years, under penalty of having to refund part of the price.

Not only had AT&T wearied of the battle, but such a competitive business did not fit its longstanding corporate philosophy. This philosophy favored monopoly, such as it had in long-distance telephony, over head-to-head competition—which it really didn't have to face until the 1970s. AT&T also favored the cautious introduction of technological innovations (see 1.13). In addition, many Bell executives were disturbed to see time, effort, and money going into entertainment and other broadcasting instead of the point-to-point communications business on which the firm was based.

3.3 The Start of Networking

The idea of connecting two or more stations for simultaneous broadcast of a program probably existed from the start of broadcasting. In this way a given message could reach a far larger audience, at reasonable cost, than from a single station. The earliest known efforts at relaying a program were *remote* reports from sports events sent back over telephone lines, sometimes from a distant city. True chain or network broadcasting started on January 4, 1923, when telephone circuits connected WNAC in Boston and WEAf in New York for a five-minute saxophone solo originating at WEAf. Although generally satisfied with the experiment, AT&T engineers knew that substantial improve-

ments in their lines would be necessary for the regular transmission of music.

In June 1923, WEAf (New York), WGY (Schenectady), KDKA (Pittsburgh), and KYW (then in Chicago) were connected for a special program on the anniversary of the electric light. A month later, the first "permanent"—more than one program—chain was established when WEAf piped programs to WMAF, a South Dartmouth, Massachusetts, station owned and supported as a public service by eccentric millionaire E. H. R. Green, who picked up the bill for three or four hours a day of New York programming.

The WEAf group made ambitious plans for nationwide broadcasting of Warren G. Harding's speeches during the summer of 1923, but the President's illness and death abbreviated the effort. President Coolidge's first message to Congress, on December 4, was heard over a number of stations as far away as Missouri and Texas. Radio covered both political conventions of 1924, and AT&T was building a permanent hookup connecting Washington, New York, Providence, Buffalo, Pittsburgh, and Chicago. On October 24, 1924, President Coolidge spoke to the U.S. Chamber of Commerce in Washington—and to the United States through 22 stations from coast to coast. When Coolidge was inaugurated the following March, 15 million people heard the ceremony over 24 stations. By this time, WEAf (AT&T) had an operating network of more than 20 stations, and the WJZ (Radio Group) network, concentrated in the East, was much smaller. Advertisers were interested in these networks, but they were more engineering and programming devices than sales organizations.

Although telephone lines were the best medium for interconnecting stations, other techniques were tried. Westinghouse used shortwave transmissions in

1923–1924 to connect KDKA with satellite stations KFXX in Hastings, Nebraska, and KDPM in Cleveland. Amateur radio operators had opened up the shortwave spectrum, earlier thought useless, and had even sent a signal across the Atlantic in 1921. With higher shortwave power, KDKA relayed programs in the winter of 1923–1924 to a station in Manchester, England, for rebroadcast. This followed an ambitious experiment during the last week of November 1923, when stations in Great Britain picked up about fifteen American stations using their regular medium-wave transmitters.

Another interesting network experiment was a precursor of cable television. Early in 1923, a company in Dundee, Michigan, offered subscribers a wired radio system, providing programs from several stations for \$1.50 a month. In Europe and the Soviet Union, earlier rediffusion systems such as the Puskás brothers' Telephonic Newspaper in Budapest (see 2.5) were a major technique for aural dissemination, but they never caught on in America.

3-4 Early Educational Broadcasting

The prospect of educating larger numbers of people attracted universities and colleges to the radio fad in 1921 and 1922. They first established stations as informal laboratories for engineering schools and physics departments or strictly for publicity. Even before World War I, radio telegraph and some radio telephone experimentation had taken place at colleges and universities such as Arkansas, Cornell, Dartmouth, Iowa, Loyola, Nebraska, Ohio State, Penn State, Purdue, Tulane, Villanova, and Wisconsin. Afterward, many of these stations and many new ones went on the air: New York University,

Nebraska, and Tufts were among the schools that offered extension courses by radio in the early 1920s. A few others tried to use radio for fund raising without much success; land-grant colleges, in particular, offered adult education, primarily in home economics and agriculture. Of the more than 200 stations licensed to educational institutions in the early and middle 1920s, 72 were on the air in 1923 and 128 in 1925.

Noncollege broadcasters also scheduled educational programs in the form of "radio schools of the air," lectures, and even courses for credit. WJZ began such broadcasts in 1923. WEAF followed, and WLS in Chicago began its *Little Red Schoolhouse* series in 1924.

3•5 The Problem of Financial Support

The primary problem that broadcasters faced in the early 1920s was how to pay for programming. Stations struggled along as adjuncts to other enterprises or as hobbies. David Sarnoff, whose proposal for a "radio music box" was so prescient, suggested having a 2 percent tax on receiver sales. In 1924, New York businessmen formed a committee to solicit funds from the radio audience for the hiring of high-class talent for WEAF. This effort failed partly because the fractionated radio audience distrusted such a benefit to the AT&T station. The idea of voluntary audience contributions to a common fund controlled by an elected or appointed board also failed. Another gimmick was for a station to establish an "invisible theater of the air," in which the audience could "buy seats." One New York station tried to gather \$20,000 in this way but gave up and returned the contributions when it could collect only \$1,000. This idea still survives: some stations sell printed program schedules to augment income, and many public

television stations and a few radio stations, such as the Pacifica Foundation group, depend largely upon audience donations.

One approach that was not tried in this country became the standard practice abroad: levying an annual tax on radio receivers for the support of broadcasting authorities or companies. In this way, the audience supported the programming by buying and using sets, and the government, as collector and distributor of fees, had a say in the programming. In America a few municipalities and states have used general tax revenues to support broadcasting stations such as New York City's WNYC, but the national approach never took hold—perhaps for fear of governmental control of content, belief that free enterprise should determine radio operation, or dislike of taxation in general. (Current discussions over the financing of public television reflect these discussions and debates of the 1920s.)

The financial technique that eventually succeeded was direct advertising—the purchase of time from a station for the presentation of commercial messages. The first *commercial*—so named from AT&T accounting practices—lasted for 10 or 15 minutes on WEAF in the early evening of August 28, 1922. It was a pitch by the Queensboro Corporation for a cooperative (similar to a condominium) apartment house complex in Jackson Heights, a section of New York City recently opened up by a new rapid transit line. A salesman for the company, which owned most of Jackson Heights, referred briefly to author Nathaniel Hawthorne, namesake of the apartment house, and devoted the rest of the broadcast to a sales talk very much like today's offerings of land in Florida or Arizona. This broadcast, which probably took up less than the allotted time, cost \$100; it was repeated for five days, and then

again a month later. Several thousand dollars in sales were reported.

Tidewater Oil and American Express also bought time in those first weeks, but after two months WEAF had sold only three hours and collected \$550. As with television two decades later, only a few far-sighted firms—including a department store, a political organization, and a motion picture producer—saw the great potential of radio as an advertising medium in those first four months when the station realized a net income of only about \$5,000. By 1923 Gimbel's department store and other advertisers had begun sponsoring entertainment programs.

Some other stations, adopting this means of recouping expenses, ran afoul of AT&T's policy of exacting additional royalties for the use of radio telephony for hire. By the end of 1925, about half the stations on the air paid these royalties, which were part of the transmitter royalty payment and ranged from \$500 to \$3,000 in a lump sum.

These stations soon developed pricing policies geared to the market. Important stations in major markets, such as WEAF, could charge \$500 for an hour of time. Boston stations might charge \$250, Cincinnati and Detroit around \$200, and Washington, D.C., \$150. An advertiser might "buy" the 13-station WEAF chain for \$2,600, a saving of \$300 over the individual station rates.

The advertising heard in the early 1920s was what we would call *institutional*, with no mention of price or sometimes even place of sale. Announcers described their products glowingly but generally, often postponing mention of the sponsor's name until the end. Increasingly, the sponsor attached its name to the performers or the program, as the *A & P Gypsies*, the *Cliquot Club Eskimos*, and the *Lucky Strike Hour*.

As soon as the Radio Group and the Telephone Group had signed the 1926 agreements, all stations could accept advertising. However, *direct advertising*, mentioning product, place, and price, was still frowned upon (see quote at start of this chapter). The president of AT&T, trying to protect its "monopoly" of broadcast advertising, expressed doubt as to the feasibility of the listener's having to buy or lease receivers from the broadcasting company. Sarnoff was still calling for outright philanthropic endowment. A GE spokesman opined that broadcasting eventually would be supported by voluntary contributions or by licensing individual receivers, another scheme doubted by AT&T. It was not until 1928 that broadcast advertising clearly became the breadwinner for American radio broadcasting—even though many persons objected to the mixing of programming and advertising.

3•6 Early Radio Programming

Early radio programs, resembling vaudeville in that there were several acts, usually musical, were presented with awesome seriousness. Announcers wore tuxedos, at least at the larger stations, and studios were decorated with potted palms. The tuxedos and palms lasted for decades in Great Britain but were soon discarded in the United States for everyday use. The earliest announcers were selected for their ability to speak with dignity, to sing or play an instrument in a pinch, and, until volume controls were developed, to push singers in and out from the carbon microphones. Instead of using names, announcers were known by certain initials: Thomas H. Cowan, apparently the first so identified in New York radio, was ACN (Announcer Cowan, Newark) when he started broadcasting over WJZ in October 1922.

An announcer for more than 30 years, Cowan became chief announcer of WNYC when it went on the air in 1924. Milton Cross, whose career spanned more than half a century (to his death in 1974), closely followed Cowan over WJZ, as AJN, using his middle initial since C was already taken. Cross became best known for his broadcasts from the Metropolitan Opera. Perhaps the most famous announcer of this period was Graham McNamee, who went to work for WEA in 1923 and quickly created a following for his sports broadcasts.

Many stations tried to broadcast on a schedule, but luck played a large part in a given night's actual content. Major programs were announced and publicized, but poor weather or slow transportation often prevented a guest artist from appearing. When stations arranged to broadcast special talent or dance bands—usually from the studio but sometimes by remote telephone line from a hotel ballroom—they might run the program as long as the individual or group had something to offer. Although phonograph records sometimes were used, they were considered a low-class source of programming. There were few planned programs at first, only short segments like stories and articles in a magazine. Often, the programs of several stations that shared time on a single channel sounded so much alike that none of the stations could build an individual audience. Stations with only a few hours' air time on occasional nights early in the 1920s realized the desirability of regular hours—even on a shared channel. The addition of daytime programming advanced station recognition in the larger markets. However, regardless of the quantity of a station's production, program elements were similar. By 1925, the percentages of time devoted to various types of programs on nine stations in major cities was as shown in the boxed table.

3•61 Music

Because familiarity often makes it more enjoyable, music has been an entertainment staple for centuries; it is not "used up" in the same way as comedy or dramatic material. However, because music production frequently requires a large ensemble, it is not cheap. Phonograph records were initially the answer, but their imperfect quality meant poor sound reproduction; in fact, in 1922 the Secretary of Commerce prohibited large stations from using records and giving the public nothing more than what it could enjoy without a radio (see 3.8). The networks (see 4.3) refused as a matter of pride to air records, even battlefield recordings during World War II, until the late 1940s, and only in the early 1950s did records become the mainstay of radio programming (see 7.61).

In the 1920s, many artists were glad to appear for publicity value alone. Dance bands provided "potted palm" music, named for the decor of the hotel ballrooms in which they played. One of the first to be broadcast by remote pickup was the Vincent Lopez group, which had a weekly 90-minute program on WJZ in 1921. For years the radio audience instantly recognized the salutation "Lopez speaking." The same year, a group known as "Coon Sanders' Nighthawks" became so popular over WDAF in Kansas City, especially with DX-ers all over the country, that the group moved to Chicago.

Local stations imitated the larger ones, frequently nurturing talent up to the big time. The WLS (Chicago) *Barn Dance* country and western music program began in 1924 and lasted for many years. Of the big bands that were becoming popular, many had begun as small groups and built their reputations over radio, such as Lawrence Welk's, which had started in the 1920s in Yankton, South Dakota.

Types of Programs Broadcast in 1925 / This chart shows the kind of program broadcast in a period in February 1925 on three stations in New York, one in Chicago, and one in Kansas City. These powerful outlets in major cities were the stations most listened to at night but were not typical of local radio. Compare to table on page 120 for comparable data for 1932, and to table on page 276 for postwar radio in 1946.

Program Type and Subtypes	Percentage of Time
Music	71.5%
Dance	22.9%
Vocal	8.1
Combination	14.1
Concert orchestras	4.3
Soloists	7.6
Phonograph records	—
String ensembles	10.1
Sacred	1.0
Miscellaneous	3.4
Drama	.1
Continued plays, reading, etc.	.1
Sketches	—
Onetime plays	—
Other Entertainment	6.8
Women's	2.4
Children's	3.7
Feature	.7
Star (other than music)	.0
Information	11.5
Education	4.9
News	.7
Political	1.8
Market reports	3.6
Weather	.3
Sports	.2
Other	10.1
Foreign-originated	—
Health exercises	1.8
Church services	3.1
Miscellaneous	5.2
Total	100.0%

Source: William Albig, *Modern Public Opinion* (New York: McGraw-Hill, 1956), Table 20, page 447. By permission.

Classical music was also a staple on radio in the 1920s. In 1921, when Westinghouse put KYW on the air in Chicago, it programmed little more than the Chicago Opera, using a sophisticated ten-microphone system on the stage. In March 1922, WJZ brought orchestra and singers into the studio for a one-and-one-quarter-hour presentation of Mozart's *The Impresario*. The New York Philharmonic began weekly broadcasts over WEAF that November. The prestige associated with classical music appealed to several advertisers, sponsors of such programs as the National Carbon Company's *Eveready Hour*, which started in February 1924 as the first sponsored network program.

3•62 *Variety and Vaudeville*

Vaudeville—or traveling stage musical, comedy, and acrobatic acts—inspired several kinds of programs: professional acts, typically touring from theater to theater, local talent nights, and song-and-patter teams. The motion picture already had damaged the profitability of organized stage vaudeville circuits, and radio pushed it into its grave as talented performers gave up the nomadic life for broadcasting. Some of these gave more to radio than they got in return; some were one-man programming departments. Singer Wendell Woods Hall, a red-haired ukulele player with some stage and records following, worked a 3 P.M. to 3 A.M. shift on KYW at \$25 a week in 1922, after several months' work for nothing but excellent publicity. Although his late-night program made him one of the first well-known radio performers, the station carried him on a *sustaining* (no advertising) basis. In 1924, Hall was married over the air (WEAF), one of the earliest radio news

stunts. In New York, movie-theater owner Samuel S. Rothafel, known as "Roxy," joined the radio bandwagon as an impresario and master of ceremonies by putting his Capitol Theater show *Roxy's Gang* on WEAF almost intact in January 1923. The program, a happy mixture of music, comedy routines, and other things, lasted for 15 years. Al Jolson and Eddie Cantor were two of the vaudeville and variety people who had switched to radio by the end of the 1920s, although "big name" comedy-variety programming didn't start on the networks until 1933 (see 4.61). For those who were not headliners, performing on radio became more attractive than making one-night stands and more secure because radio was a dangerous competitor to the vaudeville circuits.

Although *talent night* could produce a sure-fire audience of the performers' friends and relatives, there was not enough talent in smaller towns, not enough local identification, not enough audience interest in this free entertainment to attract the kind of audience that the broadcaster desired.

Both local talent shows and vaudeville, but primarily vaudeville, produced the song-and-patter teams. These two-man (most women then on radio were singers only) teams would travel from station to station, offering songs and light chatter, often in dialect, for several weeks before moving on. Some stayed with one station and became well known, like Billy Jones and Ernie Hare, who began broadcasting on WEAF in mid-1923 and became known over the first few years as the Happiness Boys (Happiness Candy), the Interwoven Pair (Interwoven socks), and the Tastee Loafers (a baking company). Called radio's first real comedy team, they appealed through a combination of light comedy, music, and topical comment.

3•63 *Politics and News*

Music and variety made up more than three-fourths of the average station's programming in the early and mid-1920s. They were relatively easy to provide, were flexible to program, and could be accomplished with available talent. However, even in the infancy of broadcasting, stations were experimenting with ways of providing information to their listeners.

From the 1920 election returns over KDKA—and, indeed, a 1916 election-night broadcast by Lee de Forest—to the Watergate hearings of the 1970s, broadcasting and politics have been linked. Radio's first major political project was the 1924 election. From President Coolidge's December 1923 speech to Congress, through the nominating conventions, and to the election returns, radio was an ever fascinating source of firsthand information for millions of Americans. Chains of stations carried major speeches and comment. Coolidge's renomination by the Republicans was cut and dried; the Democratic convention went through 103 ballots before deciding on compromise candidate John W. Davis. For years afterward, radio listeners remembered or were reminded by comedians of the sound of a leather-lunged Alabama delegate starting off each roll call with "Alabama casts 24 votes for Oscar W. Underwood"—a favorite son candidate. After a few ballots, the convention began to echo the call, and radio made it a catchline all over the country. The night before the election, the President addressed the nation over 26 stations hooked up coast-to-coast by AT&T, reaching an estimated 20 to 30 million people, of a total population of roughly 110 million. Several big-city stations started the now traditional practice of interrupting regular programming to carry returns and some crude

analysis. KDKA was on the air from 7 P.M. until 4 A.M. the next morning, and many other stations stayed on past midnight. Between reports, stations offered musical interludes. For the first time, the whole nation was able to hear election returns virtually as soon as they were known. To their annoyance, newspapers had been scooped by radio.

Other kinds of news programs were less common. There were no daily newscasts at first. Many people felt that radio should provide entertainment and occasional special presentations and that newspapers could carry the news. Newspaper-owned stations sometimes used news bulletins as teasers to stimulate newspaper sales, and other stations sometimes read news as a filler, without bothering to pay or, often, to identify the source. Lecturers or commentators often discussed current news events. Perhaps the best-known commentator was H. V. Kaltenborn, an assistant editor of the *Brooklyn Eagle*, which sponsored him for a weekly news commentary over WEAJ starting in October 1923. His clipped pronunciation and incisive comment later distinguished him as network news reporter-commentator.

Many stations *did* carry special events, or "emergency" news where speed was important. Since all stations in the early 1920s were required to listen periodically to the maritime distress frequency of 500 kHz, reports of shipwrecks were prominent in news broadcasting, and the nearest powerful stations could, and indeed were required to, relay the SOS messages themselves.

Probably the best-known special news coverage of the mid-1920s was WGN's (Chicago) broadcasts from the 1925 Scopes "monkey" (teaching of Darwin's theory of evolution) trial in Dayton, Ten-

An Early Station Schedule: 1922 / This form letter was sent to letter writers who reported reception of the Westinghouse Chicago station KYW and requested a schedule. Between programmed reports, the station either played light studio music or simply went off the air.

Westinghouse Electric & Manufacturing Company

To... Chicago From... Chicago
 For Mr. W. C. Evans, Chief Department Radio Station KYW
Operator
 Subject: Date: April 21, 1922.


The attached is a copy of our present schedule for broadcasting, with the exception of the evening performance, which has in no wise been changed, namely:

7:30 - - Bedtime story
 7:40 - - Special feature
 8:00 to 9:00 - - Musical Program.

If for any reason it is not possible to broadcast on this schedule, please let me have a memorandum to that effect for each case, with the exception of the present 3:00 o'clock period, with which, as you know, I am familiar.

For your information, it is also possible that the 7:30 to 9:00 period may be changed shortly, but at present we will maintain that schedule.

G.H. Jasport-LR


 RADIO PUBLICITY DEPARTMENT.

Westinghouse Electric & Manufacturing Company

General Offices and Main Works
East Pittsburgh, Pa.

IN REPLY PLEASE ADDRESS THE COMPANY
AND REFER TO _____

H. G. SYMONDS
DISTRICT MANAGER
MALCOLM CARRINGTON
ASST DISTRICT MANAGER



111 WEST WASHINGTON STREET, CHICAGO, ILL.

Your letter commenting on the reception of our broadcasting of Chicago Board of Trade quotations, U. S. Bureau of Markets reports, financial summary, and baseball news, is indeed, appreciated.

Our schedule is:

- 9:25 A.M. Opening Market Quotations,
Chicago Board of Trade.
- 10:00 A.M. Market Quotations, Chicago Board
of Trade; Quotations every half
hour thereafter until 1:00 P.M.
- 1:20 P.M. Closing Market Quotations,
Chicago Board of Trade.
- 2:15 P.M. News and Market Reports
- 3:00 P.M. American and National League baseball
team line-ups; progress of games every
half hour thereafter until close of
all games.
- 4:15 P.M. News, Markets, and Stock Reports
- 6:30 P.M. News, Final Market, Financial, and
summaries of principal games played in
American and National League.
- 9:00 P.M. Summaries of principal games played in
American and National League.

It is our purpose to make this service as completely satisfactory to you as possible. We are pleased to have your comments concerning the reception of our broadcasting.

Yours very truly,

G.H. Jaspert-LR

RADIO PUBLICITY DEPARTMENT.

nessee. The famous confrontations between Clarence Darrow for the defense and William Jennings Bryan for the prosecution were carried live to Chicago audiences, reputedly costing the station \$1,000 a day in personnel, line, and other items. There was little concern then over radio's presence in the courtroom; the microphone stood squarely in front of the bench, and all parties accepted the wider forum it provided. This was a far cry from the furor over coverage of the Hauptmann (Lindbergh kidnaping) trial a decade later (see 5.63).

3•64 *Other Talk Programs*

Many program types familiar today were first tried in the 1920s, including religion, education, and sports. Educational programming has been discussed (see 3.4). Religious programming started when the U.S. Army Signal Corps (apparently unconcerned about separation of church and state) broadcast a church service in Washington, D.C., in August 1919. KDKA was probably the first private station to broadcast religious services when, on January 2, 1921, it transmitted an Episcopalian service, with microphones for organ, choir, and clergyman and with two technicians (a Jew and a Catholic) dressed in choir robes, on standby in case anything went wrong. As the years went by, stations traditionally broadcast a religious service or talk each week, usually on Sunday.

Considering their later popularity, it is odd that sports programs were seldom scheduled in the early 1920s. In April 1921, KDKA gave a blow-by-blow account of a boxing match. In July RCA broadcast the Dempsey-Carpentier heavyweight fight (see 3.21), with Major J. Andrew White, an early radio promoter and founder of *Wire-*

less Age, managing the broadcast. Later that summer KDKA covered a tennis tournament and a baseball game. Although few teams liked the idea of letting radio siphon off their attendance, the World Series was carried as early as 1922 over WJZ and other stations of the Radio Group, using Western Union lines, and noncommercial events such as sailing regattas were commonly described over the air.

During the mid-1920s, radio aired almost any subject discussed in public from astrology to politics; it programmed academic and popular lectures, cooking lessons, exercise programs. Programs for farmers—first market and weather reports, and then how-to talks—began to appear on Midwest stations in 1921–1922, particularly those operated by land-grant colleges with strong departments of agriculture. The battery-powered radio found a tremendous audience among rural Americans, nearly half the population (48.8 percent in 1920), who lived days away from the news at the end of poor roads and without telephones.

The *public service* program or announcement was an early feature. A marathon broadcast by WLS in March 1925, which raised \$200,000 for tornado relief in Illinois, set a standard for other disasters: first news or warnings of a flood or storm and then appeals for help and funds for its victims.

3•65 *Drama*

Radio drama did not become very popular until the 1930s and 1940s. When it first was thought of, producers had the fortunately erroneous impression that the action of a drama would have to take place in a tunnel or cave so that the audience could identify with something they couldn't see. Probably the first play broad-

cast on radio was "The Perfect Fool," which was having a successful run on Broadway with Ed Wynn in the lead. Wynn, starring also in the WJZ version on February 19, 1922, "froze" before the microphone and later complained that only with an audience to react against could he correctly time his delivery. When he became a regular radio performer, using the "perfect fool" character, Wynn insisted on a studio audience.

In the fall of 1922, GE's station WGY offered the first dramatic series, the weekly *WGY Players*, and in 1925 established a contest for audience-submitted scripts. Other stations, particularly in major cities with access to acting troupes, began to offer plays adapted from the stage or films. Probably the first play designed for radio was called "When Love Wakens" (note the "W-L-W"), written and directed by Fred Smith, program director of WLW (Cincinnati) in April 1923. Although original drama was tried elsewhere, it often lacked the audience-pulling power of a proven story and required enormous talent to produce successfully.

3•7 Creation of the Radio Audience

The increase in radio listening was both spontaneous and created: spontaneous in that experimenters and early program listeners were motivated to build or buy receivers, and created in that many more Americans had to be persuaded that the sizable investment of time and money was worthwhile—that radio was more than a fad.

3•71 *Development of the Receiver*

Until late 1920, just before KDKA's first broadcast, all receivers were home-

made. Some, like the crystal set, were cheap and simple—all it took was some wire and an oatmeal box to wind it on, a purchased piece of galena or other crystal and cat's whisker to probe it with, and a pair of earphones. More complicated sets were more expensive—the price of tubes, like many weekly wages, started at \$6—though not beyond the capabilities of experienced amateurs or the thousands of ex-servicemen trained in radio. Early sets varied in cost, looks, and effectiveness, until more advanced superregenerative or superheterodyne circuits became available and design more standard. Almost all had limited sensitivity—ability to pick up weak signals—and very limited selectivity—ability to tune sharply and pick up only one frequency at a time; and tube sets required not only expensive tubes but several types of expensive batteries, including cumbersome and heavy automobile storage batteries. Virtually all sets needed earphones for listening, making radio a solitary pastime, although several sets of phones could be hooked up at one time. Even when loudspeakers were developed, the additional amplification they demanded was so expensive—in both components and batteries—that they were not widely used. Early receivers were hard to tune, their many controls requiring an artist's touch, and their audio quality left much to be desired.

In fall 1920, commercially manufactured radios became available, principally in large department stores. The Westinghouse "Aeriola Jr." was a crystal set that cost \$25, and the "Aeriola Sr." was a tube set for \$60. By 1922 there were hundreds of manufacturing companies varying considerably in size. Many smaller companies assembled parts supplied by other companies. RCA, as sales agent for sets made by Westinghouse and GE, was the foremost distributor, but Crosley,

Grebe, and Atwater Kent also became familiar brands. Fortunately for the companies competing with RCA, the RCA-GE-Westinghouse agreements (see 3.12, 3.13) that required RCA to market GE and Westinghouse receivers worked against RCA because the long lead-time needed for this intercompany ordering made its "Radiola" sets obsolete by the time they hit the market. The public soon realized that inexpensive sets were no bargain due to their lack of quality and performance, and the average price per set climbed well above \$100.

After 1923 advertising and merchandising of radio receivers stressed brand name and product dependability. A National Radio Chamber of Commerce, later

the Radio Manufacturers Association and now the Electronic Industries Association, was established to improve quality standards, collect sales data, and speak for the industry before government and private forums. After Westinghouse brought the Armstrong superheterodyne patent into the patents pool, RCA gained recognition with the first superheterodyne receivers, which were expensive but sold well because they improved reception. Crosley, hoping to reverse the trend toward expensive sets, marketed the \$10 Crosley "Pup" in 1924, a small metal box with a single tube on top that could receive stations up to around fifteen miles.

By 1924 radio manufacturers were incorporating by the hundreds but were

The Early Radio Receiver: Homemade Variety / This is one of many published diagrams for a do-it-yourself radio receiver which could be assembled at a fraction of the cost of a commercially manufactured set.

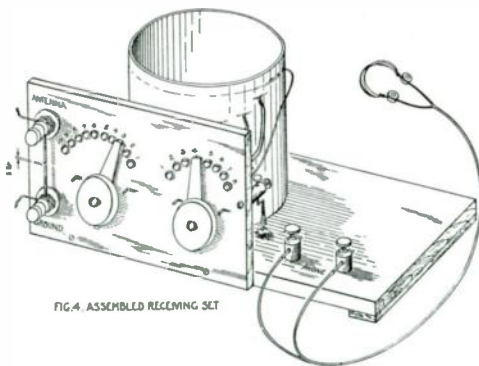


FIG. 4. ASSEMBLED RECEIVING SET

Source: Department of Commerce, Bureau of Standards. *Construction and Operation of a Simple Homemade Receiving Outfit*. Washington: Government Printing Office, 1922. Pages 12 and 16.

8. APPROXIMATE COST OF PARTS

The following list shows the approximate cost of the parts used in the construction of the receiving station. The total cost will depend largely on the kind of apparatus purchased and on the number of parts constructed at home.

Antenna:	
Wire, copper, bare or insulated, No. 14 or 16, 100 to 150 feet	\$2.75
Rope, $\frac{1}{8}$ or $\frac{1}{4}$ inch, 2 cents per foot . . . . .	.20
2 insulators, porcelain . . . . .	.15
1 pulley . . . . .	.30
1 lightning switch, 30-ampere battery switch . . . . .	.10
1 porcelain tube . . . . .	.10
Ground connections:	
Wire (same kind as antenna wire) . . . . .	.30
2 clamps . . . . .	.25
1 iron pipe or rod . . . . .	.75
Receiving set:	
3 ounces No. 24 copper wire, double cotton covered . . . . .	.75
1 round cardboard box	1.00
2 switch knobs and blades complete . . . . .	.75
18 switch contacts and nuts . . . . .	.45
3 binding posts, set screw type . . . . .	.30
2 binding posts, any type . . . . .	.25
1 crystal, tested . . . . .	.03
3 wood screws, brass, $\frac{1}{4}$ inch long . . . . .	.03
2 wood screws for fastening panel to base . . . . .	.30
Wood for panels (from packing box) . . . . .	.50
2 pounds paraffin . . . . .	.30
Lamp cord, 2 to 3 cents per foot . . . . .	.50
Test buzzer . . . . .	.30
Dry battery	6.00
Telephone receivers	10.70
Total	20.70

If the switches are constructed as directed and a single telephone receiver be used, the cost may be kept well below \$10.

If a head set consisting of a pair of telephone receivers instead of a single telephone receiver is used, the cost of this item may be about \$8 instead of \$4. Still more efficient and expensive telephone receivers are available at prices ranging up to about \$20.

WASHINGTON, March 27, 1922.

going bankrupt at nearly the same rate. In 1925, in spite of fall "radio shows" in major cities when set makers released next year's models just like automobiles, more manufacturers went out of business than started. The survivors usually were the larger and stronger companies—including several thousand that made components, in addition to the manufacturers and assemblers of complete sets—but virtually every year saw fewer of them.

Radio receiver manufacture became big business as the 1920s wore on (see Appendix C, table 8). Circuit designs were changed annually, with emphasis on easier operation by nontechnically minded listeners, especially women. The public bought sets enthusiastically—a half million in 1923, a million and a half in 1924, two million in 1925, one and three-quarters million in 1926. For example, when Gimbel's department store had a sale in May 1925 of Freed-Eisemann Neutrodyne five-tube receivers—including one "Prest-O-Lite" A battery of 90 amperes, two 45-volt B batteries, one phone plug, a complete antenna outfit, vacuum tubes, and a choice of loudspeakers—it took 240 clerks to sell the 5,300 receivers, at \$98.75, \$15 down—even though this price represented as much as several months of a workingman's wages. These 5,300 sets joined the 2.5 million already-in use at the end of 1924.

In 1926 "battery-eliminator" or plug-in models reached the market to the delight of everyone except the battery manufacturers and households with no electricity, a rapidly shrinking proportion. A simple connection to house current eliminated 40 to 50 pounds of batteries and a maze of wiring. Common in the later 1920s were improvements in appearance—a mahogany box was more acceptable in the living room than a homemade *bread-board* receiver without a cabinet; in conven-

ience—John V. L. Hogan's *uni-tuning* reduced controls to one tuning knob and a volume control; and in economy—the plug-in model was cheaper. As listeners assiduously updated their installations, older sets went to the attic to provide parts for future experimenters, or out to rural areas without electricity and with less esthetic sensibility.

3•72 *A National Craze*

By the end of 1921 about one in every 500 American households had a radio receiver; by 1926 one radio receiver had been sold for every six households. Considering that some high-income households probably had purchased more than one receiver in this period and that home-built sets, not included in the statistics, counteracted any bias in the figures, it was estimated that one family in six had a radio. All over the country, newspapers, magazines, clubs, and classes fed the urge for more information about this marvel. Prearranged groups listened around sets in hotel lobbies or stores. Because of Prohibition, there were no legitimate bars where people could enjoy radio on the house. (This was not the situation when television came in, however; then the local tavern typically was the earliest location for television.) Frequently radio retailers installed a mobile receiver in the back of a car to promote sales. Radio basically was an urban medium in its early years. Cost and poor reception kept farm families from owning sets, although buying increased rapidly when stations offered market and weather reports and when county extension agents explained radio's technicalities and expense and its potential benefits to the farmer.

During the early and middle-1920s audience research and listener feedback

The Early Radio Receiver: Commercial Models



Illustration shows Type R-D-3 Regenerative Receiver and Detector —\$60.00
Type A-2 Two-Stage Amplifier—\$40.00
(Licensed under Armstrong Patents)

ATWATER KENT

R A D I O



FOR the owner of Radio there is more and better broadcasting than ever before. Concerts, operas, lectures, sermons, educational courses, market, weather and special reports, and always the thrill of unexpected announcements of important happenings.

Atwater Kent Radio in your home will insure you countless evenings filled with joy.

You will find Atwater Kent Receiving Sets and Loud Speakers well within your means. To fully appreciate their many advantages, see the new Models at any radio dealer's.

Note the materials used in their construction; the best that money can buy.

Feel how smoothly the dial turns; that's but one example of their master workmanship. And then listen to the remarkable reception. Note the ease with which you can bring in stations, with ample volume, even from a distance.

For selectivity, distance, volume, clear reception, simplicity of operation and beauty of design, Atwater Kent Radio is unequalled.

These qualities your radio must have to give you perfect satisfaction. Be sure of getting them all by buying Atwater Kent.

Instruction literature on request

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Patent Cases prices slightly higher



MU-RAD ★ RECEIVERS

The Ultimate in Radio Reception

The New Star in the Radio World

"WHEN KNIGHTHOOD WAS IN FLOWER," Crusaders in distant lands communicated with their own countries by carrier pigeon. The system, learned from the Saracens, was greatly perfected by the Crusaders. Today, ordinary radio reception has been excelled by a new perfection of the art—Mu-Rad Receivers. Swift as thought, clear as the voice, sensitive beyond belief! Cities, 4,300 miles and more away, send their news and entertainment to the Mu-Rad owner. Conservatively guaranteed for 1000 miles, using only a two-foot loop aerial.

WRITE FOR LITERATURE



MU-RAD LABORATORIES, INC.
806 FIFTH AVE. ASBURY PARK, NEW JERSEY

were slight. Broadcasters programmed to suit their own desires since they knew little about the audience's makeup, listening habits, or preferences, other than what they picked up in social and business conversations. The station could determine its area coverage from the postmarks on listener requests for DX cards, which it sent to verify long-range reception; and could get additional feedback through comment cards—supplied by radio shops to enable listeners to relate where they heard a certain broadcast, what they thought of it, and what receiving equipment was used; signal coverage maps prepared by engineers to show the potential audience; receiver sales records kept by retail outlets; and station mail counts of listener response, often to a *giveaway* offer. At best, these data enabled station owners to make an educated guess as to audience size and potential size. Most did not bother to guess, at least not until advertising became their main support. Then, the audience became the station's most valuable asset, and knowledge of it made the difference between success and failure.

3-8 Further Attempts at Regulation

All these developments took place within the inadequate regulatory pattern of the Radio Act of 1912, which was passed long before broadcasting was conceived (see 2.4). It empowered the Secretary of Commerce to license all stations and operators for commercial or amateur radio transmissions; indeed, it gave him no discretion, but required him to license all applicants meeting the minimal standards—essentially United States citizenship—and assign call letters (see Appendix B). Upon President Warren G. Harding's election in 1920, the Secretary of Commerce appointment went to Herbert Hoover, fresh from

an active engineering and public service career, most recently providing food relief to war-torn Europe. Until 1921 the Bureau of Navigation of the Department of Commerce kept track of amateur and commercial (maritime) radio operations.

When broadcasting to the public started, the department allocated a single wavelength for it, although experimentation frequently took place elsewhere on the spectrum. This wavelength of 360 meters, or 833.3 kHz, was not far from the international distress and calling frequency of 600 meters (500 kHz), a range familiar to experimenters and amateur hobbyists. (The 600-meter wavelength had been selected partly because it was the longest for which an antenna could be strung between the masts of a typical ship.) In December 1921, before the number of broadcasting stations began to climb sharply, a second wavelength of 485 meters (618.6 kHz) was added, primarily for crop reports and weather forecasts. To broadcast such "government services," stations would switch easily from 360 meters up to 485 meters, since the transmitters were tuned, like a radio receiver, rather than fixed by crystal control on a particular frequency.

During spring 1922, there were so many stations on the air that the department *had* to provide a third wavelength that summer of 400 meters (750 kHz) for Class B stations. These typically better stations were required to operate with at least 500–1,000 watts and could not use phonograph records. The new rule tended to create a privileged class on 400 meters, with most stations still crowded on the 360-meter wavelength. Although those who ran the powerful stations, and the typical listener, liked this move, it did not relieve the increased crowding on the airwaves. In a way, it was surprising that this system worked at all for its short life, until

May 1923, since the Radio Act of 1912 gave the Secretary of Commerce very little administrative power beyond that of persuasion.

3•81 *Hoover and the National Radio Conferences*

As the number of broadcasting stations grew from 30 to more than 500 in a single year, government, as well as commercial and amateur operators, faced new problems. Complaints of interference were filed; pressure mounted for greater coordination. Secretary Hoover, in need of constructive advice, convened a conference of civilian and government experts, at the direction of the President, to discuss radio's problems and suggest legislative solutions. Fifteen official delegates—ten representing governmental interests and five nongovernmental interests, particularly in science and engineering—gathered in Washington on February 27, 1922. (Members of the American Radio Relay League, meeting a little earlier in the same city, were very unhappy at the prospect of additional regulation!) Disagreement marked the conference when AT&T, GE, Westinghouse, and RCA favored keeping the Commerce Department in control of broadcasting rather than giving that role to the army or the navy, and the navy and the post office had different ideas. The conference agreed, however, on some recommendations: (1) that the government regulate technical aspects of broadcasting by assigning stations to specific frequencies, with specific power and hours of operation; (2) that more channels be added to reduce interference; (3) that radio be considered a public utility, operating in the public interest; (4) that advertising be limited to naming the sponsor; and (5) that four classes of station be recognized, gov-

ernment, private (educational), private (others), and toll (paid service). These recommendations, as introduced into the House of Representatives by Congressman Wallace H. White, Jr., (R-Maine) called for administration by the Secretary of Commerce with no provision for court review, while his opponents called for an independent commission. The bill passed the House on the second try early in 1923 but died in the Senate Interstate Commerce Committee.

While waiting for congressional action, Hoover opened up the new Class B 400-meter frequency, as the number of stations increased from 60 to nearly 600. Three channels were clearly insufficient for satisfactory nationwide broadcast service, and Hoover called the second National Radio Committee conference. It convened on March 20, 1923, with 20 delegates. Its report reiterated the need for congressional action and called for various holding actions: (1) establishment of three classes of stations; (2) division of the country into five regions, with stations assigned accordingly to provide more equal service—an obvious political need; (3) giving the Secretary of Commerce discretion to choose among applicants for the same facilities, instead of prolonging the voluntary allotment of segments of time on a single wavelength to several stations; and (4) discussion of station financing and copyright, suggested by the American Society of Composers, Authors, and Publishers (ASCAP), a performing rights licensing organization.

As a result of the conference, Secretary Hoover announced a new system of frequency assignments on May 15, 1923. There would be, eventually, two classes of stations occupying the band from 550 kHz to 1,350 kHz (see diagrams on page 86). Stations originally operating on 833.3 kHz were designated Class C until they could

be reclassified into A or B. Class A stations, transmitting less than 500 watts, were assigned to the top and bottom of this band: 550–800 kHz and 1,000–1,350 kHz. Class B stations, using 500 watts or more, were assigned to 870–1,000 kHz, leaving 833.3 kHz unmolested with “guard band” of nearly 35 kHz on either side. This vast increase in spectrum space made many receivers out of date but established AM radio broadcasting firmly in the heart of its current band and made adequate regulation possible.

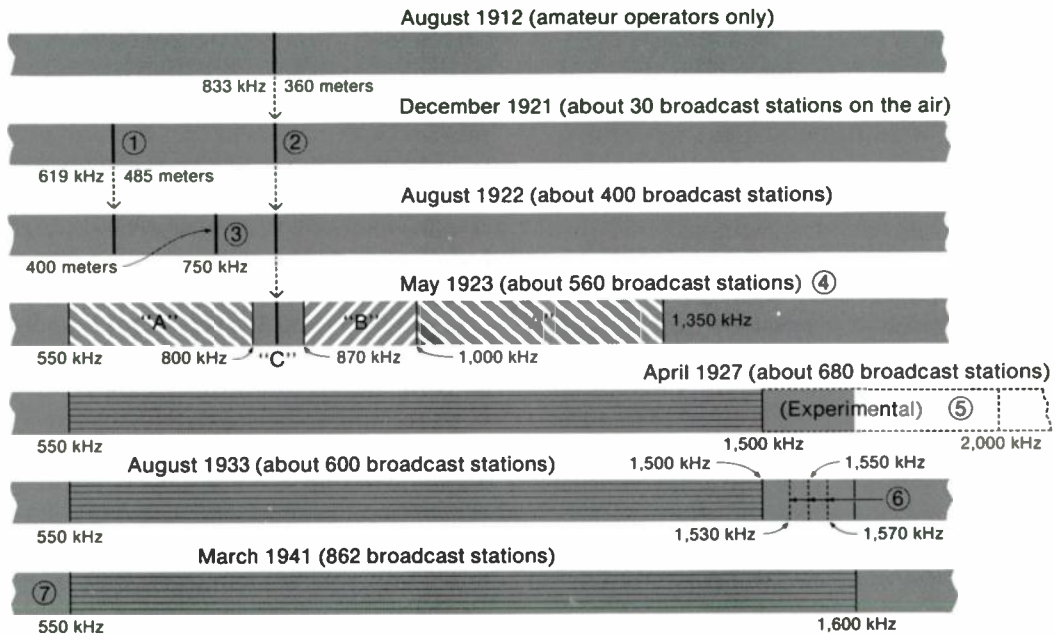
But adequate regulation was not to come from the Department of Commerce, at least not under the 1912 Radio Act. In summer 1923, the U.S. Court of Appeals for the District of Columbia ruled in *Hoover v. Intercity Radio* that the Secretary of Commerce could not regulate radio other than assign wavelengths and that his license-issuing function was purely clerical. A 1912 opinion of the attorney general had come to essentially the same conclusion, and a later opinion and the 1925 *Zenith-WJAZ* case (see 3.82) concurred.

During 1923 and 1924, Congress still couldn't pass a new radio bill. Hoover called the Third National Radio Conference in October 1924 and told the 90-odd delegates that the country needed a broadcasting system controlled largely by self-regulatory bodies rather than government. President Coolidge echoed some of Hoover's philosophy when he advised the conference that the government should not operate stations in competition with private broadcasters and that there should be no monopoly in broadcasting. David Sarnoff's announcement that RCA was planning a chain of superpower, 50,000-watt, stations, starting with one in New York, led to objections from smaller broadcasters and study by a conference committee. The conference concluded that: (1) it strongly opposed monopolistic practices; (2) the

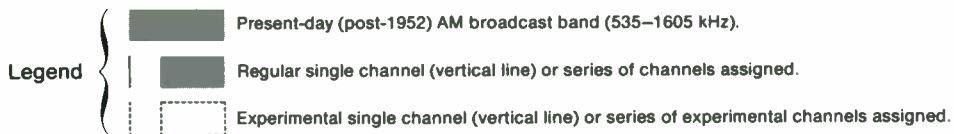
power of the Department of Commerce should be extended in technical areas only; (3) national broadcasting through wired interconnection of stations, rather than shortwave, should be encouraged; (4) experimentation with superpower should have strict supervision; (5) power of existing stations should be increased, particularly where rural listeners would benefit; (6) the top of the broadcasting band should be extended to 1,500 kHz, and the regional zoning system should be revised to increase the number of channels by 30, to 100; and (7) the classifying and labeling of stations should be changed. The third conference made no call for congressional action; in fact, Hoover asked Congressman White not to introduce a bill until some of the problems raised at the conference could be corrected or put into more specific recommendations for legislative action.

A year later, the fourth and largest National Radio Conference was held in Washington on November 9, 1925. Its 400 delegates considered three topics: limiting the number of stations, granting licenses on the basis of “public interest” service to the listener, and appointing local committees, familiar with their own areas, to help the Secretary of Commerce select recipients of broadcast franchises. The conference strongly supported limiting the number of stations, even if it meant allowing the secretary to remove some of the 80 stations still on 833.3 kHz. The principle agreed to was that having a few stations broadcasting high quality programs was more desirable than having many stations offering mediocre programs, and that adding new channels would be irrelevant to this problem and unfair to other radio services. The conference found it difficult to define “public service” but supported the suggestion that a prospective licensee offer more than desire and money in order to procure a license. The idea of local com-

Growth of the Standard (AM) Broadcast Band / In the diagrams below, each bar represents the standard (AM) broadcast band (medium-wave) frequency allocation in the United States in the mid-1970s. Superimposed on those bars are earlier allocations for AM stations (see 3.22 and 3.81). Small circled numbers refer to notes at end of diagrams.



(Note: for clarity, repeated assignments in the 1912–1923 period are noted by arrows rather than kHz and meter duplications.)



Notes

1. Used only for government reports (weather, crops, etc.).
2. Used for all other program types: entertainment, lectures, etc.
3. Called Class B with more stringent technical and some programming requirements. By October 1922, six months after this allocation, congestion was so great that time-sharing was necessary for stations on this wavelength in larger cities.
4. For this allocation, the following restrictions were in force: Class A— less than 500 watts, located on top and bottom of band; Class B—500 or more watts in middle of the band; Class C—temporary for stations on 360 meters (833 kHz) until they were reassigned to Class A or B. Because such stations, often the older ones, were seldom equipped to stay exactly on frequency, space was left on either side of the single channel; Class D—(not shown) for developmental work, with frequencies assigned to radio equipment manufacturers.
5. For experimental use only, including AM and visual (TV) experimentation. Most 1,500–2,000 kHz assignments were temporary.
6. Specific 20 kHz-wide channels (twice the normal AM channel width) were set aside on 1,530, 1,550 and 1,570 kHz for high-fidelity AM experimental broadcasting. Only a few stations were assigned here.
7. The 540 kHz channel was added to the U.S. AM band in December 1952, the last expansion to date.

mittees was rejected. The conference decided that advertising was a proper means of support for broadcasting if it was indirect or institutional—apparently an acknowledgment that advertising was the best support option available. Matters discussed at earlier conferences were again raised. As to copyright, since the courts had made it plain that broadcasting constituted a public performance, it was decided that stations needed permission of the originator to rebroadcast programs. Public utility status as advocated by the first conference was rejected. Superpower experiments had proved that smaller stations need not be as worried about being “blanketed” by larger stations. Congressional action was again urged, specifically

for administrative flexibility for the secretary, a commission or some other administering body, and renewable and revocable, for cause, five-year license terms. A baker’s dozen of formal recommendations were introduced as H.R. 5589 by Congressman White in December 1925, and an amended version became the Radio Act of 1927 (see 4.81).

3•82 Chaos

The already tenuous authority of the Secretary of Commerce disintegrated shortly after the Fourth National Radio Conference. Late in 1924 the Zenith Radio Corporation, a receiver manufacturer, ap-

An FRC Commissioner Describes the Chaos of 1926–1927 / In a June 1927 speech in Chicago, newly appointed FRC Commissioner Orestes H. Caldwell looked back on the post-Zenith case confusion that precipitated the Radio Act of 1927 (see 4.81):

...many stations jumped without restraint to new wave lengths which suited them better, regardless of the interference which they might thus be causing to other stations. Proper separation between established stations was destroyed by other stations coming in and camping in the middle of any open spaces they could find, each interloper thus impairing reception of three stations—his own and two others. Instead of the necessary 50-kilocycle separation between stations in the same community, the condition soon developed where separations of 20 and 10 kilocycles, and even 8, 5, and 2 kilocycles, existed. Under such separations, of course, stations were soon wildly blanketing each other while distracted listeners were assailed

with scrambled programs. . . . Some of the older stations also jumped their power . . . and heterodyne interference between broadcasters on the same wave length became so bad at many points on the dial that the listener might suppose instead of a receiving set he had a peanut roaster with assorted whistles. Indeed, every human ingenuity and selfish impulse seemed to have been exerted to complicate the tangle in the ether.

Source: Federal Radio Commission. *First Annual Report: 1927*. (Washington Government Printing Office, 1927) pages 10–11.

plied for a permit, built a station, and in due course received a license for 930 kHz, which it had to share with several other stations. Zenith soon outgrew the two hours a week it had originally requested and asked for permission to broadcast longer hours on an unused wavelength at 910 kHz, which the United States had agreed to reserve for Canadian stations. Permission was refused. When Zenith defiantly “jumped” to 910 kHz, other stations announced their intention to follow. The Commerce Department took Zenith to court, but an Illinois Federal District Court decided on April 26, 1926, that there was “no express grant of power in the Act to the Secretary of Commerce to establish regulations.” Finally, the Commerce Department tried to get the pending Dill-White radio bill through Congress, but it was too late in the session. The attorney general, in a requested opinion issued on July 8, 1926, supported the position that the secretary did not have adequate legal power to deal with the situation. The department then had no choice but to continue processing applications, and, in a period of seven months in 1926, more than 200 new stations went on the air, creating intolerable interference in major urban areas.

3•83 *Initial Self-Regulation*

Secretary Hoover had preached that industry could avoid governmental control through self-regulation. The cacophony on the air after mid-1926 was ample proof that broadcasters could not cooperate sufficiently to function without outside regulatory force. Indeed, what self-regulation there was resulted mostly from external threat rather than internal conviction. In the earliest years, self-regulation meant little other than “silent nights.”

Time-sharing was mostly voluntary, but, except for the period after the Zenith decision, there was always the threat of government action. In technical matters, broadcasting clearly needed a governmental traffic cop; in programming, broadcasting managed alone, typically exercising its freedom by censoring many dissenting points of view and presenting a conservative, business-oriented middle-class viewpoint. The avoidance of controversy became almost a fetish in later years.

Although a matter more of self-interest than self-regulation, the broadcasters’ fight with ASCAP (American Society of Composers, Authors, and Publishers) in the early 1920s led the way toward organizing the broadcasting industry, a necessary step toward self-regulation. ASCAP—a performing rights, copyright-licensing agency founded in 1914—was concerned that record sales and, increasingly, broadcasting were the cause of declining revenues from sheet music sales. In 1922–1923, ASCAP demanded royalties from several selected stations for playing ASCAP-licensed music. Although AT&T’s WEAf agreed to pay a few hundred dollars a year for a blanket license, possibly because of AT&T’s own stance on patent rights, most stations balked because they had no income and relatively large expenses already. Broadcasters contended not only that they ran a nonprofit business but that the publicity they gave to the music probably boosted record and sheet music sales. When ASCAP threatened to bring suit, as the Copyright Act of 1909 clearly allowed, a few stations capitulated but others dropped ASCAP-controlled popular music from their repertoires.

On April 25 and 26, 1923, a small group of broadcasters met in Chicago to establish a common front against ASCAP, including, in later years, its own music-licensing organization. This group, calling

itself the National Association of Broadcasters, picked the head of Zenith, Commander Eugene F. McDonald, Jr., as its first president. Representatives from about 20 stations attending NAB's initial convention in New York that fall discussed politicians on the air, the need for technical cooperation and control, and possible revisions in the copyright law. The new group was small and largely ineffective at first—ASCAP got its royalties—but the groundwork had been laid for a powerful organization that would face ASCAP again with somewhat different results (see 5.85).

3•9 Radio's Early Impact

There were indicators of the roles of radio in this country and abroad beyond its impact on the American home of the 1920s that we have already noted (see 3.72).

3•91 *Domestic Effects*

The radio craze or fad of 1921–1922 perhaps is best seen in the popular literature that grew up to feed and support, and be supported by, the national interest in wireless. Technical magazines about wireless had been around for some time, but they catered to the experimenter and not to the general public. Shortly after the first broadcasting stations went on the air, some general interest radio periodicals appeared. *Radio Broadcast*, which began in May 1922, concentrated on programming and industry economics, but in 1924 it began a column of radio criticism, particularly of musical programs. Then other popular radio periodicals, mixtures of fan and how-to-do-it technical magazines, lured an avid public. Almost all general magazines of information, opinion, and entertainment featured articles about broadcasting.

In the early years, newspapers devoted considerable attention to radio. In 1922 the *New York Times* started a regular radio section with the late Orrin E. Dunlap, Jr.—now better known for his many books on radio and television—as columnist-critic; in 1924 the *Christian Science Monitor* started a radio section; in 1925 Ben Gross began his forty-five-year career with the *New York Daily News* and a writer signing himself “Pioneer” offered technical tips and brief reviews in the *New York Tribune*. Books appeared in increasing numbers, many on “how to build your own radio set,” a few of the “gee whiz!” school covering all aspects of radio, and no less than four different series of boys’ thrillers with the same title of “The Radio Boys.”

Broadcasting to the public had by no means killed the amateur radio service. The American Radio Relay League became active again after World War I, and its publication *QST* reached an expanding membership. In 1925, a 23-nation conference created an International Amateur Radio Union to combat restrictive laws around the world. Ham operators and experimenters deserved credit for the development of new operating techniques, efficient equipment and circuits, and the opening up of the higher reaches of the electromagnetic spectrum.

Radio had a telling effect on other industries. Hardest hit was the phonograph record industry, which suddenly faced competition from “free” music sent over the air. As radio-transmitted sound improved and as the amount of broadcast music increased, demand for expensive but low-fidelity phonographs lessened and the companies that made them suffered. Radio also undermined vaudeville, although the traveling shows, some of which survived into the 1930s, were also a victim of the motion picture. Many of the acoustic and electronic principles that produced ra-

dio were applied to the sound motion picture, which made its appearance in the late 1920s. Without the Audion, sound motion pictures would have been impossible. The weekly bible of show business, *Variety*, started a special radio section in 1924 in testimony to the growing importance of the medium.

All in all, radio was a common household device by 1926. Although serious technical interference and economic problems existed, its potential for supplying entertainment to the American public was evident. Fortuitously but fortunately, the leisure time of most Americans was expanding just as radio was developing. Effects from the rapid spread of news and the loss or reduction of regional speech dialects and patterns were more subtle or more gradual.

3•92 *Radio Abroad*

Although much attention was diverted to broadcasting, a strong interest in the market for point-to-point international communications remained. With the end of navy control of radio facilities in March 1920, commercial transatlantic wireless service returned, with RCA, the "chosen instrument" of American communications policy, profiting from traffic agreements with British Marconi and with other administrations.

Interestingly enough, the alternator that led to the birth of RCA was quickly superseded by high-power vacuum-tube transmitters. Discovery of the propagation characteristics of shortwaves suddenly made much-prized longwave frequencies less desirable. Shortwaves had been discarded commercially, with the belief that nothing below 200 meters (1,500 kHz) would work except for very short distances, but amateur operators had found

ways to use them for long-range transmissions. Ham operators bridged the Atlantic with shortwave as early as December 1921 but did not know how to overcome a high level of interference. However, after the major manufacturing and operating companies, including Marconi, had been shown the possibilities of long-range sky-wave transmissions on shortwave frequencies, it did not take long to make it practical. By the late 1920s, shortwave was used for long-distance telephone as well as the "Empire Chain" of stations connecting all the British Empire. The amateurs were "kicked upstairs" again, to yet higher frequencies, when their playground just below 200 meters was taken over by commercial and governmental radio services.

Radio broadcasting developed in many other countries at the same time it developed in the United States. Less developed nations did not establish indigenous radio broadcasting for some years, although some colonies had a radio system modeled on the mother country's. The first broadcasting station in Great Britain began in February 1920, near London. When a few other stations began experimental voice and music transmissions, interference and political and financial considerations caused the General Post Office, the licensing authority, to step in. This led to the establishment of the single British Broadcasting Company, owned and operated by a consortium of major manufacturing firms. It began operations in 1922, with eight stations, and received income in the form of royalties on receiver sales—discontinued in 1924—and yearly license fees for sets. In return for the risks taken by the manufacturers, the post office agreed to have imported receivers banned from the market. For a number of reasons the private company was politically disturbing and did not work very well. When the House of

Commons called for an investigation in 1923, the Sykes Committee recommended governmental control, but it was not accomplished until 1927. Just as Sarnoff was to rise from obscurity to dominate the development of RCA, so did John C. W. Reith, the managing director of the privately owned British Broadcasting Company, advance to develop the publicly owned British Broadcasting Corporation. In his 15 years with the BBC, he imposed his personal values upon an entire system, which pays at least lip service to them today, a third of a century later. For his service he was knighted and later made a peer.

Broadcasting also got underway in other parts of the world. In Europe, a Netherlands station claims a starting date of 1919 (see 3.21), Spain started by 1921, France and the Soviet Union in 1922, Germany in 1923, Italy in 1924. By 1926 there were 170 stations in Europe, 5 in Africa, 40 in Latin America, 10 in Asia—mainly in Japan, which had begun the government-owned NHK in 1925—and 20 scattered about Oceania, chiefly in Australia, New Zealand, and the Philippines. Broadcasting in Canada began in 1919 over a Marconi-operated transmitter in Montreal. There were 34 privately owned Canadian stations by 1922–1923, and roughly 75 by 1926. The first Mexican station was established in 1921, the second opened in 1923, and by 1926 there were about 10 privately owned stations and one government-owned educational operation, started in 1924. Few sets were manufactured domestically, and few sets were imported until Mexico issued its first radio law in 1926.

In 1926, an estimated 12½ million homes had radio; half of them were in the United States, which also had half the broadcast transmitters then operating—and the real growth was just around the corner.

3•93 *Period Overview*

Surprisingly, only one important precedent emerged as radio spread over the country: broadcasting in the United States essentially was to be privately owned and commercially supported. This was a time of both program and technical experimentation. The way was paved for permanent networks, educational broadcasting had its brief fling with AM stations, the radio receiver developed from an ugly battery-powered apparatus to a handsome piece of plug-in furniture, which became more sensitive, selective, and reliable each year. Regulation, however, was a patchwork based on the 1912 Radio Act, which was never intended to cover broadcasting, and the era ended with chaos and federal helplessness.

Radio's product was new and free—once you had a receiver—and that was enough to create a tremendous nationwide boom. A similar period of excitement would occur three decades later with the initial spread of television. Radio was both a hobby for searchers for distant stations and a pastime for listeners, and program types showed that duality. Led by a few big stations, radio quickly settled into a pattern of quarter-hour and half-hour programs offered at set times. It began as an evening medium and slowly spread into daytime hours as the audience increased and program material and advertising support became available for music, variety, and talk.

The early 1920s were a period of widespread experimentation where successful trials sometimes became precedents for newer stations. It was an exciting time for workers in broadcasting and often a frustrating one for an audience that could not hear clearly or hear all it wanted. By 1926 some wondered whether the industry's lack of financial and organizational

stability was bringing the radio fad to an end.

Further Reading

The best social history overview of this era is found in Barnouw (1966). Stressing behind-the-scenes business maneuvering, but of lesser value because of its RCA bias, is Archer (1938). Views of the radio industry by contemporaries responsible for major decisions can be found in

the interesting collection of talks titled *The Radio Industry* (1928). Schubert (1928) offers an undocumented but highly accurate and exciting account of these early years, while Banning (1946) provides the best history of an early station, AT&T's WEAF. The most detailed review of the "oldest station" controversy is Baudino and Kitross (1977). The development of early broadcast advertising and program formats is best told in Hettinger (1933). Recent research on radio in the 1920s and

Key Broadcasting Indicators: 1925 / This is the first of ten tables that provide comparable data for a 50-year period (to 1975) at five-year intervals, the tables being found toward the end of chapters 3–9. Sources for 1–3 and 11 are the tables in Appendix C, while other information comes from sources indicated below. Most data are for January 1.

Indicators	AM Station Data
1. Number of commercial stations	445
2. Number of noncommercial stations	125
3. Total broadcasting stations on the air	570
4. Number of network-affiliated stations	12
5. Percentage of commercial stations affiliated with networks	2.7%
6. Total industry income	na
7. One-hour station rate (New York)	\$500
8. One-minute station rate (New York)	na
9. One-hour network rate evening	\$4,080
10. Number of broadcasting employees	na
11. Percentage of families with sets	10.1%
12. Broadcasting regulatory budget (Dept. of Commerce)	na

Notes (see Appendix D for full citations):

na = not available or not applicable.

4. and 5. refers for this year to AT&T-owned and WEAF-centered Broadcasting Company of America with 12 affiliates and some alternates.

6. Hettinger (1933) says no reliable data is available before 1931.

7. Evening rate for WEAF according to Archer (1938) page 360.

8. Few if any stations sold time in this small amount.

9. See note on 4–5. This figure, however, includes 17 stations.

While in later tables most data are for a specific month, usually January, data shown here cover several different months of 1925 due to a lack of standard sources.

some contemporary reports are presented in Lichty and Topping (1975).

Contemporary views include a book by radio's first lasting personality (McNamee, 1926); articles in the monthly *Radio Broadcast* (1922-1930), then the most important periodical regularly discussing the industry; the first popular overview of radio broadcasting, programming, and likely effects and potential (Rothafel and Yates, 1925); a slightly more technical predecessor (Yates and Pacent, 1922); and the first scholarly book-length treatment of the economics of radio—indeed, the first doctoral dissertation on radio broadcasting—(Jome, 1925).

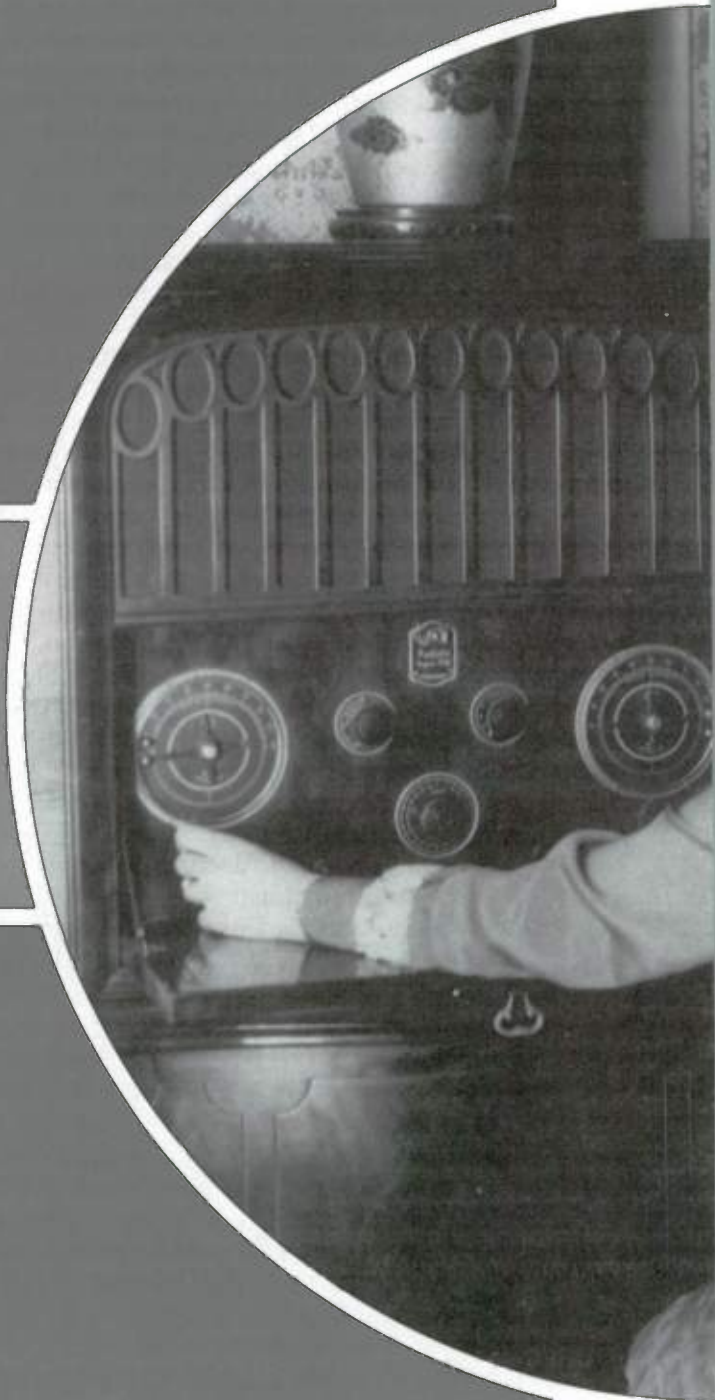
Legal aspects of radio in this confusing era can be found in the various reports of the National Radio Conferences (U.S. Dept. of Commerce 1923, 1924, 1926) and in the annual reports of the Department of Commerce, Bureau of Navigation, and later the Radio Bureau (U.S. Dept. of Commerce 1921-1926, 1927-1932). The detailed results of the first government investigation of the fledgling radio industry, concentrating on patents and economics, is found in the FTC report (1924).


Thorough and documented discussion of early broadcasting in the United Kingdom, the other major model for foreign countries, is found in Briggs (1961).

The Coming
of
Commercialism
(1926-1933)



"I doubt if we will ever make any money. Of course we have some hopes along that line, but I doubt if we will."
—NBC President Merlin H. Aylesworth testifying before a Senate committee, 1927





The Coming
of
Commercialism
(1926–1933)



"I know of no other activity, conducted entirely through private enterprise, which has seemed to Congress so important and so complex in its problems as to require the creation of a new and separate branch of the Government exclusively for its regulation."—FRC Commissioner Henry Bellows in an address, April 1927

The late 1920s were a frenzied time in America—perhaps best epitomized by one man and one trend. The man was Charles A. Lindbergh, whose May 1927 solo flight from New York to Paris made him the greatest hero of modern times. This country and others pressed parades and awards upon him for months, and his subsequent flying exploits and personal life were always front-page news, as were more tragic events (see 4.64 and 5.63).

The continuing trend was the rising stock market, which epitomized and encouraged the spirit of progress that pervaded the country. Nearly everyone, so it seemed, was “in the market,” usually buying stock on margin. In 1928, when Herbert Hoover won the presidency, films

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The Coming of Commercialism (1926–1933)

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were beginning to talk, Prohibition was a national joke, automobiles were competing with railroad transportation, and airmail pilots were attempting national airline service. Navy Officer Richard E. Byrd explored the Arctic and then the Antarctic, and in 1929–1930 the nation could hear his broadcasts from “Little America” near the South Pole. Rumors were abroad of something called television—radio programs you could see as well as hear.

Then, in late 1929, the stock market crash brought this period of expansion and excitement to a sudden stop. In a few weeks, many investors were wiped out and, more important, the nation’s spirit also sank into psychological depression. In late 1930, when millions were unemployed and breadlines formed in all major cities, the Hoover administration kept saying that the economy would soon turn for the better. But 1931 and election year 1932 were even worse. On a warm night in 1932, army troops with tear gas routed World War I veteran “Bonus marchers” from their tarpaper shacks in Washington, D.C. New York Governor Franklin D. Roosevelt won the November election and swept into the White House in March, brandishing a combination of skills—including his frequent use of radio—that would help move the country out of the Depression.

The present pattern of American broadcasting was set in the years between 1926 and 1933. Modernizing of federal regulation, the rise of national networks, acceptance and success of radio advertising, and a phenomenal increase in the radio audience—all took place in that short period. Only the years just after World War II saw changes of similar magnitude, and these were superimposed on the existing pattern rather than basically altering it. The 1926–1933 developments were more than evolutionary; they were basic directional decisions. Made by a wide variety

of people, they removed broadcasting from the role of experimental novelty and made it an industry. The rapid shift from boom to crash of the economy had important effects on radio’s growth and role. Most of the changes in broadcasting that took place during this period were begun before 1930, and were merely consolidated after that year, paralleling the changes in the nation’s social fabric.

A good example of this consolidation was the major change in character and function of the Radio Corporation of America, then the most important single voice in the radio manufacturing and broadcasting industries. In 1930 the radio-receiver manufacturing divisions of GE and Westinghouse were unified within RCA, and facilities and key personnel, like television experimenter Vladimir Zworykin (see 5.14) and patent chief Otto Schairer (see 3.13), were transferred from Westinghouse to RCA. However, a few months later, the federal government began to pursue antitrust prosecution recommendations made as early as 1923 in the FTC investigation of radio (see 3.23). In May 1930, a Justice Department antitrust suit sought to undo RCA’s newly unified ownership, contending that it was an unfair monopoly in restraint of trade in the field of radio apparatus. AT&T, by then divested of RCA stock, pulled out of the arrangements with little trouble (see 4.31). Over the next two and one-half years, lawyers tried to figure out ways for GE and Westinghouse to ease out of RCA control and manufacturing agreements without harming any of the firms irreparably. Finally, on November 13, 1932, they worked out a compromise acceptable to the Justice Department, and a consent decree was issued on November 21. GE and Westinghouse had a short transition period in which to divest themselves of RCA stock and get their representatives off the RCA

board. Exclusive license agreements made from 1919 to 1921 (see 3.13) became non-exclusive. GE and Westinghouse could not compete with RCA for two years, after which they could manufacture and sell their own radio receivers. RCA had to program radio stations owned by the two other firms for a decade, a boon to its subsidiary, NBC. RCA became a totally independent manufacturing, selling, international communications, and broadcasting concern, separate for the first time since its formation from GE, Westinghouse, AT&T, and other firms. As a convenience, it also continued to administer the patents pool, now nonexclusive. Although the newspapers gave the compromise minor coverage, it had major effects on the radio industry in the 1930s.

4•1 Technology: Better Sound and Early Television

By the late 1920s, technical changes in radio broadcasting were evolutionary rather than basic. They had to do mostly with improving the poor quality of transmitted sound and the elimination or lessening of over-the-air static. At the same time, reports began to reach the public of laboratory developments that were to eventuate in television. Breathless accounts of "television around the corner" began to show up regularly in the press.

4•11 *Improvement of Sound*

By the late 1920s, radio transmitters could send out a clean signal that would stay on its assigned frequency, and directional antennae that would limit interference with nearby stations were to be designed in later years. At the *studio* there was much room for better sound repro-

duction. The earlier standard of the telephone, capable of adequate voice but very poor music reproduction, was no longer acceptable.

In planning studios, new stations were beginning to rely on architects to improve sound quality instead of using cut-and-try burlap-covered walls still common in smaller stations. The carbon microphone, with its narrow-frequency response and habit of freezing up for sibilant sounds, began to give way in the 1930s to the condenser microphone, which had survived ten years of testing, and the dynamic microphone—still the most common type—both of which made radio talk and music sound more real because of their better frequency response.

Throughout the 1920s, radio stations generally presented music "live," or used regular, home-variety 78-rpm records, which had very poor frequency response and played for only three or four minutes a side. In 1929, WOR became one of the first stations to use electrical transcriptions: 33 $\frac{1}{3}$ -rpm discs, made with particular care, which were as large as 16 inches in diameter and played for 15 minutes a side. (Modern *microgroove* LPs have higher quality and play for a longer time.) These first transcriptions were substantially the same as those used for the earliest sound motion pictures, when silent films were synchronized to disc recordings in the projection booth. This new kind of recording made programming more flexible and improved sound, and more than one hundred stations began to use transcriptions regularly.

All attempts to broadcast better sound were limited by what the station could produce and transmit, the network carry on its lines, and the home set receive and reproduce. By 1933 the typical station transmitter could transmit an audio-frequency bandwidth of at least 3,750 cycles

per second—the equivalent radio-frequency bandwidth is exactly twice as much, or 7,500 Hz—and the best transmitters were capable of 5,000 Hz audio (10 kHz radio bandwidth). Low-frequency limits on transmission were in the 30–50 Hz range. Essentially the same bandwidth (30–5,000 Hz) is used today in standard (AM) broadcasting, although (1) a number of stations take advantage of a provision in the Federal Communications Commission regulations that permits them to use a wider bandwidth if they do not adversely affect other stations and (2) at one time a number of “high-fidelity” stations in the 1,500–1,600 kHz band were allowed to transmit 10,000 Hz audio. Although all these figures and standards seem inadequate, considering that the young human ear can hear up to 20,000 cycles or higher, 5,000 Hz sounds quite real compared to the 2,500 Hz bandwidth of a regular telephone instrument and circuit. Indeed, the main limitation on good network sound was the inability of AT&T lines to carry more than 4,000 Hz tones. The use of specially engineered lines overcame this difficulty but at considerable expense to the broadcaster. The home receiver typically lagged behind the studio and transmission facilities. Its audio had a tinny sound and rarely reproduced the higher and the lower portions of the audio spectrum. Unfortunately for the innovators of FM radio (see 5.11) and true high-fidelity music reproduction systems, the public became very used to this “radio sound,” which was, in all fairness, better than the hand-wound acoustic Victrola phonograph or the telephone.

4•12 *Technological Prehistory of Television*

Although television in the form of mechanical scanning systems (see Appen-

dix B) developed at full speed in the 1920s, it had a long history. One popular history of television (Hubbell) claims that the story goes back 4,000 years, but modern development started with the 1873 discovery by Joseph May and Willoughby Smith that the element selenium was capable of conducting small amounts of electricity in direct response to the amount of light falling on it. Later inventors, such as George R. Carey in 1877, found that banks of selenium cells, placed in a mosaic analogous to the human eye and wired individually, could send the elements of a picture as electrical signals from each cell simultaneously to a bank of lamps that lit in response to the electricity. In 1880, Maurice Leblanc and others developed the principle of scanning, or viewing picture elements successively, rather than all at once as in a mosaic device, and transmitting them sequentially over a single circuit. This approach was analogous to the solution of the similar problem faced by the telegraph industry at its start (see 1.41). A major refinement was the mechanical device—the mirror drum and, in 1883, Paul Nipkow’s scanning disc—capable of scanning and transmitting even a moving picture. These devices are briefly discussed in Appendix B under “Television’s Early Technological Development.”

4•13 *Development of Mechanical Television*

Of the many inventors and experimenters who worked on mechanical television in the 1920s, three made outstanding progress: Herbert E. Ives of Bell Telephone Laboratories, who worked with all the resources of a major corporation; John Logie Baird, a self-taught Scottish inventor whose system almost became the British standard; and Charles Francis Jen-

kins, an American who ran neck and neck with Baird but did not come as close to the prize.

Ives was assigned, with the help of substantial funds and staff, to keep AT&T "abreast of the general advances in the art of television." From research on wire-photo transmission in 1923–1924, his work culminated in 1927 with wire transmissions of still and moving pictures over hundreds of miles. In one example, Secretary of Commerce Herbert Hoover spoke and was viewed on a $2 \times 2\frac{1}{2}$ -foot neon-tube screen over a circuit from Washington to New York. In this April 7, 1927, demonstration, the picture was low definition—50 lines—but synchronized sound accompanied it. By the next year, outdoor scenes could be picked up and a three-channel color system was demonstrated. Bell Labs never promoted its system commercially, being content to keep "abreast of the art" with an eye eventually to servicing the interconnection of television stations. These experiments also generated Picturephone service, which AT&T has trotted out of the lab at intervals from 1927 to the present.

Baird (not to be confused with Hollis S. Baird, an American television experimenter) generally is credited with establishing television in Great Britain. In 1923, using a mechanical scanning system of his own design, he transmitted the first silhouette television picture by wire—almost simultaneously with Jenkins (see below). In 1925 both men transmitted moving silhouettes, and in 1926 Baird succeeded in producing shades of gray. Turning next to live action scenes as a source, in February 1928 he televised a woman's image from London to Hartsdale, New York, using the shortwave band to achieve that distance. Later that year he transmitted to the liner *Berengaria* a thousand miles at sea, and in 1932, foreshad-

owing today's large-scale closed-circuit transmissions of sports events, he transmitted the English Derby to a large screen in a London movie theater where 4,000 persons watched the race. Alexanderson had conducted a similar demonstration in Schenectady in 1930 and later at a Brooklyn theater. Many individuals and small firms constructed Baird "Televisors," as the television receivers were called.

In 1935, when the Television Committee of the British government had to choose television standards for the United Kingdom, comparative tests were held of the Baird mechanical system and an electronic system controlled by the giant EMI (Electric and Musical Industries Ltd.) company based partly on Zworykin's work in the United States (see 5.14). The committee decided in favor of the latter because they believed that Baird's system, although it tested well, was near the end of its potential development, while the electronic system could be improved considerably. Although greatly disappointed, Baird stayed in the field. In December 1941 he demonstrated improved color and stereoscopic three-dimensional television, areas he had worked in since 1928.

Jenkins, who invented a variety of devices based on drum and disc scanners, gave the first public demonstration of mechanical picture transmission in the U.S. in 1923 when he transmitted, by wireless, a photograph of President Harding from Washington to Philadelphia. From still silhouettes in 1923, Jenkins went to moving silhouettes, and then motion pictures, over navy station NOF in Washington, in 1925. His equipment was not as well engineered as Ives's, but he was a good publicist and aroused interest among amateurs and other experimenters. His system could transmit limited motion, achieving about sixty lines resolution at its best, compared to Ives's 48 lines and the 525 lines currently used

Eyewitness Accounts of the First Television / The first public demonstration of television was conducted in January 1926 in London by John Logie Baird (see 4.13).

The proof of Baird's achievement came on Tuesday, January 26. During the evening some forty members of the Royal Institution and other guests gathered at 22 Frith Street to see what the inventor had to offer. Besides Baird and Hutchinson, the only other "official" host was W. C. Fox, a Press Association journalist and friend of Baird. Fox greeted the visitors, who were allowed to enter the cluttered rooms in small groups after they signed a register. He recalls the event:

It was a cold January night and the members of the Royal Institution arrived in twos and threes. When they came out after the demonstration their remarks, such as I overheard, were much as one would expect. Some thought it was nothing worth consideration; others considered it the work of a young man who did not know what he was doing, while a few, a very few, thought there was something there capable of development. There was no realisation of the fact that they had been present at the birth of a new science.

Fox was at the head of the stairs on this occasion, but Baird had given him a personal demonstration a few days earlier:

The received image was admittedly crude, but it was recognisable as—whatever it might be—a face, a vase of flowers, a book opened and shut, or some simple article of every day life. The image received was pinkish in colour and tended to swing up and down. It was not possible to see much of the apparatus as it was covered by screens of one sort and another—extraneous light was not wanted and would interfere with the image.

A short, factual account of the demonstration appeared in *The Times* two days later. The reporter described the transmitting machine and the results:

... consisting of a large wooden revolving disk containing lenses, behind which was a revolving shutter and a light sensitive cell. The head of a ventriloquist's doll was manipulated as the image to be transmitted, though the human face was also reproduced. First on a receiver in the same room as the transmitter and then on a portable receiver in another room, the visitors were shown recognizable reception of the movements of the dummy and of a person speaking. The image as transmitted was faint and often blurred, but substantiated a claim that through the "Televisor," as Mr. Baird has named his apparatus, it is possible to transmit and reproduce instantly the details of movement, and such things as the play of expression on the face.

Source: George Shiers, "Television 50 Years Ago," *Journal of Broadcasting* 19:387-400, at pages 393-394 (Fall 1975). By permission.

in the United States. Claiming an amateur viewing audience of thousands, Jenkins organized a company in 1929 to manufacture both transmitting and receiving apparatus. The Jenkins Television Company announced commercial programs for 1930 and licensed a number of other manufacturers to use its patents, but it could not make a profit selling expensive novelties during a depression and quickly went into receivership. The De Forest Company purchased its assets, selling them in turn to RCA. Allen B. Dumont, chief engineer of the de Forest firm, became interested in television as a result, and later became a manufacturer of cathode-ray tubes and other television equipment and a televi-

sion broadcasting entrepreneur (see 7.32).

The scanning disc in many different forms held sway for roughly 50 years of television experimentation. Although many improvements could be achieved in mechanical scanning, mechanical problems increased with every increase in picture definition. However, many techniques investigated led to useful and practical results. Arthur Korn's 1902 facsimile experiments led to developments in television. In the late 1940s, CBS used the spinning disc principle for a system of color television (see 6.82 and 7.821). More recently, that system was modified to send the first color transmissions from the moon to earth in 1970.

Vaudeville Faces Television / Famous producer Flo Ziegfeld (right) looks into a Charles Francis Jenkins mechanical television receiver in 1928. From his expression, it may be that he did not think television was the show business medium of the future. Smithsonian Institution Photo No. 76-14655.



4•14 *Television Goes Public*

The television that promoters earnestly touted around 1930 was a collection of uncoordinated and incompatible systems. The Federal Radio Commission did little from 1927 to 1933 to establish television standards; perhaps it preferred to imitate the development of AM radio's equipment standards, which had evolved with a minimum of government supervision. To provide for orderly progression in television, the Radio Manufacturers Association in 1931 set nonmandatory standards at 48 lines and 15 pictures a second, with a secondary standard of 60 lines for more advanced research efforts. These standards were set somewhat below the most advanced state of the art, presumably for the benefit of promoters, inventors, and manufacturers who were impatient to introduce commercial television. Pressure for equipment standards in the 1920s and early 1930s might have been heavier had it not been possible, with a little adjustment, to receive signals from a station using one mechanical scanning system on a receiver designed for a different system. However, with the advent of rival electronic camera and complex synchronization systems in the mid-1930s (see 5.14) the lock-and-key aspect of television standards became operative; no electronic commercial television system would succeed until the government determined, or the whole industry adopted, common standards.

When early television experimenters were trying signal transmission by radio, they had little trouble obtaining frequencies. Nearly the entire spectrum above the standard broadcast (AM) band, then ending at 1,500 kHz, was available, although techniques for transmitting at these high frequencies generally were not then known. An associate of one experimenter

complained that during the 1920s "there were no usable radio channels broad enough to carry the television signal required for adequate detail in the received image." Accordingly, in 1928, the FRC made the first provisions for television—*within* the standard broadcast band. Since these 10 kHz-wide channels were of no practical use to television, the allocation was changed to five 100 kHz-wide channels in the 2–3 MHz band. Despite the wider channels, some promoters agitated in 1929 for the return of visual broadcasting to the AM band, where transmission characteristics and equipment were familiar. This move was successfully opposed by radio broadcasters, networks, and manufacturers. Although transmissions on the 2 MHz band could travel thousands of miles, the FRC maintained at a 1930 television conference (1) that the pressure of other services and the need for a wider band-width for all-electronic scanning and higher definition would soon force television from the 2 MHz band and (2) that, to expand successfully, television would have to take over the largely uncharted spectrum above 30 MHz. The logical position that television would have to find its home in the VHF band was taken seriously, and many experimenters and manufacturers started to investigate the properties and the implications of use of the higher frequencies.

The willingness of financiers to back television in the late 1920s and the 1929 pleading with the FRC for television space on AM channels were not altruistic. Promoters saw television as the next great get-rich-quick opportunity. Pamphlets and magazines carried flamboyant articles urging the general public to "get on the bandwagon" and exaggerated claims of television's spread. They implied that experimental television stations (18 of them in cities such as Chicago, Boston, New

York, and Detroit by 1931) were broadcast stations serving the public and quoted often questionable surveys indicating far more television receiving sets in homes than other sources estimated. Jenkins alone claimed an audience of "some 25,000 lookers-in scattered throughout the States."

Programming was sketchy. A New York newspaper carried weekly program listings of four New York stations and one in Boston that largely presented test patterns and inexpensive or free motion picture short subjects for irregular brief periods. But attempts at more imaginative programming began early with a production of *The Queen's Messenger*, an old melodrama, over the GE station in Schenectady, New York, on September 11, 1928.

Although television seemed to be imminent, opposition by larger radio broadcasters and manufacturers delayed its arrival and then the Depression dried up capital. The Depression also gave radio broadcasting a chance to expand its audience and profits, accumulating funds for later investment in television, and gave manufacturers time to learn more about electronic television.

4.2 Stations: Structure and Stagnation

The number of radio broadcasting stations on the air declined in the late 1920s and early 1930s, from a high of 681 in 1927 to a low of 599 in 1933. While the Depression was a major factor beginning in 1932–1933, as business generally slowed down and advertising-based radio followed, a glance at the numbers (see Appendix C, table 1) shows that the major decline took place in 1928 and 1929 *before* the Depression began. The number of educational stations also declined from the 1927 total of 100 as schools could no longer afford them.

This precipitate decline was due not so much to economic factors as to the establishment of the Federal Radio Commission (FRC) early in 1927 (see 4.81). The FRC's first accomplishment was to lessen interference, which had become acute after the 1926 *Zenith* decision (see 3.82) by setting up a classification system that distinguished stations by type and service, reassigned many stations, and eliminated portable, low-power fringe operations. By late 1928 interference was greatly lowered and the quality of the remaining stations was improved by requirements for 100 percent modulation, crystal frequency control, and the like. Nighttime interference (see Appendix B, under Allocation, Assignments, Licensing) was cleaned up largely by forcing stations to curtail hours on the air and use lower power at night. All these decisions now had the force of law, and the FRC could revoke a broadcasting license—a power that Secretary of Commerce Hoover lacked earlier in the decade. The elimination of channel jumping and unauthorized power changes by early 1928 brought stability. The Federal courts consistently upheld the FRC, establishing a firm legal base for its subsequent actions.

Another development of this period was a steady increase in station transmitting power. Not only was higher power seen as a way of overcoming natural static, but also, as more stations came on the air, it became necessary just for a station to be heard. Where, in 1927, 28 percent of all stations used less than 100 watts, six years later only 3 percent were as low as 100 watts. Where in 1927 only three stations were using the 30,000-watt maximum, by 1933 22 stations were using 50,000 watts, the limit for AM stations established in 1928 and still in effect today (see 5.22). Stations WGY in Schenectady (General Electric), WEAf, New York (RCA-NBC), and

KDKA, Pittsburgh (Westinghouse), were among the first stations to transmit at the new power limit in 1928. In smaller communities, however, power ratings of 250 and 500 watts were the norm, with some of 100 watts or even less. Some man-made interference, often caused by oscillating receivers, and lots of natural static still plagued radio, but FRC regulatory actions had lessened it.

Both regulation and the trend toward more power and better equipment led to higher operating costs for nearly all stations. This increased economic burden, coming just before and during the Depression, brought about important changes in station ownership. The typical small operators of the 1920s, in some instances running five- and ten-watt stations in their homes or garages for a couple of hours a week, could not meet the costs of keeping a license, improving equipment, and paying for programming as well as other increasing demands on time, energy, and money. Many hobbyists and other shakily financed operators were forced off the air; many educational stations crumbled. In their places came the commercial broadcasting companies, groups of people in business solely to operate radio stations. Not gone, but declining numerically, were the laundries, hotels, department stores, and restaurants that operated broadcasting stations as a sideline. Only in the smaller cities and towns did radio bring the carefree aspect of its first years into the 1930s. In bigger cities, business methods and operators were converting it into an advertising-based, money-making industry.

Newspaper ownership of radio stations grew from approximately 5 percent of all stations in the mid-1920s to 13 percent by 1933, demonstrating that other media were recognizing radio's importance as a means of communication.

Newspapers were both hedging their bets in the news communications competition and seeking prestige in their communities by having a hand in the new enterprise. Typical examples were the *Milwaukee Journal*, which had reported on the growth of radio in the early 1920s, purchased station KWAF in 1927 for its frequency assignment, junked its equipment, and gone on the air with new equipment and higher power in mid-1927 as WTMJ (*The Milwaukee Journal*); and the *Chicago Tribune*, which in 1924 took over a station that had had three owners in two years and renamed it WGN (*World's Greatest Newspaper*).

4•3 The Rise of National Networks

The national networks as we know them developed in the late 1920s from the temporary and experimental networks put together earlier in the decade (see 3.3). They were to affect radio development more than any other organization besides the federal government.

4•31 Creation of NBC

The network of stations based on AT&T-owned WEAF in New York operated successfully while the Telephone Group and Radio Group were negotiating in 1925–1926 (see 3.23). In May 1926, AT&T made its broadcast properties a semi-independent subsidiary, the Broadcasting Company of America, both to pressure the Radio Group into granting more concessions to AT&T on matters other than broadcasting and to prepare for the expected purchase of their stations by RCA. Announcement of initial agreement in July 1926 caused consternation among the closely knit staff at WEAF, and numerous problems developed in merging the oper-

An Era Begins (1926)

Announcing the National Broadcasting Company, Inc.

National radio broadcasting with better programs permanently assured by this important action of the Radio Corporation of America in the interest of the listening public

THE RADIO CORPORATION OF AMERICA is the largest distributor of radio receiving sets in the world. It handles the entire output in this field of the Westinghouse and General Electric factories.

It does not say this boastfully. It does not say it with apology. It says it for the purpose of making clear the fact that it is more largely interested, more selflessly interested, if you please, in the best possible broadcasting in the United States than anyone else.

Radio for 26,000,000 Homes

The market for receiving sets in the future will be determined largely by the quantity and quality of the programs broadcast.

We say quantity because they must be diversified enough so that some of them will appeal to all possible listeners.

We say quality because each program must be the best of its kind. If that ideal were to be reached, no home in the United States could afford to be without a radio receiving set.

Today the best available statistics indicate that 5,000,000 homes are equipped, and 21,000,000 homes remain to be supplied.

Radio receiving sets of the best reproductive quality should be made available for all, and we hope to make them cheap enough so that all may buy.

The day has gone by when the radio receiving set is a plaything. It must now be an instrument of service.

WEAF Purchased for \$1,000,000

The Radio Corporation of America, therefore, is interested, just as the public is, in having the most adequate programs broadcast. It is interested, as the public is, in having them comprehensive and free from discrimination.

Any use of radio transmission which causes the public to feel that the quality of the programs is not the highest, that the use of radio is not the broadest and best use in the public interest, that it is used for political advantage or selfish power, will be detrimental to the public interest in radio, and therefore to the Radio Corporation of America.

To insure, therefore, the development of this great service, the Radio Corporation of

America has purchased for one million dollars station WEAF from the American Telephone and Telegraph Company, that company having decided to retire from the broadcasting business.

The Radio Corporation of America will assume active control of that station on November 15.

National Broadcasting Company Organized

The Radio Corporation of America has decided to incorporate that station, which has achieved such a deservedly high reputation for the quality and character of its programs, under the name of the National Broadcasting Company, Inc.

The Purpose of the New Company

The use of that company will be to provide ... best program available for broadcasting in the United States.

The National Broadcasting Company will not only broadcast these programs through station WEAF, but it will make them available to other broadcasting stations throughout the country so far as it may be practicable to do so, and they may desire to take them.

It is hoped that arrangements may be made so that every part of national importance may be broadcast widely throughout the United States.

No Monopoly of the Air

The Radio Corporation of America is not in any sense seeking a monopoly of the air. That would be a liability rather than an asset. It is seeking, however, to provide machinery which will insure a national distribution of national programs, and a wider distribution of programs of the highest quality.

If others will engage in this business the Radio Corporation of America will welcome their action, whether it be cooperative or competitive.

If other radio manufacturing companies, competitors of the Radio Corporation of America, wish to use the facilities of the National Broadcasting Company for the purpose of making known to the public their receiving sets, they may do so on the same terms as accorded to other clients.

The necessity of providing adequate broad-

casting is apparent. The problem of finding the best means of doing it is yet experimental. The Radio Corporation of America is making this experiment in the interest of the art and the furtherance of the industry.

A Public Advisory Council

In order that the National Broadcasting Company may be advised as to the best type of program, that discrimination may be avoided, that the public may be assured that the broadcasting is being done in the fairest and best way, always allowing for human frailties and human performances, it has created an Advisory Council, composed of twelve members, to be chosen as representative of various shades of public opinion, which will from time to time give it the benefit of their judgment and suggestion. The members of this Council will be announced as soon as their acceptance shall have been obtained.

M. H. Aylesworth to be President

The President of the new National Broadcasting Company will be M. H. Aylesworth, for many years Managing Director of the National Electric Light Association. He will perform the executive and administrative duties of the corporation.

Mr. Aylesworth, while not hitherto identified with the radio industry or broadcasting, has had public experience as Chairman of the Colorado Public Utilities Commission, and, through his work with the association which represents the electrical industry, has a broad understanding of the technical problems which measure the pace of broadcasting.

One of his major responsibilities will be to see that the operations of the National Broadcasting Company reflect enlightened public opinion, which expresses itself so promptly the morning after any error of taste or judgment or departure from fair play.

We have no hesitation in recommending the National Broadcasting Company to the people of the United States.

It will need the help of all listeners. It will make mistakes. If the public will make known its views to the officials of the company from time to time, we are confident that the new broadcasting company will be an instrument of great public service.

RADIO CORPORATION OF AMERICA

OWEN D. YOUNG, Chairman of the Board

JAMES G. HARBORD, President

ations and personnel of Radio Group station WJZ and Telephone Group station WEAJ. The following month, RCA absorbed WCAP, Washington, which had been sharing time with RCA's WRC. On September 9, RCA formed a new corporation, the National Broadcasting Company (NBC), with ownership held by RCA (50 percent), GE (30 percent), and Westinghouse (20 percent), naming as president Merlin H. Aylesworth, former managing director of the National Electric Light Association—who did not even own a radio at the time. On November 1, NBC turned over to the Broadcasting Company of America a check for \$1,000,000, which consummated the purchase of WEAJ, took AT&T out of the broadcasting business, and firmly established NBC. Partly to broaden public interest plans for the network-to-be, and partly for public relations, NBC appointed an advisory council of 12—later 19—distinguished Americans to advise it on programming. This committee, proving to be more valuable for its public relations and publicity contributions than for its real effect on network operations, was disbanded a decade later, without fanfare.

The "permanent" network era of radio broadcasting was inaugurated the night of November 15, 1926, with a program presented live—as were all-network programs until the late 1940s—before 1,000 guests in the Grand Ballroom of the Waldorf-Astoria Hotel in New York. Aylesworth was master of ceremonies for the four-hour program, which originated in the ballroom—singers, orchestras, comedy teams—and from *remote* pickups in other cities—a singer in Chicago, Will Rogers from Kansas City. Newspapers reported that this extravaganza cost \$50,000 to produce, half for talent and the rest mostly for technical arrangements, but Aylesworth later admitted that most of the

talent appeared free in return for the publicity. Twenty-one affiliates and four other stations carried the program, which originated at WEAJ and was heard as far west as Kansas City. The stations, most of them independently owned but formerly affiliated with the old AT&T network, were connected by 3,600 miles of special telephone cable.

In the same period, NBC took over operation of RCA's WJZ in New York as the base for a second network, which would incorporate the old Radio Group network. In December the second network was announced, and, on January 1, 1927, it joined the WEAJ-based network in a broadcast of Graham McNamee's play-by-play coverage of the Rose Bowl game between Stanford and Alabama (a 7-7 tie). The WJZ-based network's first coast-to-coast hookup had only six affiliates. The WEAJ-based chain became known as the Red network, and the WJZ-based chain as the Blue. How this came about is not clear, but some say that AT&T engineers kept the network routings straight on a map by coloring the circuits for one red and the other blue.

A third NBC network was begun in April 1927. The Pacific Coast Network, stretching from Los Angeles to Seattle, was based on stations KGO and KPO in San Francisco, and was primarily organized for sales rather than programming. It lasted only until late 1928, when NBC began fulltime coast-to-coast programming on both Red and Blue, eliminating the need for separate West Coast programming.

In October 1927 headquarters of NBC and operations for both WEAJ-Red and WJZ-Blue were moved to new quarters at 711 Fifth Avenue. Eight studios, four of them two stories high, with elaborate sound-proofing, allowed simultaneous broadcasting, recording, and re-

hearsal. Since the studios were tightly sealed from one another and from their own control rooms, special air conditioning had to be installed.

In May 1930, with the short-lived unification of GE–Westinghouse–RCA interests, RCA took over full control of NBC operations. Two years later RCA gained complete ownership when NBC became one of the corporate entities that it retained after a 1932 antitrust consent decree separated the radio manufacturers' operations. Within five years of its establishment, NBC was planning to move its operations into Radio City, a central building in the new Rockefeller Center complex in midtown New York City. Indeed, this expression of confidence, in the middle of the Depression, caused the name Radio City frequently to be applied to the entire center. The new headquarters in the 70-story RCA Building were occupied late in 1933, combining almost all New York operational facilities of NBC, except the transmitters of the New York stations, using the most up-to-date equipment.

By 1933, NBC owned 10 stations outright, seven using 50,000 watts and all but one licensed for unlimited time operation. There were two stations each in the cities of New York (WEAF, later known as WRCA and now WNBC; and WJZ, later WABC), Chicago (WMAQ and WENR), San Francisco (KPO and KGO), and Washington (WRC and WMAL) plus one station each in Denver (KOA, later sold) and Cleveland (WTAM, later WKYC). In a city with two owned-and-operated (O & O) stations, one would be affiliated with the Red Network, the other with the Blue. Besides their O & O stations, the networks had affiliations with many independently owned stations, some of which contracted (affiliated) with one of the two networks and some of which joined either network for a particular broadcast depending on

demand from the advertisers, the network, or the station. In 1927, 22 stations were affiliated with the Red Network, and 6 with the Blue, for a total of nearly 7 percent of all stations. By 1933, Red had 28, Blue had 24, and 36 were supplemental; these 88 stations constituted nearly 15 percent of all stations at that time. Although the two networks were of similar size in 1933, NBC-Red had the pick of stations and programs, and far more advertising income (see Appendix C, table 2). Having two affiliates in each of most large cities also gave NBC an advantage over independent stations and competitive networks. By programming one affiliate against the other and by engaging in competitive price cutting that few independent stations could afford, NBC developed a strong lead in the industry—a role that became the focus of an important investigation a few years later (see 5.3 and 5.83).

4•32 *CBS Develops*

The birth of NBC's major competitor, the Columbia Broadcasting System, Inc., was far more complicated and drawn out. It probably began at the fourth convention of the National Association of Broadcasters in September 1926 when promoter George A. Coats, speaking before 25 to 30 delegates, called for a broadcasting program bureau as a way of lessening the industry's reliance on ASCAP music (see 3.83). Within a month—which also saw the announcement of NBC—one of the audience, Arthur Judson (who died at ninety-three early in 1975) had organized the Judson Radio Program Corporation in New York. As business manager of the Philadelphia Orchestra, and with good contacts throughout the entertainment field, he hoped to sell cooperative booking of talent to the NBC networks. But NBC turned him

down, and Judson considered establishing a rival radio network.

Late in January 1927, when both NBC networks were operating, Judson and three other stockholders, including Coats, formed the rival United Independent Broadcasters, Inc. Like NBC, the company's purpose was to purchase time on radio stations, sell time to advertisers, and provide programming. Coats and another stockholder accomplished the first aim when they negotiated with Dr. Leon Levy, owner of WCAU in Philadelphia, a weekly price of \$500 for 10 hours of station time. Soon, they had 12 prospective affiliates—with WOR, which covered the New York area from its Newark, New Jersey, location, as the key station—at a total commitment of \$6,000 a week in time charges alone. The network had no income as yet, and no figures for the costs of AT&T-supplied wire connections and programming material. The shaky condition of this "paper network" led AT&T to deny line service to UIB for fear that it would be unable to pay its bills.

Now came a series of providential rescues. A rumor was flying in the phonograph industry that RCA was going to merge with the major recording firm Victor Talking Machine Company, then in desperate straits because of obsolescent technology and radio competition. (The two firms did merge early in 1929.) Hearing the rumor, Victor's chief competitor, the Columbia Phonograph Corporation, became interested in a possible merger with UIB. This situation was analogous to the financial "raid" on Western Union in the late 1870s involving the National Bell Telephone Company (now AT&T) as a means of exerting pressure (see 1.43). The scenario in 1927 was different. UIB, with 16 signed-up stations, now had commitments of \$8,000 a week just for time. On April 5, 1927, the record company and UIB

merged their resources, while retaining separate corporate identities, and created the Columbia Phonograph Broadcasting System, Inc. The agreement gave the network \$163,000 in cash to start operations. In return, the record firm gained some operational control over the radio network, stealing a march on its rival, and the station-network identification title, which it hoped would sell phonographs and records.

During the summer, CPBS secured AT&T line service and finally, after nearly a year of gestation and several postponed opening dates, went on the air September 25, 1927, with a broadcast from the Metropolitan Opera of *The King's Henchman*, with the composer-critic Deems Taylor as narrator. The network's problems were reflected in the debut program, which, besides its postponements, was afflicted halfway through by a violent thunderstorm, adding electrical static to financial concern. The Judson Radio Program Corporation, which had retained that part of the business, was supposed to provide programs, and UIB had to pay stations for time, whether or not there was a sponsor to cover costs. After losing \$100,000 in the first month, the record company opted out of the merger, and again the fledgling network seemed to have reached the end of its string.

Arthur Judson went to WCAU owner Levy to seek a way out. Levy and his brother, in turn, while purchasing some shares, persuaded millionaire sportsman Jerome H. Louchheim to buy control of UIB, in spite of a negative reaction from Louchheim's lawyer. With the added funds, UIB was able to guarantee payments to the telephone company for several months. On November 19, Columbia Phonograph Broadcasting System became plain Columbia Broadcasting System, with UIB and CBS briefly existing side-by-side

for the purpose of operating a radio network. One of UIB's key officials, pioneer announcer J. Andrew White, even persuaded the affiliate stations to take a lower weekly guarantee for their 10 hours in order to give CBS a chance.

However, CBS losses continued as advertisers flocked to the increasingly successful NBC. Louchheim and the Levys advanced money as it was needed for operation, and more shares of stock were issued to Louchheim and the Levys to cover their advances. After a couple of months with the network, the new backers got cold feet and offered the controlling interest in CBS-UIB for sale.

A purchaser was already on the scene. In one of its first time sales, CBS had contracted with the Congress Cigar Company of Philadelphia, through the latter's young vice president, William S. Paley, son of the firm's owner, for a series of 26 programs to advertise La Palina cigars. The show started in 1928, and in short order there were highly satisfactory results. On September 28, 1928, Paley, with his own money and money from his family, bought a controlling interest in CBS for approximately \$300,000. He planned to take a six-month leave of absence from the cigar company, get CBS-UIB in better shape, and then go back to selling cigars. He changed his mind in only three weeks—and ran CBS for nearly half a century, stepping down as chief executive only in the spring of 1977. Additional family investments, including \$400,000 for flagship station WABC (now WCBS) in New York in December 1929, brought the total to \$1.5 million, but Paley created a business worth hundreds of times what his family paid for it, largely through his ability as a negotiator, first with affiliates and then with the stars that made CBS programming famous (see 5.3 and 7.61).

Paley's first change was to merge

the two existing networks into one—Columbia Broadcasting System, Inc. He increased the amount of outstanding stock and sold it to get badly needed liquid reserves. Station contracts were changed in March 1929 so that the network paid stations \$50 for each hour actually used rather than \$500 a week for ten hours regardless of the time used, and the stations paid the network for sustaining (nonsponsored) programs provided—which they often sold to local sponsors. This way, it was felt, both stations and network would be lowering their financial sights until the operation was on its feet. Paley retained Judson and White as program advisers.

CBS achieved permanent status in September 1929, just a year after Paley had taken over, when it moved into the top ten floors of 485 Madison Avenue, where it remained until the mid-1960s. Another sure sign of success was the increasing number of its affiliated stations from 17 (4 percent of all stations) in 1928 to 91 (nearly 16 percent of all stations) in 1933 (see Appendix C, table 2).

The CBS network, like both NBC networks, depended on its stable of O & O stations for major and predictable income. By 1933 CBS owned seven stations, one each in New York (WABC, later named WCBS), Washington (WJSV, later sold), Cincinnati (WKRC, later sold), Chicago (WBBM), Charlotte, North Carolina (WBT, later sold), Minneapolis (WCCO, later sold), and St. Louis (KMOX). All these stations operated unlimited time and were broadcasting with 50,000 watts of power by the early 1930s.

4•4 The Decline of Educational AM Radio

Although educational AM stations had proliferated in the early 1920s to more

than 200, almost all of them had left the air by the end of the decade. Their problems began in 1925, mainly because of financial pressures on the schools, increasing greatly during the Depression, school administrators' indecision and lack of purpose and interest, and share-time commercial broadcasters' efforts to gain air time and stifle competition for listeners. Under this load, educational stations dropped out at an increasing rate after 1926. An added factor was the cost of providing programming and making major technical improvements in order to meet the FRC requirements of 1927-1928 (see 4.81). Some educational stations were sold to commercial interests that promised to air educational programs, a few converted to commercial operation, and most simply went off the air. Even with a handful of new stations in the 1926-1933 period, particularly in 1927 and 1928, the number of operating educational standard broadcast stations dropped steadily from 98 in 1927 (approximately 13 percent of all stations) to 43 in 1933 (about 7 percent).

Since the possible benefits from using radio as a teacher were not recognized at first, preference being given to traditional teaching methods, money went in other budgetary directions, particularly because there were not enough trained and interested personnel and support from college and university administrations. Besides the high costs of revising facilities to meet FRC technical standards, the FRC's 1927-1929 reallocations and elimination of marginal stations (see 4.82) often gave channels to commercial operators at the expense of educational institutions. Commercial stations had more lobbying clout and, in many cases, appeared to be more stable. Commercial stations sometimes promised regular free time to educational institutions if the school's educational station would go off the air—and then

dropped the educational programming once they were in control.

Concern for their dwindling numbers and interest in new ways of using radio effectively led radio educators to the formation of national groups. In mid-1929, the Advisory Committee on Education by Radio was formed with backing from the Payne Fund, the Carnegie Endowment, and J.C. Penney, but it died before 1930 without having had much effect. In 1930, two rival organizations appeared that would represent educational radio for ten years: the National Advisory Council on Radio in Education and the National Committee on Education by Radio. The *Council* worked with grants from the Rockefeller Foundation and Carnegie Endowment and called for time on commercial stations to meet educators' needs. The *Committee*, with support from the Payne Fund, asked that nonprofit educational operations fill 15 percent of all station assignments—more than twice the number then on the air—attacked "commercial monopolies," and disagreed with the "halfway" measures of the Council.

The controversy over educational radio's predicament led, in 1932, to a Senate-mandated survey of educational programs on both commercial and noncommercial stations. Having carefully timed their survey for National Education Week, when commercial stations typically scheduled educational programs, the FRC found that commercial stations were adequately filling educational needs. Congress was not yet convinced (see 5.4), and 12 of the few remaining educational stations began in 1933 to take advertising to meet costs and cover ASCAP music licensing fees.

Although the future for educational stations looked bleak, radio still performed a number of educational functions. Beginning in early 1929, the Payne Fund supported daily *Ohio School of the Air*

broadcasts on commercial station WLW for in-school listening. The Ohio state legislature appropriated money for some production—in the studios of WOSU, Ohio State University's station—of this series of instructional programs with related teacher guides and pupil materials, which was later carried over WOSU. Another early educational series for below-college classroom listening was the *Wisconsin School of the Air*, which began on university-owned WHA in fall 1931. WHA started a *College of the Air* two years later. The national commercial networks also regularly scheduled some educational programs.

During the years 1927–1933, the heyday of educational radio ended and the few remaining stations began a period of limited experimentation. Many educators, acutely aware of their lost opportunities, searched for other broadcast outlets, debated the issue nationally, and scrambled for local funds and facilities. Despite problems of money and policy, educational radio's champions kept a foothold in American broadcasting.

4.5 Depression Radio Advertising

In the Depression, and partly because of it, advertising became the accepted means of support for radio stations and the expanding networks. Advertisers turned to radio even while retrenching in other media purchases, because radio's audience grew larger and more loyal as it had less money for other leisure-time pursuits. Large stations and the networks began to make appreciable profits, paving the way for new programs and more promotion.

4.51 Advertising Becomes King

Radio became an accepted medium of mass advertising in 1928 because:

(1) coast-to-coast network coverage carried programs to 80 percent of the nation's homes; (2) far less mutual interference and reduced time-sharing—down to a fraction of an hour per day in some cases—made listening more enjoyable; (3) better and less expensive radio receivers led to larger audiences; (4) the first scientific radio listener research was underway; (5) potential advertisers recognized radio's commercial role and value as a result of successful campaigns; (6) major national advertising agencies showed increasing interest in radio; and (7) the public accepted advertising on networks in 1927–1928. NBC had nearly forty sponsors that year, as CBS was struggling with four, but the following year their combined total was sixty-five. Many stations were still losing money, but the pattern was set and favorable.

The Depression pushed down many of the last barriers to *direct* advertising. Advertising had begun on radio as a genteel sales message broadcast in "business" (daytime) hours, with no hard sell or mention of price. Under the pressures of a Depression economy stations began to accept more and longer ads—including some fifteen- and thirty-minute "programs" of advertising content—harder selling ads, and even barter ads, whereby stations traded time for hard goods they could use. Advertising spread to all hours of the broadcast day, and evening *prime time* hours with the most listeners commanded the highest prices.

Broadcast advertising, both on and off the networks, became so complex that a number of middleman institutions evolved for the mutual benefit of sponsors and radio stations or networks. First were advertising agencies, which typically had considered radio a fad in the early 1920s before radio carried much advertising. One 998-page book on advertising published in 1923 dismissed radio broadcasting in two

sentences: "The development of radio broadcasting is presenting another possibility of mass communication which probably will be utilized for advertising purposes. It is too early to predict what its possibilities may be or how successfully it may be used."¹⁴ With national programs on major networks becoming more complicated to produce, and more expensive, the axiom of "he who pays the piper calls the tune" came into full operation. First, agencies merely purchased air time for their sponsor clients, and stations or networks continued to develop programs. Soon, however, some agencies engaged in production in an attempt to create a profitable *package* of program and advertising pleasing to the sponsor. The networks concurred. Without having to worry about either production or pleasing the sponsor, they reaped their normal income by simply providing air time for the finished product. By 1931-1932, the agencies had taken on program selection, casting, direction, and other production aspects on networks and a few larger stations, frequently renting studios from the former. In smaller markets and stations, apart from the influence of network programs supplied to affiliates, the agency role was restricted pretty much to purchase of time and placing of sponsor ads.

Except for network advertising, purchasing time on stations across the nation was difficult and time-consuming. Few local stations could afford to have full-time representatives in New York and other big cities where advertisers and advertising agencies were located. Hence, they took to hiring a firm to represent them and paid it a commission—nominally 15 percent of the involved time sales, after the 15 percent advertising agency commission

had been deducted—on national advertiser time or spot sales. The first true station representative (rep) firm, Edward Petry & Co., was formed early in 1932 to help local stations sell time in the major cities. Before that, most rep firms were brokers for sponsors, by playing off one station against another. (Advertising agencies also originally were brokers, which accounts for their income typically coming from commissions paid by the media rather than fees paid by the sponsor.) The new type of rep firm would represent only one station in a market and "sell" it to a sponsor through its agency. Station reps existed to serve their media clients, not the sponsor. This practice gave important individual stations more national and regional advertising business, since sponsors' agencies and stations' reps bought and sold station time with the idea of getting the widest coverage for a product message—sometimes with programs, sometimes with spot advertising—without having to concern themselves with programs. Of little importance at first, station reps had an increasing financial impact later in the decade.

Broadcast advertising was becoming more sophisticated. By the early 1930s, an advertiser could prerecord messages on electrical transcriptions and mail them to many stations, often for simultaneous use. Even though the networks stuck to their ban on recordings in either program or advertising material, the volume of broadcast advertising increased. Advertising copy became more versatile as agency copywriters vied with one another for the best approach for a given client. Sometimes agencies turned to research for ideas and answers, but other times the sponsor—or his wife—made decisions by intuition.

According to McCann-Erickson data, radio advertising volume climbed from about 2 percent (\$20 million) of ad-

¹⁴Daniel Starch, *Principles of Advertising*. Chicago: A. W. Shaw, 1923, p. 866.

vertising expenditures in 1928 to nearly 11 percent (\$75 million) in 1932 (see Appendix C, table 4). Even though the deepening Depression caused an advertising decline of \$10 million a year later, this reduced the volume by only half a percentage point. Radio had obviously become an important element of the advertising "mix," and much of this gain was at the expense of newspapers and magazines.

In 1932, an FRC study of advertising time found that, overall, 36 percent of air time had commercial sponsorship—and 78 percent of that was local advertising—leaving 64 percent unsponsored or *sustaining*; that is, the station or network sustained the program's production and time costs. This pattern varied little by station

size or power. Sustaining time was slightly more prevalent before 6 P.M., mainly because radio was only just beginning to offer regular daytime programs.

4•52 *Network-Station Economics*

The table below indicates that network broadcast advertising expanded sharply in the 1927–1930 period. By 1932, the Depression was causing the networks either to hold their own or decline in most categories of advertising. Since less commercial time was supporting a larger number of sustaining hours, the amount of time sold was crucial to the entire medium.

Network management originally

The Economics of Network Advertising: The First Six Years / The following figures show the expansion of national advertising on CBS and the NBC-Red and -Blue networks combined.

Year	Money Expended for Time on All Networks		Commercial Time as Percentage Total Hours Broadcast		Net Pretax Income of All Networks	
	\$	% Increase	%	% Increase	NBC Red and Blue	CBS
1927	\$ 3,832,150	—	20.5	—	\$(464,400)	\$(220,100)
1928	10,252,497	167.5	27.7	35.1	427,200	(179,400)
1929	19,729,571	80.6	24.7	(10.8)	798,200	474,200
1930	26,819,156	43.2	29.2	18.2	2,167,500	985,400
1931	35,787,299	33.5	36.5	25.0	2,663,200	2,674,200
1932	39,106,776	9.3	25.5	(30.1)	1,163,300	1,888,100

Sources: First four columns from Herman S. Hettinger, *A Decade of Radio Advertising* (Chicago: University of Chicago Press, 1933), Tables 19, 20, and 23 on pages 113–118; last two columns from FCC, *Report on Chain Broadcasting* (Washington: Government Printing Office, 1941), pages 17, 24. Data for 1927 in last two columns includes two months of 1926 for NBC but only eight months of 1927 for CBS. Figures in last two columns rounded to nearest 100. Data in parenthesis indicates loss.

thought—or at least said—that they would not make money. NBC President Aylesworth expressed this belief to a Senate committee in 1927, but one year later the network made a half-million-dollar net profit. CBS had a rockier start, offering no effective competition for nearly two years to the two NBC chains, with their 75 stations. As shown in the table, however, all three chains, especially because of their O & O stations, soon began to make healthy profits.

In 1932 and 1933 the newer CBS surpassed NBC, in number of stations and income, before they resumed a rough parity. RCA and NBC officials claimed that this income discrepancy was due partly to NBC's providing public service programs, which were typically sustaining, while CBS made money on sponsored entertainment programming. This position was not supported by the facts; all three networks produced many public service programs. The networks' Depression-caused income decline after 1931 occurred when businesses that were losing money pared advertising expenditures as an initial economy. Surprisingly enough, radio increased its income during the first two years of the Depression. The fact that it was "free" once the set was bought created a large audience. This audience, supplied to advertisers at a small price per thousand, created such a tempting market that they stuck with radio as long as they could, particularly for high volume—low unit cost merchandise or services.

Local stations suffered more. Many faced business communities buttoning down for the Depression and showing little interest in a new advertising medium. Potential advertisers often waited to see results and gain experience from network advertising, agencies were just starting to get interested in radio, and reps were a new business. At the same time, though,

an increasing flow of books, articles, and talks on how best to advertise on radio persuaded many advertisers to take the initial plunge during this period.

Gross receipts varied from a few hundred dollars per station to more than \$1.5 million, for an industry total of \$18.5 million. Networks earned another \$37.5 million, giving radio broadcasting a total income of nearly \$56 million in 1931. However, the industry spent more than it earned by several hundred thousand dollars. Of the 513 stations reporting to the FRC for 1931, 333 reported a profit ranging from \$14 to \$376,000 while the remaining 180 stations were in the red, with losses ranging from \$22.50 to \$178,000 for a firm operating two stations. Radio was making and spending a lot of money; networks and their O & O stations accounted for half and all other stations for the other half. Income had risen rapidly from less than \$5 million in 1927 to nearly \$56 million just four years later, thanks to the formation of three networks and acceptance of advertising by the business community and the listening audience. More than six thousand persons worked in radio stations and networks in 1930–1931.

4.6 Developing Program Diversity

In 1928, radio offered more features, less education, more plays (up to 4.2 percent), and fewer children's programs than in 1925 (see 3.6), but generally the time devoted to particular types of programs remained proportionately similar for years. A 1928 study of 100 stations in the western United States by Federal Radio Commissioner Harold Lafount showed that the average station was on the air 54 hours a week, with 1 hour of network programs, 25 hours of studio programs, 7 hours—only 13 percent—of "mechanical" (records

and electrical transcriptions) programs, 4 hours of orchestras from remote locations, 8 hours of religion, 5 hours of education and lectures other than on farm subjects, 3 hours of farm reports, talks, and so forth, and 1 hour of weather and stock reports.

Although music remained the mainstay of both networks and independent stations, programming on radio after 1927 developed two distinct types: network, usually more lavish and diversified, and local, mainly music and sometimes recorded. The majority of programs were sustaining throughout the 1927–1933 period. In 1926–1927, the first season of formally organized networks, more minutes of a sample January 1927 week were devoted to concert music (585) than to musical variety and light music (570). All other programming together—general variety, news and commentary, religious, homemaker and miscellaneous talk programs—occupied only 420 minutes a week. In other words, the two NBC networks—CBS was not yet on the air (see 4.32)—programmed only 26 hours a week, or about three and one-half hours per day.

Like individual stations before them, networks programmed at first only in the evening hours. As the supply of programming, the interest of advertisers, and the demands of affiliated stations increased, they added daytime hours, pretty much filling them by 1933. In the process of expansion, most major network program types made their appearance (see Appendix C, table 6).

4•61 Variety

Heavily sponsored from the start, radio variety programs grew in number and importance throughout the 1926–1933 period. The so-called *general variety* show, a sort of magazine of entertainment, was

first programmed in 1926–1927 and reached daytime schedules as early as 1929–1930. “Radio’s first really professional variety show,” which started in October 1929, was the Fleischmann Yeast program, featuring the young crooner Rudy Vallee. Popular from the start, it remained with the same sponsor for a decade. Hillbilly and country-western variety also started early, with *Dutch Masters Minstrels* appearing in 1928–1929 and the even more famous *National Barn Dance* reaching a national audience late in 1933. This type of programming, which had begun earlier on local stations in the South, soon became popular all over the country through network distribution. Combination orchestra and talk formats, or *semivariety*, appeared in the 1930–1931 season. Newspaper entertainment columnist Ed Sullivan, whose subsequent television variety program ran for more than two decades, made his first broadcast series appearance in the 1931–1932 season.

Also popular were *comedy variety* programs, usually composed of a comedian or comedy team with a backup orchestra. On NBC’s first season, Smith Brothers cough drops made use of their famous two faces trademark with a comedy team named “Trade and Mark,” backed by an orchestra. Reflecting the social standards of that period, *Majestic Theater: Two Black Crows* featured two white actors playing Negroes and was very popular in the 1928–1929 season and for several years thereafter. In 1931–1932, one of the early big stars, “Banjo Eyes” Eddie Cantor, began a comedy-variety series that drew high ratings for more than ten years. The next season saw a parade to the network microphones of soon-to-be-famous radio comedians, many of whom were former vaudevillians. Al Jolson, famous as the singer in the early Hollywood talkie *The Jazz Singer*; George Burns and Gracie Allen, a husband and wife team; Ed Wynn,

fresh from *The Perfect Fool* on Broadway; Jack Benny; Fred Allen, who was to maintain a fake feud with Benny for years; the Marx Brothers, best known for their movies; and Jack Pearl, who created on radio the German tall-tale teller, Baron Munchausen—all appeared in their own network shows for the first time that year. Most of these comedians lasted on radio for a decade or more, Burns and Allen and Benny each for more than thirty years on radio and then television. Each added his or her own bit to radio's traditions; Wynn's program, for instance, introduced studio audiences to provide reaction to liven the program (see 3.65) and distract Wynn from the frightening microphone. Comedy shows all had orchestras and typically used

"second bananas" (a burlesque term) or "sidekick" foils (or "straight men") but relied most heavily on comedy sketches and monologues.

Local stations also depended on variety programming, although it was usually sustaining. As vaudeville tours played to dwindling paying audiences and stalled all over the country, many troupes turned to local radio for short-term employment. Some performers left the traveling circuit altogether and began to work in radio, full time if possible, although pay often was only food and shelter. On many stations local talent was even cheaper, as anyone with any musical or comedy accomplishment was invited on the air just to fill time. One such early starter was

An Evening's Network Programming: 1930 /

These are evening schedules for WEAf (NBC-Red's flagship station) and WABC (the key CBS station), both in New York. Blank time periods indicate that the previous program continues. Programs with an asterisk are sustaining (not sponsored). Naturally, programs would vary from night to night.

Tuesday, November 4, 1930

	WEAF	WABC
6:00	*Black and Gold Room Orchestra	*Harry Tucker and his Barclay Orchestra
6:30	*Who's Behind the Name?	*Crockett Mountaineers
6:45	*Black and Gold Room Orchestra	*Tony's Scrap Book
7:00	Air Scoops with Elinor Smith (Daggett & Ramsdell Co.)	*Columbia Educational Features
7:15	*Laws that Safeguard Society	Westchester County Salon Orchestra (Westchester Realty Board)
7:30	Soconyland Sketches (Standard Oil Co. of New York)	Wise Shoe Program (Wise Shoes, Inc.)
7:45		*The Early Book Worm— (Alexander Woolcott)
8:00	*Troika Bells	Blackstone Program (Waitt & Bond, Inc.)
8:15	*Snoop & Peep	
8:30	Florsheim Frnic (Florsheim Shoe Co.)	Kaltenborn Edits the News (S. W. Straus & Co.)
8:45		Premier Salad Dressers (Francis H. Leggett & Co.)
9:00	Eveready Program (National Carbon Co., Inc.)	Henry and George (Consolidated Cigar Co.)
9:30	Happy Wonder Bakers (Continental Baking Corp.)	Philco Symphony Concert (Philadelphia Storage Battery Co.)
10:00	Enna Jettick Songbird (Dunn & McCarthy Co.)	Graybar's Mr. and Mrs. (Graybar Electric Co.)
10:15	B. A. Rolfe and his Lucky Strike Dance Orchestra (American Tobacco Co.)	Paramount-Publix Radio Playhouse (Paramount-Publix Corp.)
11:00	*Mystery House	
11:15		*Will Osborne and his Orchestra
11:30	*Vincent Lopez and his Hotel St. Regis Orchestra	*Columbia's Radio Column
12:00	*Duke Ellington and his Cotton Club Orchestra	*Mickey Alpert and his Orchestra from Boston
12:30	Jack Albin and his Hotel Penn- sylvania Orchestra	*Asbury Park Casino Orchestra
	*Sustaining program	*Nocturne—Ann Leaf at the Organ

Source: "Radio Advertising," *Fortune* (December 1930), page 113. Courtesy of Fortune Magazine.

(Arthur) "Red" Godfrey, known in Baltimore radio as the "warbling banjoist," who was later to find great success in radio and television. Formats generally were informal, although some stations tried to create low-cost versions of well-known network shows.

4•62 Music

Music programs were the most important content of networks and local stations in respect to hours aired per week. As with variety programs, there were several types, but the usual program was built around an orchestra or a singer specializing in popular or light classical music. These programs usually had sponsors from the start and, as early as 1926–1927, many bore the sponsor's name in the title as in *Cliquot Club Eskimos* and *Michelin Tiremen*. Some performers sang under "house names," but the audience soon recognized such voices as that of the mysterious "Silver Masked Tenor," Joseph M. White, of the Goodrich Silvertown Orchestra, who never sang without his mask.

At first, orchestras alone were most popular in network music programming, but after 1930 the audience apparently began to prefer light musical variety programs. These were variety shows built around singers or orchestras rather than masters of ceremony or comedians. Most ran 15 or 30 minutes, and some were used as sustaining filler between sponsored shows. Falling in this category were the vaudeville-derived song and patter teams discussed in 3.62 and the early radio appearances of famous crooner Bing Crosby in 1931.

Sponsors sought and gained prestige through broadcast concert music. The Atwater Kent Sunday evening music hours began on the old AT&T network in 1925

and stayed with NBC for several years. The Boston Symphony Orchestra, Chicago Civic Opera, and National Symphony Orchestra joined another half-dozen concert orchestras in the first (1926–1927) network season. The New York Philharmonic, conducted by Arturo Toscanini, who later conducted NBC's own symphony orchestra, made its first radio broadcasts in fall 1927—a year that saw some 20 "concert music" programs. Until the late 1940s the networks always scheduled at least 20 such programs, usually sponsored by prestigious firms. (As television came in during the early 1950s, the number of concert music programs dropped slightly but rose again later, although mostly for sustaining programs, until network radio essentially ceased to exist.) One program that still goes on is the Saturday afternoon broadcast of the Metropolitan Opera, which started in the fall of 1931. Announcer Milton Cross (see 3.6) gave the commentary on these broadcasts from their start until his death in 1974. Many other concert music programs had large audiences and long life: NBC's *Music Appreciation Hour*, with noted conductor Walter Damrosch as host, became an educational hit over the Blue network during Friday morning school hours after 1928; and the Mormon Tabernacle Choir broadcast live from Salt Lake City weekly for more than 40 years.

As local station schedules expanded to 12- and 18-hour broadcast days in larger cities, music became increasingly important. Music of all kinds comprised 50 to 60 percent of most schedules, with popular and semiclassical works predominating. The specific sound varied tremendously, depending on local talent, audience composition, competition on the air, and network affiliation, if any. Musical programs were nearly always live, with orchestras and soloists playing in studios or at remote pickup locations. The still strong

anti-record stigma on the networks sometimes filtered down to local stations (see 3.8).

Although announcers of musical programs sometimes performed so well that they became radio personalities, some listeners found commercials and talk annoying. In 1928–1929 a Chicago firm attempted to overcome these drawbacks to radio music, which most listeners preferred to the home phonograph, by providing a musical service over telephone lines for a fee—a throwback to the Puskás brothers' service in Budapest (see 2.5).

4•63 Drama

Of all radio program types, drama had the slowest start; broadcasting theater to an unseeing audience was difficult for both actors and audience. The initial efforts were light “homey or love interest” half-hour shows, leading in a few years to the women’s serial. The first of these, in late 1929, was the ethnic, immensely popular *Rise of the Goldbergs*, written by Gertrude Berg, who also starred as “Molly,” as even her friends came to call her over the years. This program, built around the doings of an urban Jewish family, helped establish the idea of a continuing cast in a different situation each week. *Vic and Sade* was another popular example of this genre, lasting from 1932 to 1945. An increasing number of these light programs originated from Chicago. The first program from the West Coast was the supremely popular *One Man’s Family*, which originated in San Francisco in April 1932. Serial drama established a daytime standard of several 15-minute programs—three at first, five later—a week in 1932–1933. By spring 1933, daytime *soap opera*—so called because of the soap company sponsorship common to the genre—included long-lived

Helen Trent and *Ma Perkins*. All these, written by a handful of writers, would have long runs, *Ma Perkins* continuing until 1960, and were the prelude to a flood. The soap opera was a true serial, with stories slowly unfolding day after day, over years.

Comedy drama usually presented standard characters getting into and out of various situations week after week, each episode being complete in itself. The first and most famous, however, began as a two-character dialogue. Freeman F. Gosden and Charles J. Correll, who had started together in vaudeville, created a blackface routine in return for free meals from a small station in a Chicago hotel. The *Chicago Tribune’s* station, WGN, then hired the pair for nearly 600 episodes of their *Sam ‘n’ Henry* act over the next two years. With success came an unsuccessful demand by the performers for more money, and Gosden and Correll moved to WMAQ. When WGN refused to release the program name to a competitor, the performers had to come up with a new one. Thus, *Amos ‘n’ Andy* came into being, with the two vaudevillians playing all the parts in an increasingly complicated series built around the Freshair Taxicab Company and the fraternal lodge Mystic Knights of the Sea. Although the program was carefully scripted, with even the pronunciation written in, it usually was aired without rehearsal in order to maintain spontaneity. Five-minute bits on 78-rpm records were both officially and unofficially syndicated to smaller stations. The whole show went to NBC-Blue in summer 1929 for a reputed \$100,000 a year for the team. It was well worth it. *Amos ‘n’ Andy* quickly became a craze and then an institution. Almost everyone tuned in five, and later six, nights a week, and movie theaters were known to interrupt films for 15 minutes so that the audience could hear the evening’s episode. While blacks would find the dia-

Types of Programs Broadcast in 1932 / Shown below are the program types broadcast by nine major-market radio stations (four in New York, four in Chicago, and one in Kansas City) in a two-week period in February. When compared to 1925 data, there have been declines in music and "other" categories and an increase in drama and other entertainment (see table on page 73). Compare this also with Appendix C, table 6, to see what the networks were programming in 1932.

Program Type and Subtypes	Percentage of Time
Music	64.1%
Dance	23.5%
Vocal	13.0
Combination	3.6
Concert orchestras	8.4
Soloists	4.5
Phonograph records	3.2
String ensembles	3.3
Sacred	.6
Miscellaneous	4.0
Drama	6.5
Continued plays, reading, etc.	2.0
Sketches	3.3
Onetime plays	1.2
Other Entertainment	13.3
Women's	4.9
Children's	3.5
Feature	4.0
Star (other than music)	.9
Information	12.1
Education	7.2
News	1.2
Political	1.4
Market reports	.5
Weather	.1
Sports	1.7
Other	4.0
Foreign-originated	.5
Health exercises	.6
Church services	2.2
Miscellaneous	.7
Total	100.0%

Source: William Albig, *Modern Public Opinion* (New York: McGraw-Hill, 1956), Table 20, page 447. By permission.

logue insulting today, a large number, as well as the country's white majority, enjoyed it in its time. Many suggest that this program helped more than any other to sell radio to advertisers and the public alike. Other comedy programs came and went, but *Amos 'n' Andy* remained popular for many years.

Thriller drama—action, western, crime, and suspense—began about the same time. The first was *Empire Builders*, a semi-informative show sponsored by a railroad and heard only in the Midwest in its first (1928–1929) season. In 1930, the western came to radio with *Death Valley Days*, an anthology of tales introduced by a host, which retained its format in television a quarter-century later. In 1931, the

crime program began with *Sherlock Holmes*, which remained on network radio for many years with different casts, straying far from the Arthur Conan Doyle original. The classic crime drama was *The Shadow*, whose chief character, Lamont Cranston—played at one time by Orson Welles—was a “wealthy young man-about-town” who had a “hypnotic power to cloud men’s minds so they cannot see him.” The invisible effect was created aurally and psychologically by putting Cranston’s voice through a filter that made it sound like a telephone conversation. For two decades a bloodcurdling laugh and the slogan “Crime does not pay . . . the Shadow knows!” identified the Shadow. *Little Orphan Annie*, based on the comic strip, took

Amos 'n' Andy / Though racist in today's view, this comedy helped to propel network radio into faster and wider acceptance in the late 1920s and early 1930s, with the comic misadventures of two taxi drivers and their friends and relations. Freeman F. Gosden and Charles J. Correll, originators of *Amos 'n' Andy*, were white—but are shown here in blackface. Photo courtesy of National Broadcasting Company, Inc.



to the air in fall 1931, the first of many children's adventure serial programs.

A very different kind of drama began in 1931 when the weekly newsmagazine *Time* created a radio program. Whether the *March of Time* should be classified as drama or news has been a source of argument. Each program contained the three or four most easily dramatized events of the week before, with actors selected to sound as much as possible like the personages they portrayed. In the late 1930s, pressure from the White House forced the removal of a sound-alike for President Roosevelt. The program's signature, announcer Westbrook Van Voorhis's impressive vocal "Time . . . marches on!" became a catch phrase.

Drama was rare on local stations, because of the costs of good talent and production, but some stations tried amateur dramatic presentations and a few became known nationally for their dramatic programs. For example, WXYZ in Detroit rapidly built a following with *The Lone Ranger*, a western program mainly for children, which started in 1933. The program soon became a factor in the formation of the Mutual network (see 5.3). Local stations offered other dramatic programs by means of *syndication*, whereby one station or studio produced a program series and then sold or rented recordings of it to local stations elsewhere. This procedure permitted stations in smaller and more remote towns to have professional drama without network dependency. The opposite also occurred, with local acts eventually receiving national exposure through syndication. For example, a comedy team known as "Smackouts" began with small bits on the air in Chicago, graduated to the network level *National Farm and Home Hour*, and later achieved national success with a family show of their own as *Fibber McGee and Molly*.

4•64 News

Prior to 1930, the public could hear Frederick William Wile, David Lawrence, and H. V. Kaltenborn in separate once-a-week news commentaries and expect radio to inform it in times of high public interest or tension. This was demonstrated by the attention listeners gave to bulletins that were issued on Charles Lindbergh's solo airplane flight across the Atlantic. But regular *hard news* broadcasting, as it is known today, did not exist until Lowell Thomas began a 15-minute newscast five times a week on NBC-Blue in fall 1930—which was aired until early in 1976. Kaltenborn soon switched to three times a week, and in 1932 Boake Carter and Edwin C. Hill adopted similar 15-minute formats. The networks had no daytime newscasts during this period.

In its coverage of the Lindbergh baby kidnaping in 1932, radio showed a new responsibility. The networks scrapped evening schedules for several days to bring details—although NBC had waited a day, thinking the news too sensational for even brief bulletins. The positive audience reaction to such occasional reporting and the regular newscasts made network planners realize that news could be a powerful ingredient in programming. Coverage of the 1932 presidential campaign (see below) strengthened this feeling.

During this period, radio received its hard news mostly from the wire services, Associated Press, United Press, and International News Service, which were controlled by the newspaper industry. The nation's press, already feeling the competition for advertising revenues, became alarmed over radio's small incursions into news reporting. When newspaper pressure made the wire services unavailable to radio, CBS began its own newsgathering, frequently ignoring the copyright law with

a copy of a newspaper, scissors, and paste, in mid-1933. Rival NBC tried telephone inquiries, but both the Blue and the Red networks relied primarily on the wire services—when they could get them.

Late in 1933, tension between print and broadcasting came to a head, with the newspapers holding the high hand. Many papers stopped free listings of radio programs, demanding payment for such “advertisements.” In a major agreement signed in December at New York’s Biltmore Hotel between the newspaper industry and the networks, radio stations were restricted to (1) issuing only two five-minute newscasts per day, at 9:30 A.M. and 9 P.M. or later, to protect both morning and afternoon papers; (2) broadcasting interpretation and comment as opposed to hard news reporting; (3) using news provided by the Press-Radio Bureau, a new service to which the wire services would funnel copy for rewriting in radio style; (4) depending *only* on the new Press-Radio Bureau, stopping their own newsgathering activities, and (5) broadcasting only unsponsored news. Radio had to accept the agreement, since it was a relatively new business supposedly dependent on the wire services controlled by newspapers for hard news and since newspaper ownership of many stations divided the radio industry.

The Press-Radio Bureau came into existence on March 1, 1934, and immediately ran into competition. As only the networks had signed the Biltmore Agreement for radio, many independent stations and affiliates decided to set up separate newsgathering operations not bound by the agreement. Of those established, Transradio Press Service, headed by the former director of the CBS News Service, quickly became the largest.

Within a year, with less than half the radio stations subscribing to the Press-Radio Bureau and its restrictions, the news-

paper industry realized it was losing. The directors of commercially based INS and UP—AP was a cooperative, owned by member papers—decided to sell news to radio stations without restriction, if the competition warranted. It did; thus, after about a year, the Biltmore Agreement was effectively dead. Few local stations broadcast hard news programs during the 1926–1933 period although some newspaper-owned outlets gave brief headlines. Radio was primarily for entertainment rather than information, and except for local highlights, most stations let newspapers handle news.

4•65 *Election Broadcasting*

Radio’s election coverage, which dated back at least to 1916, continued to expand. In the 1928 campaign between Republican Herbert Hoover and Democrat Alfred E. Smith, governor of New York, approximately \$2 million was spent on radio for national and local candidates, with the Democrats outspending the GOP for national candidates by more than \$200,000. The new practice of charging candidates for time—remember, few stations sold time for any purpose in 1924—accounted for much of the rising cost, and the increased use of radio time—especially the one-minute spot announcements pioneered by the Republicans—for the rest. Neither candidate was an ideal radio speaker, but Smith’s constantly mispronounced “radio” was probably most noticeable. On election eve both candidates made one-hour nationwide broadcasts, Hoover from his home in Palo Alto and Smith from New York City. Election night was a network affair, with both NBC and CBS interjecting news reports into special entertainment programming. Most national and local election reports were sustaining.

Four years later, in the midst of the Depression, the incumbent Hoover took on another New York governor, Franklin D. Roosevelt. Although the GOP used nearly twice as much time on national radio as in 1928, the new medium could not change political reality, and F.D.R. soundly beat Hoover. It is estimated that the two parties spent upwards of \$5 million on the radio campaigns, with 25 percent going for national hookups. Election night broadcasts resembled those four years earlier, but they began earlier—6 P.M. instead of 8 P.M.—and included analysis as well as returns.

4•66 Other Talk Programs

Various kinds of talk shows filled many hours a week, especially during the day, as network schedules expanded. In these years, only special sports events were covered in play-by-play detail, and some local stations broadcast more than others. From the beginning of network programming, religious programs were prominent, especially multid denominational services and talks. Harry Emerson Fosdick began a long-running Protestant program, which became *National Vespers* on NBC-Blue in 1929. The *Catholic Hour* appeared a year later. Of a different order, though still professing to be a religious program, were the CBS commentaries of Catholic priest Charles E. Coughlin. Broadcasting from his Shrine of the Little Flower in Royal Oak near Detroit, Michigan, beginning late in 1930, the program grew out of a regional broadcast first aired in 1926. Discussing economics and politics as well as his religious views, the “radio priest” backed Roosevelt fervently until F.D.R. was elected and his policies had crystallized. Then Father Coughlin turned against F.D.R. and became a notorious “rabblouser” (see 5.64).

Talk programs led the way into

daytime programming, with cooking, beauty hints, gossip, and other shows designed for the housewife. The long-running *National Farm and Home Hour*, produced with U.S. Department of Agriculture help, began in fall 1928. *Cheerio*, an inspirational talk show, began a long career the same season. Walter Winchell started his celebrated gossip show on NBC-Blue in 1932.

Both major networks offered educational programs. NBC introduced its *Music Appreciation Hour* (see 4.62) in 1928, and CBS followed in February 1930 with its *American School of the Air*, a sustaining program except for the first three months. Both of these programs aimed at classroom listeners. In 1932 the *American School of the Air* reached some twenty thousand schools with a number of different course offerings each week. The *National Farm and Home Hour* and the *March of Time* were typical of generally educational programs.

Most local stations placed talk programs between musical presentations. Astrologers, children’s storytellers, cooking teachers, gossipers, advisers—all found their way to the air. More than 1½ percent of air time was devoted to health exercise programs until 1932. Some stations became famous for a particular talk program—such as the Kansas station that broadcast a “medical question box” (see 4.83)—and some stations offered a particular type of program—such as local sports coverage in towns with college or professional teams, even though there was some fear of radio’s effect on gate receipts.

4•7 Audience: Craze to Consequence

Radio’s real impact in the 1926–1933 period occurred in the growing radio audience. By 1928–1929 the home radio tinkerer had given way numerically to the

family that purchased a ready-made receiver, plugged it in, and listened. By 1933 about two-thirds of the nation's homes had radios (see Appendix C, table 8). Once a mystery and a novelty, radio listening had become the habit of millions.

4•71 *The Changing Receiver Market*

By 1928 there were about sixty makers of radio broadcast receivers in the country, two of which had one-third of the market, and four of which had two-thirds. In addition to GE and Westinghouse, important independent producers included Atwater Kent, which turned from making automobile ignition systems to building radios in a huge factory in Philadelphia, and Grigsby-Grunow, which built a reputation on its console "Majestic" model, turning out 5,000 sets a day in its Chicago plant in 1929. Stromberg-Carlson turned from telephone equipment to fine, expensive receivers, and Crosley, owner of WLW, Cincinnati, began at the other extreme, making inexpensive receivers that most could afford.

In 1927-1928 the heavy, large, expensive to operate, and inconvenient battery-operated receiver became obsolete, as alternating-current (plug-in) sets became available except in places without power lines. By May 1928 it was estimated that 7½ million of the nearly 12 million radio receivers in use were the "standard" type, with loudspeakers—the others being crystal sets or obsolete one-tube models. The radio audience was reportedly nearly forty million out of a total population of 120 million. Receivers became furniture, the larger loudspeakers sounded better, and prices went up in a boom market, peaking in 1929 at \$136 for an average set. The result was overproduction by perhaps a million units. Manufacturers, faced with unloading these sets in the Depression,

dropped prices to below \$90 in 1930 and to an average of \$47 by 1932. Many makers and retailers went out of business, and others began to produce smaller and cheaper sets including table models.

Competition grew as the Philadelphia Storage Battery Company (Philco), driven out of most of its radio battery business by plug-in circuits, converted quickly to making radio sets and tubes. Tube production was very important, as tubes—costing at least a dollar or two apiece—were sold separately from receivers until the mid-1930s. RCA, because of its patent position, sold perhaps 60 percent of all radio tubes until 1931, when Philco stopped buying from RCA in a fight over specifications and price, and started to make its own. In 1934 Philco had attracted 20 percent of the tube market compared to RCA's 40 percent. But Philco already outshone other radio manufacturers by producing fully one-third of *all* receivers manufactured in the country, having completely converted to the superheterodyne circuit in home and automobile radios. Though the new circuits were more expensive, volume production drove prices down and markets up. In 1933, when the Depression caused lower sales of expensive radios, many makers, notably Crosley and Emerson, made small tube radios to sell for less than \$15—an unheard-of price for anything but a crystal set a year or so earlier. Quality suffered, but the audience grew nonetheless. To a great extent, radio circuits became standardized, and experimentation with new or expensive models decreased. Consoles still were made, but smaller table receivers predominated.

4•72 *Development of Audience Research*

Little was known about the radio audience except that it was growing. The 1930 U.S. Decennial Census collected in-

formation about radio ownership, showing that, while half the urban families in the country had receivers, only 21 percent of rural farm and 34 percent of rural non-farm families had. Receivers were concentrated in the Northeast, in midwestern cities, and in the Far West. Penetration of radio ranged from New Jersey's high of 63 percent to Mississippi's low of 5 percent of families. Of special interest was the increase in farm listeners, as the spread of electricity to rural areas made fast, direct communication possible for the first time—especially important in a national crisis like the Depression.

The first system of program ratings appeared in 1929, when Archibald M. Crossley (no relation to Powel Crosley, Jr., the WLW owner and set maker) formed the Cooperative Analysis of Broadcasting (CAB) to find out how many persons listened to NBC and CBS programs. This service, which benefited advertising agencies but was paid for largely by networks and stations, was the standard for five years. Crossley researchers would call a preselected sample of homes the morning following the program(s) to be rated and ask whoever answered "who had listened to what" the night before. The rating produced by this technique—a percentage of set-owning families listening to one program or network—was applied only to sponsored shows, as the service was established for the Association of National Advertisers. Noting that ratings were costing about forty cents a call, CAB tried a postcard system but got only a 3 to 5 percent response rate. Dividing each day into four parts, CAB then investigated which program was turned on. It found that most people listened to radio at night: fully half the sets were in use at 9 P.M. and 10 P.M., with perhaps a third at 7 P.M. and 11 P.M.—establishing the concept of *prime time*.

Local stations began to conduct

audience research under pressure from advertisers who demanded such information before they would purchase time. Most stations were content to solicit reactions to programs and read incoming mail. Others, using FRC-required engineering surveys of their coverage area, simply thought of the population residing within the coverage area as their audience. Under increasing sponsor pressure, they acknowledged that such figures did not reflect actual listenership, and turned to active methods of discovering audience loyalty and interest. Stations variously made free premium offers, to boost audiences and to gauge their size; analyzed set sales figures, to establish the size and approximate location of the potential audience; and mailed questionnaires that sought data on audience size, preferences, and basic demographic characteristics. A few larger stations sent out interviewers to collect the same data. Although costly, personal interviews avoided a sampling bias of telephone interviews: only about half the American homes had telephones in the early 1930s. The stations that interviewed by telephone started using both recall and coincidental—calling when the program was on the air—methods around 1930.

Most broadcasters, however, had too few sponsors and too little money for this kind of effort. Thus, throughout the 1927–1933 period, little was known about radio listeners' reactions. While ratings were affecting network programs, local stations still made programming decisions and placed advertising without much knowledge of their audience.

4•8 Regulating Order out of Chaos

After the 1926 Zenith decision (see 3.82), Secretary of Commerce Hoover figuratively threw up his hands over the

worsening interference situation. His call for industry self-regulation apparently fell on deaf ears. Congress made sporadic attempts to replace the obsolete 1912 Radio Act. In 1926 both houses of Congress finally passed radio bills, but major differences had to be resolved by a joint conference committee. The House bill called for the Secretary of Commerce to have strong licensing authority, with a new Federal Radio Commission (FRC) to serve as a board of appeal from the secretary's decisions. The Senate bill called for the FRC to have the licensing authority. Facing the delay of the joint conference committee, and the Christmas recess, Congress passed a stopgap bill giving all broadcast stations ninety-day licenses, which could be renewed only if the station waived all rights to a specific frequency. But the new Christmas radios of 1926 still received a vast amount of unchecked interference from nearly seven hundred stations.

4•81 *The Federal Radio Commission*

The Radio Act of 1927 was passed on February 18 and sent to President Coolidge, who signed it into law on February 23. It created a Federal Radio Commission of five members, appointed to overlapping six-year terms and representing five geographical regions of the country. The FRC was to have licensing authority for only one year, in order to straighten out the interference and regulatory chaos, and then the Secretary of Commerce was to regain it as the FRC became an appellate body (but see 4.82).

The House-Senate compromise is clearly reflected in this scheme. The FRC would have initial control over all interstate and foreign radio communications that originated in the United States. Specifically, it would have the power to clas-

sify stations, prescribe the nature of service to be provided, assign frequencies, determine power and location of transmitters, regulate apparatus used, make regulations to prevent interference, set up zones of service (coverage areas), and make special regulations concerning chain broadcasting when necessary; but it would have no power to censor broadcasts. The act established a maximum period of three years for a license, renewable only to those stations adhering to FRC regulations and the law, and revokable for cause. The FRC was to keep radio service relatively equal throughout the country. Its decisions were not absolute but could be appealed to the U.S. Court of Appeals for the District of Columbia.

There were several key assumptions underlying the Radio Act of 1927. Equality of transmission facilities, reception, and service was a political goal. The public at large owned the radio spectrum, but individuals could be licensed to use frequencies. Because the number of channels that could be used without interference was limited, and because the number of applicants was larger than the number of channels, some criterion for choosing licensees had to be devised. Congress labeled this criterion the "public interest, convenience, and/or necessity" but did not define it in the 1927 act. Indeed, it remains undefined in statute to this day. It was the basis, however, on which discretionary control could be built, and it would be defined, however loosely, in the body of case law that was sure to develop. Essential to the operation of this principle was the concept that the broadcaster was ultimately responsible for his operation and that the government would step in only if the licensee did not adequately perform service to the listeners. This was a recognition that earlier self- and governmental-regulation had not worked and that broadcasting was

a unique service requiring unique regulation. Although channels were scarce, radio as a form of expression was covered by the First Amendment and the Radio Act of 1927, thus precluding heavyhanded censorship.

Armed with these powers and restraints, the FRC began to function in March 1927. President Coolidge nominated five commissioners, but Congress approved only three before it adjourned. Two of these, including the chairman, died before the year was out, leaving the FRC with only one salaried appointee for much of its first year. In addition, since Congress had neglected to allocate specific funds for the FRC, the new agency camped out for many months in Hoover's Department of Commerce with a very small staff, much of it lent by the Commerce and Navy departments.

4•82 *Clearing the Interference*

Because the immediate job of reducing interference between stations was primarily technical, many of the original commission members were experts in radio. They included a naval officer—former RCA board member Admiral Bullard, an engineer and editor, a station manager, a radio inspector for the Department of Commerce, and a lawyer; and the earliest replacements were a former educational broadcaster and a set manufacturer. Their work was cut out for them because, in passing the Radio Act, Congress had stipulated that all licenses would expire two months after the act became law. Faced with an April 24 deadline, the FRC first extended amateur and ship licenses indefinitely in order to concentrate on the broadcasting situation. It sent a questionnaire to all stations to determine who was broadcasting where, when, and with what

power. It “summarily removed” some forty stations operating on six frequencies reserved for Canada. It granted temporary extensions—initially for 60 days, later for 90—to most broadcasting stations after April 24, specifying power and times of operation on particular frequencies with minimum 50 kHz separations between stations in the same city. This action went a long way toward moving or eliminating the nearly 130 stations that had been off-frequency when the Radio Act of 1927 was passed (see 3.82).

It soon became clear that merely moving stations around was not going to reduce interference permanently. A classification system similar to that developed by Hoover in the mid-1920s would be necessary. The first step in this direction was a series of FRC general orders, which progressively widened the broadcast band to the entire spectrum between 550 kHz and 1,500 kHz (General Order No. 4); notified portable stations that they would be eliminated by fall but allowed temporary service with up to 100 watts on 1,470 kHz and 1,490 kHz (General Order No. 6); tightened allowable frequency deviations (General Order No. 7); and designated, in preparation for hearings, 600–1,000 kHz as a band to be kept free from heterodynes or other interference (General Order No. 19). Although these steps were constructive, the job was only partly done. The FRC, empowered to act in this way for only a year, had almost run out of time when Congress extended its licensing authority in March 1928 for another year.

Congress added a provision intended to promote equality of service throughout the country and stop the trend toward more stations in the larger eastern cities. Named the Davis Amendment after the Tennessee representative who introduced it, the new law required the licensing authority—the FRC for another year,

and then, presumably, the Secretary of Commerce—to work out means for assigning equal numbers of stations and equal amounts of power and air time to each of the country's five zones. In addition, all commissioners were to be legislated out of office by early 1929, thus putting them in effect on probation to clean up the remaining interference problems. Heedful of the Davis Amendment as well as their basic charge, the FRC, in May 1928, issued General Order No. 32, which was aimed at 164 stations believed to be causing the most interference. After a series of hearings requested by most of the affected stations, the commission removed 109 stations from the air, reducing the total number to around 590 by July 1. Portable

stations were completely eliminated, since they caused traveling interference and insurmountable regulatory problems under the Davis Amendment.

In July and August, the FRC issued the outline of its station classification plan, particularly General Order No. 40. The 96 available frequencies, each 10 kHz wide, were classified. There were to be 40 "cleared" stations, eight per zone, on which only one station would be placed anywhere in the country during evening hours, thus allowing better skywave reception in rural areas. These stations would operate with high power: 25,000 and later 50,000 watts. An additional 35 channels, seven per zone, would provide regional service with only two or three stations on

The FRC Establishes the Basic AM Allocation: 1928

General Order No. 40, issued yesterday by the Federal Radio Commission, supplies the official basis for an adjustment in the assignment of the country's broadcasting facilities, under a plan which it is believed will provide an improved standard of radio reception generally. . . . The plan calls for full-time assignments for 100-watt stations equalling in number the total of all other classes of broadcasters put together. Of the 74 channels made available for high-grade reception, 34 will be assigned for regional service, permitting 125 full-time positions for this type of station, and 40 channels will be assigned to stations with minimum power of 5,000 watts and a maximum to be determined. . . . On these 40 channels only one station will be permitted to operate at any time during night hours, thus insuring clear reception of the sta-

Source: Statement to Accompany General Order No. 40, FRC, August 30, 1928 as reprinted in 1928 *Annual Report of FRC*, pages 49–50.

tion's program up to the extreme limit of its service range.

A majority of the commission believes that this plan is the best which could be devised with due regard to existing conditions. It provides, or at least makes possible, excellent radio reception on 80 per cent of the channels. The few other channels will suffer from heterodyne interference except in a small area close to each station.

Source: FRC *Annual Report* (1928), page 17.

The basic plan of allocation of regular broadcast facilities placed into effect by the Federal Radio Commission has been continued unchanged insofar as concerns the general plan of allocation of stations by frequencies, power, and hours of operation.

Source: FCC *Annual Report* (1935), page 23 (first report of the FCC).

each regional frequency using no more than 1,000 watts. The remaining 21 channels were either for low-power (100 to 5,000 watts) local stations, with many stations per frequency, or reserved by international agreement for Canada or Mexico. Claiming that this plan, which although modified still governs AM station assignment, would allow "excellent reception on 80 percent of the channels," the FRC re-assigned existing stations in November 1928.

Once again, just as the FRC was beginning to have some major effect, its licensing authority was about to expire. Once again Congress extended it, this time to the end of 1929. A shift from technical to legal problems was apparent in congressional approval of an FRC general counsel and legal staff. By mid-1929, the FRC staff of nearly one hundred persons had more than tripled in one year. Since it was also clear that some of the FRC's functions were less temporary than originally conceived, the FRC licensing authority was extended at the end of 1929 "until such time as is otherwise provided by law." To handle broadcasting's complexities, the country needed a body able to put congressional policy determinations into regulations, administer those regulations, and adjudicate disagreements.

Even with license extensions and reduced interference and number of stations, the FRC still had to equalize radio service in the country's five zones as called for by the Davis Amendment. When it tried quota systems, given states usually ended up with portions of stations, an obvious impossibility. In 1930, it devised a system whereby every broadcast station received a number of points reflecting its power and time on the air; but even with some station changes, radio service remained "under quota" in the South and Far West and "over quota" in the Midwest and Northeast. It became obvious to many

that the FRC was spending an inordinate amount of time trying to overcome financial, political, and technical problems in order to meet Congress's arbitrary and politically stimulated requirements. Except for the equalization issue, however, the FRC had effectively dealt with interference by the early 1930s and was ready to pursue legal and programming issues.

4•83 *Improving Content*

An early FRC programming concern had been the airing of phonograph records, which were considered to be inferior to live music and hence "deceptive" to the audience (see 3.8) as well as generally available in stores and thus wasteful of air time. General Order No. 16 of August 1927 required clear identification of such "mechanical reproductions" with the exception of electrical transcriptions, which were of better technical quality and could not be purchased by the public. The point was both to improve the sound quality of what was on the air and to avoid wasteful broadcast duplication of commercial records people could play on phonographs.

Between 1927 and 1934, the federal courts—particularly the U.S. Court of Appeals for the District of Columbia—handled some sixty broadcast-related cases, 41 of which involved the FRC's basic role and the constitutionality of all or parts of the 1927 Radio Act. The courts generally were sympathetic to the FRC claim of special expertise and its position that the overriding criterion was to be the "public interest, convenience, or necessity"—general and undefined as that standard was. Unless the FRC ignored evidence or procedural requirements, the court usually upheld it, even if the case involved some aspect of programming.

The appellate courts quickly sup-

ported the right of the FRC to make regulations, and the constitutionality of the law, the commission's right to refuse to grant a license, the public interest standard, power to prevent transfer of ownership, congressional authority to regulate broadcasting, and FRC discretionary powers. Numerous cases touched on programming matters—using a station for personal editorializing and defamatory attacks, overcommercialization, lack of programming balance—and some of the most interesting dealt centrally with programming and the public interest standard.

Four early programming cases stand out. One was that of Dr. John R. Brinkley, who used his Milford, Kansas, station KFKB for a "medical question box" program in which he prescribed his own patent medicines—by number, to be dispensed by his own or friendly pharmacies—for unseen patients and promoted a questionable goat gland male sexual rejuvenation operation. The American Medical Association was particularly displeased, and the FRC eventually failed to renew Brinkley's license—with the reviewing court pointing out in 1931 that consideration of past behavior was not censorship. Brinkley moved to the border town of Del Rio, Texas, and continued broadcasting from Mexico, beyond the writ of the FRC. He was finally forced off the air in 1940 in a frequency reallocation. A similar case was that of Norman Baker, whose license in Muscatine, Iowa, was not renewed in 1931 because he used station KTNT to make "bitter attacks" on persons with whom he disagreed, as well as to exploit his medical theories and practices, and to promote his cancer hospital and merchandise. The Brinkley case figured as a precedent in the Baker decision. In the 1930 case, William B. Schaeffer was denied renewal for his Portland, Oregon, station KVEP because he allowed former political candidate Rob-

ert Duncan to attack his former opponent and backers over the air with "indecent and obscene" language. Schaeffer contended that, once having sold the time to Duncan, he was no longer responsible, but the commission insisted that the licensee has to maintain control over material aired over the station. The Court of Appeals determined that this FRC dictum did not constitute censorship, and Schaeffer went off the air. Another case involving content was that of the Reverend Robert P. Schuler of the Trinity Methodist Church in Los Angeles, licensee of KGEF. Schuler had been convicted of attempting to use radio to "obstruct orderly administration of public justice" in "sensational rather than instructive" broadcasts, as he attacked religious organizations, public officials, the courts, institutions, and individuals in violent language. Citing the Brinkley case, the Court of Appeals upheld the FRC, and the Supreme Court refused to review.

The FRC established important technical, procedural, and legal precedents which still stand today. In 1932 it stopped issuing general orders and codified a set of rules and regulations, some of which provided precedent for its successor organization. In its seven years, the FRC cleared away the worst of the growth period's interference, established detailed regulations and standards, and made them stick in a series of important court cases. Broadcasting gained the solid regulatory underpinning even broadcasters agreed was needed.

4•84 *Development of Self-Regulation*

The fledgling National Association of Broadcasters (see 3.83), which had fought for creation of the FRC, because established stations had most to lose from unrestrained competition, worked with it

throughout the FRC's seven years of life. Up to the late 1920s the NAB had primarily fought ASCAP demands (not very successfully), sought technical regulation, and acted as an information exchange and trade organization to promote radio. Now it added lobbying for commercial broadcasting's interests before Congress and the FCC, and pushing self-regulation of the industry to disarm rising governmental and public concern. The NAB feared that a Pandora's box had been opened now that the government had, and intended to use, the power to regulate *all* radio stations closely. On March 25, 1929, the NAB convention approved NAB's first Code of Ethics, a brief statement of general dos and don'ts relating to programming and advertising practices. The major aim of the code was to prevent the broadcast of fraudulent, deceptive, or indecent programs or advertising material that might offend any group of listeners. Distributed to NAB members only was a Code of Commercial Practice, which called for most advertising to be aired before 6 P.M. and for only "goodwill" or institutional advertising to be broadcast in prime time hours.

4•85 *Music Licensing*

As in the 1920s, however, NAB's major concern was ASCAP's demand for higher royalties; in early 1932 the increase asked was an estimated 300 percent. Though it tried to establish a solid broadcaster front, NAB was undermined when ASCAP offered a lower rate to newspaper-owned stations—a successful attempt to divide and conquer as well as ingratiate the press. After many newspaper-owned stations took this bait, other broadcasters had to sign and pay greatly increased rates for music. NAB again tried to set up a competitive music licensing agency, but its

Radio Program Foundation soon died of broadcaster disinterest.

4•9 A Growing Social Impact

Radio was becoming a major institution. In 1933, high school and college students nationwide debated the question "Resolved: that the United States should adopt the essential features of the British system of radio operation and control," informing many people about the good points and the shortcomings of both systems. During the latter part of the 1926–1933 period, a large radio trade press developed. The most important advertising/business-oriented journal, *Broadcasting*, began as a twice-monthly periodical in 1931 and today is the weekly bible for much of the industry. *Variety* moved its radio section to second-place importance in space and location, right behind films, forcing vaudeville to third place. Fan magazines came and went, with one of the best, *Radio Broadcast*, dying during the Depression.

The potential of radio as material for a university course of study was realized in several schools during the late 1920s. Among the first was the University of Southern California in 1929. Most such early courses were in English or speech departments and aimed particularly at basic training for on-the-air announcing. The earliest textbooks on radio also appeared in these years, including books on radio advertising for agencies and advertisers, announcing techniques, and even dramatic scripts.

4•91 *Effects on Other Media*

The Depression, together with radio's grip on people's leisure and money, nearly killed off phonographs and the recording industry. Many smaller companies disappeared because they couldn't

afford to switch from mechanical to electronic recording methods even though they would improve sound quality. The scarcity of capital caused many record firms to merge with stronger companies. Victor merged with RCA in 1929; Columbia Phonograph, weakened by losses during its fling at owning a broadcast network, became part of the American Record Corporation and later CBS, which had achieved strength and size since their previous association. Victor, building on work done for films and radio stations, introduced the 33 $\frac{1}{3}$ -rpm disc in 1931, but the absence of high quality records and a good inexpensive player kept this experiment from catching on. Radio stations used the slower-speed discs, which provided more content per side, but the public had to make do with 78-rpm records for another 17 years.

Broadcast music affected musicians too. Some, like orchestra leader Fred Waring, complained that playing songs on radio hurt record sales; others that radio didn't play or pay them enough. In Chicago, the American Federation of Musicians called a strike to express its concern over radio's effects on musicians' employment (see 6.83).

The print media also felt radio's encroachment. During the "Press-Radio War" (see 4.64), most newspapers dropped free radio program listings and cut radio-related news. Radio's share of advertising placed in the five major media increased from less than 2 percent in 1928 to more than 10 percent by 1933—and much of this increase was at the direct expense of newspapers. Magazines, too, felt the pinch, some of them losing ads to radio as early as 1928.

The motion picture industry was changing over from silent to sound movies. Warner's introduction of sound-on-disc pictures in 1928 and 1929 had thrown

Hollywood into chaos. Picture companies faced not only the immense costs of sound-conversion for the studios and thousands of theaters across the country but also techniques for silencing noisy cameras and protecting fragile microphones and hiding them from view. While radio receivers were shown in a few films, motion picture studios limited the appearance of their contract actors on radio for fear of both overexposure and competition. Like radio, the movie industry did well during the Depression, although it had to endure flurries of cost reduction, give away free dishes, and often lower admission prices. To a great extent, film and radio complemented one another in the 1930s—fulfilling related but not duplicated interests and needs of their audiences.

4•92 *Growth of Radio Abroad*

The series of international radio conferences begun in 1903 (see 2.4) continued. The fourth meeting, postponed from 1917 due to wartime and postwar technical and political changes, was held in Washington in October 1927 with 300 or so delegates from nearly 80 countries. Its job was to minimize the interference caused by the rise in number and power of radio broadcasting and amateur stations. The conference (1) allocated for amateurs specific bands with minimal technical limitations, allowing for flexibility and change; (2) issued new general regulations covering radio in all countries and more detailed supplemental regulations that referred only to nations with government-run radio systems, thus excluding the United States with its commercial system; and (3) set up a technical committee to work on a frequency allocation table for the world. The fifth radio conference, held in Madrid in 1932, was the least important of the series since the 1927 regulations and the world-

wide Depression had limited technical progress and financial investment. However, the conference decided to combine telegraph and radio regulations and to change the name of the International Telegraph Union to International Telecommunications Union.

To the north, Canada had some seventy-five stations by 1927, which provided service to every province although most of the stations, with half the total power, were concentrated in such major cities as Montreal and Toronto. Canada was principally concerned with two problems familiar to American broadcasting—the amount of advertising carried by stations and the lack of radio in rural areas—and one unique to that country—the cultural and social impact of increasing amounts of programming from another country, the United States. In 1928 the Canadian government appointed a study commission to recommend a new system of broadcasting, which was to have far-reaching consequences for the privately owned stations in Canada. An operating body, the Canadian Radio Broadcasting Commission, was established in 1932 to set up a national system of broadcasting and to regulate radio.

To the south, Mexican broadcasting expanded. A limited number of stations in the larger cities were using increasing amounts of power to reach rural listeners. Government agencies placed receivers in schools and workingmen's centers to receive the government-supported educational station. License periods up to 20 years, weak enforcement of the 1926 basic law, and unlimited transmitter power all helped to make Mexico a haven for shady border station operations aimed at United States audiences but free from FRC control. By 1934, 12 such high-powered border stations, including John Brinkley's XER, were operating or under construction.

Radio grew apace in Europe as well as in North America. In Great Britain, the British Broadcasting Company owned by manufacturing companies gave way to the British Broadcasting Corporation on January 1, 1927. This government-chartered monopoly, supported by post office-collected license fees on receivers, set an enduring standard for public service broadcasting. By 1932 United Kingdom radio operations were centralized in the handsome new Broadcasting House in London, although lip service was paid to broadcasting in outlying regions such as Scotland and Wales. Germany and France were advanced in radio, both technically and in station growth. International broadcasting became common in the early 1930s, with Radio Moscow initiating one of the first shortwave broadcasting stations in 1929. In late 1932, England began its BBC Empire Service to the Commonwealth, and France broadcast extensively to its many colonies. The League of Nations opened a shortwave station in 1932. In most European countries, the government either directly operated or chartered and controlled the broadcasting establishment, and supported it by collecting annual taxes on receiving sets in the same way the British government supported the BBC. Advertising rarely was used for support. Short- and longwave frequencies augmented medium-wave ones in Europe because the medium-wave broadcast band used in the United States could not adequately contain and separate the many broadcasting stations and languages of the many countries on the closely packed European continent.

4•93 *Period Overview*

The 1926–1933 period is one of the two most important in the history of broadcasting; only 1946–1952 (Chapter 7)

exceeds its importance in setting present-day patterns of radio and television. Laboratories were experimenting with television, but television broadcasting had not yet been innovated. National radio networks and the FRC developed, creating more than anything else the structural and regulatory basis for broadcasting in the 1970s. Of nearly equal importance, the stabilizing effects of networks and the FRC helped bring on increasing dominance by major advertisers, especially in network broadcasting.

Each of these factors helped bring permanence and standards to what had been a day-to-day fad. Radio now could compete with other media for advertising dollars and audience. The FRC's clearing of technical interference and the wider diversity of programs secured a lasting association of radio with its audience. News and drama made their first appearances on network and major station program schedules.

The importance of this period is underscored when we realize that the 1933

Key Broadcasting Indicators: 1930 / This is the second of ten tables providing comparable information for a 50-year period (to 1975) at five-year intervals. Sources for items 1–5 and 11 are the tables in Appendix C, while other information comes from sources indicated below. Most data are for January 1.

Indicators	Am Station Data
1. Number of commercial stations	569
2. Number of noncommercial stations	49*
3. Total stations on the air	618
4. Number of network-affiliated stations	131
5. Percentage of commercial stations affiliated with networks	23%
6. Total industry income (add 000,000)	\$77*
7. One-hour station rate (New York)	\$750*
8. One-minute station rate (New York)	na
9. One-hour network rate evening,	\$4,890*
10. Number of broadcasting employees	6,000
11. Percentage of families with sets	46%
12. Broadcasting regulatory budget (FRC)	\$295,440

Notes (See Appendix D for full citations):

* = data are for 1931.

na = not available or not applicable.

6. Hettinger (1933), page 109, giving FRC-gathered information for 1931, said to be the first year for which reliable data are available.
7. WEAf, key station of NBC-Red; from Dunlap (1931), page 304.
8. Few stations then sold such brief amounts of time.
9. Basic NBC-Red Network of 20 stations. Blue with 13 stations went for \$1,000 less. Total Red network (54 stations): \$11,350; total Blue network (47 stations): \$10,250. Source as in note 7.
10. Lichty and Topping (1975), table 23, page 290.

broadcast industry was very much like today's in structure, while the industry of 1926—only seven years earlier—was only roughly formed. In this short space of time, broadcasting had been molded to a pattern that would hold for decades to come and to which newer broadcast media, like FM, television, and even cable, would have to adapt.

Further Reading

The best overview of this period, replete with social history and anecdote, is Barnouw (1966), with Archer's two volumes (1938, 1939) providing an RCA-biased view of the big business aspects of radio's organizing years. Good contemporary reviews are found in Goldsmith and Lesca-boura (1930), Codel's collection (1930), the first *Annals* compilation (1929), and the National Association of Broadcasters' industry view of itself (1933).

The best discussions of mechanical television developments are found in Dinsdale (1932), Felix (1931), Moseley's 1952 biography of Baird, Dunlap's 1932 popular work reprinted from his *New York Times* columns, and Sheldon and Grise-wood's volume, the first general-interest American book on television (1929). General technological overviews of television can be found in Maclaurin (1949). For a British point of view, see Pawley (1972).

Early potential and subsequent decline of educational radio are the subjects of Perry (1929), Tyler's national survey (1933), Lingel's bibliography (1932), and Frost's station-by-station history of educational AM licensees (1937a). A short historical review of educational radio is found in Wood and Wylie (1977).

The role and process of radio advertising are the focus of Felix (1927), the first book-length treatment of the subject; the FRC (1932), which compares American

and foreign practice; Arnold (1933), the first to discuss television's potential in detail; and Hettinger (1933), the first scholarly analysis of the early years of radio advertising. Spalding's article (1964) is also of value.

A detailed and interesting discussion of network radio programs, listed in alphabetical fashion, is in Dunning (1976). Network radio content is listed in Summers (1958), and the programs are described and casts listed in Buxton and Owen (1972). Husing (1935) offers an interesting first-person account by a well-known sports announcing personality. Chase (1942) presents a narrative history of radio content, and Settel (1967) does the same thing with pictures and text. The effects of content on the audience are analyzed in Cantril and Allport's pioneering analysis (1935), while methods of audience analysis are reviewed in Lumley (1934).

The most scholarly legal analysis of the Radio Act of 1927 is Davis (1927), which, along with the FRC's annual reports (1927–1933) and Schmeckebier (1932), offers the best review of these critical regulatory years. Kahn (1973) includes some cases mentioned in the text and helps place them in context. See also U.S. Congress, House of Representatives (1972), for a reprinting of the 1927 act as passed and its many amendments.

To understand the impact of radio, read the radio columns or sections of major newspapers or magazines, plus specialized periodicals including *Broadcasting*. See also Buehler (1933) and Aly and Shively (1933) for debate handbooks on that year's comparison between American and British broadcasting. Batson (1930) analyzes broadcast developments in other countries, while Briggs (1965) details developments in Great Britain and Peers (1969) discusses Canadian radio.

Radio's
Golden
Age
(1934-1941)

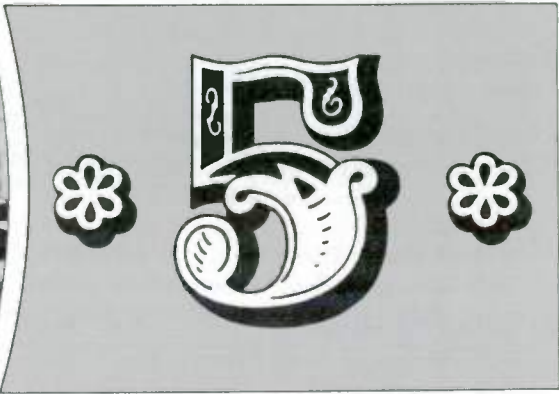


Annrc: "Ladies and gentlemen, I have a grave announcement to make. Incredible as it may seem, both the observations of science and the evidence of our eyes lead to the inescapable assumption that those strange beings who landed in the Jersey farmlands tonight are the vanguard of an invading army from the planet Mars."
—Orson Welles's "War of the Worlds" broadcast, October 30, 1938, on CBS





Radio's
Golden
Age
(1934–1941)



"The country has as many stations as it can support. Additional facilities will necessitate the commercialization of stations to the exclusion of public service."—former FRC Commissioner H. A. Lafount, 1936

In September 1934 tourists swarmed to Asbury Park, New Jersey, to view the blackened hulk of the cruise liner *Morro Castle* lying off the beach, a grisly remnant of the disaster in which 134 passengers and crew had burned to death or drowned. On the beach a horde of salesmen hawk-ing souvenir postcards and candy bars gave shape to former President Coolidge's stand that "the business of America is business." For most Americans, the *Morro Castle* was a distraction from worry over jobs and paychecks. Franklin Roosevelt's New Deal fight to bring the nation out of the Depression had just begun—and the still smoking ship was less depressing and more interesting than the bread lines of the unemployed.

Outline:

Radio's Golden Age (1934–1941)

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But with money still tight and unemployment high, radio came into its own. Once you had a set, radio was free, unlike newspapers, magazines, books, the movies, or the stage. While Americans turned to radio primarily for entertainment, they also absorbed news of conditions in other parts of the country, social upheaval in other parts of the world. They became both politically aware and dependent on radio for information.

Radio reported the sudden disasters—the *Morro Castle*, floods, the assassination of Louisiana populist Senator Huey P. Long in 1935—and slow political change—Hitler rearming Germany, war clouds gathering in the Far East, then in Spain, and finally throughout Europe as Germany lit the match of World War II. In 1936 the king of England used radio to tell the world directly that he was giving up the throne for the “woman I love.”

The radio voice of Franklin Roosevelt carried his plans for the country into the American home, aided by the REA (Rural Electrification Administration), which brought centrally generated electricity, and thus batteryless radio, to most farm dwellers for the first time. He talked about the many federal agencies created to conquer the Depression. Citizens began to turn to Washington for leadership instead of to state capitals—and the federal government responded with new agencies, including the Federal Communications Commission (FCC).

Radio reflected a country that was drinking legally again, with the lifting of Prohibition, and traveling farther—DC-3s were flying coast-to-coast overnight, transatlantic air service was promised, and Pennsylvania was building an unlimited-speed, multilane turnpike. Listeners in Maine knew that duststorms on the Great Plains were blowing away the rich Midwest topsoil, that floods on the Mississippi

and Ohio were threatening river towns, and that persons dispossessed by the duststorms and economic conditions wandered across the country by car or freight train—Okies migrating to California to find a new beginning. John Steinbeck immortalized this saga in his 1939 novel *The Grapes of Wrath*, later made into a movie.

To most Americans, the 1930s brought new leisure. The five-day work week and the eight-hour day were becoming common. More people flocked to the movies every week. Walt Disney's first all-cartoon feature film *Snow White* appeared in 1937, and the highly creative *Fantasia* followed in 1940. The movie version of Margaret Mitchell's *Gone With the Wind* even permitted a spoken “damn”! Such big dance bands as Benny Goodman, Glenn Miller, and the Dorsey Brothers brought swing music to college proms and roadhouses alike, thanks to radio and juke boxes. People also read books. A generation of novelists came to maturity, including Sinclair Lewis, Edna Ferber, Ernest Hemingway, and John Steinbeck. The new picture magazines *Life* and *Look* quickly achieved high circulations.

But perhaps the most popular pastime was radio. This was truly radio's golden age, before competition from television or World War II battlefield reports diverted listeners from the fine entertainers who were starting their broadcasting careers. Radio audiences grew steadily and broadcasting pioneers of the 1920s reaped a considerable profit. Although radio was still innovative and experimental, the medium was no longer novel—it was not only accepted but welcomed.

5•1 Innovations around the Corner

Even during a period of relative stability in the broadcasting industry, seeds

of drastic change were germinating in laboratories across the country. Books and periodicals dwelled on technological improvements that were “just around the corner,” and would change people’s lives as AM radio had in the 1920s—in particular, static-free radio—FM; still pictures by wireless—facsimile; and perhaps most interesting to the public, moving pictures sent to the home by wireless—television (see 5.14). Their respective backers believed that FM radio, facsimile, or television was *the* future of broadcasting, while the AM radio broadcasters feared that confusion and costly innovation would endanger their industry. This conflict was clear by the time this country entered World War II, when the battle in broadcasting had to defer to the battles against Germany and Japan.

5•11 *Invention of FM Radio*

Throughout most of radio’s development, static had interfered with reception, especially during summer thunderstorms and in the semitropical American South. Since the rasping “jumble” caused by lightning was amplitude modulated, a possible solution was to use frequency modulation for radio. Although the concept of FM dated back to the Poulsen Arc (see 2.21) in the early 1900s, experimentation had stopped in the early 1920s because most radio engineers thought that FM’s drawbacks, such as distortion, outweighed its benefits and that the only solution was to overpower static by forcing a huge amount of transmitter power through as narrow a channel as possible. AM stations based their drive for additional power in the 1930s on the same idea (see 5.22).

An important radio engineer who disagreed with this conclusion was Edwin

Armstrong, inventor of the feedback circuit (see 2.22) and other devices. Following his Signal Corps service in World War I, Armstrong began his own search for a way to eliminate static, working at first with his former teacher, Professor Michael Pupin, at Columbia University and later alone. After devoting two years to frequency-modulated radio waves, Armstrong arrived in late 1930 at the key to successful FM broadcasting: the FM broadcast channel had to be many times *wider* than the standard AM channel of 10 kHz. Using a channel 200 kHz wide, with low power, Armstrong got excellent audio frequency response with FM—and virtually no static, even in electrical storms. (Actually, the swing of the modulated FM signal occupied only 75 kHz, but the additional bandwidth protected against interference from adjacent channels due to the instability of receiving equipment on the very high frequencies employed). Armstrong applied for the first four patents on his FM system in 1930 and received them just after Christmas in 1933.

With the basic FM patents secure, Armstrong gave his first demonstration to an outsider. He and David Sarnoff of RCA had known each other for nearly 20 years. RCA had used Armstrong’s earlier inventions, to their mutual profit, and had an option to purchase his new inventions; Armstrong was the largest individual stockholder in RCA, and his wife had been Sarnoff’s secretary. Sarnoff was impressed with FM’s results but also was worried because Armstrong touted his system not as a means of solving the static interference problems of the existing AM radio system but rather as a total replacement for AM. RCA, with its huge investment in AM broadcasting, would not readily undertake the heavy costs of developing a totally new system, especially one that was patented and promoted by someone else.

The First Public Demonstration of FM: 1935 / Edwin Armstrong's biographer Lawrence Lessing provides a gripping account of the first public demonstration of what FM could do. Remember, electrical storms and other disturbances could ruin AM station reception then—and many felt the only answer was greater power. Armstrong's audience was made up of fellow engineers, who listened to the inventor's highly technical paper with no hint of the demonstration to come. Meanwhile, 17 miles north of the Manhattan meeting site, Armstrong's friend C. R. Runyon was making last-minute adjustments in the world's first FM radio station—and in the process was burning out a generator halfway into Armstrong's talk. Armstrong continued the technical talk until he received word that Runyon was ready. An FM receiver—hand-made, and one of the few then in existence—was set up near the lectern in the lecture hall.

For a moment the receiver groped . . . until the new station was tuned in with a dead unearthly silence, as if the whole apparatus had been abruptly turned off. Suddenly out of the silence came Runyon's supernaturally clear voice: "This is amateur station W2AG in Yonkers, New York, operating on frequency modulation at two and a half meters." A hush fell over the large audience. Waves of two and a half meters ([approx.] 110 megacycles) were waves so short that up until then they had been regarded as too weak to carry a message across a street. Moreover, W2AG's announced transmitter power [100 watts] was barely enough to light one good-sized electric bulb. Yet these shortwaves and weak power were not only carrying a message over the seventeen miles from Yonkers, but carrying it by a method of modulation which the textbooks still held to be of no value. And doing it with a life-like clarity never heard on even the best clear-channel stations in the regular broadcast band. . . . A glass of water was poured before the microphone in Yonkers; it sounded like a glass of water being poured and not, as in the "sound effects" on ordinary radio, like a waterfall. A paper was crumpled and

turned; it sounded like paper and not like a crackling forest fire. An oriental gong was softly struck and its overtones hung shimmering in the meeting hall's arrested air. . . . The absence of background noise and the lack of distortion in FM circuits made music stand out against the velvety silence with a presence that was something new in auditory experiences. The secret lay in the achievement of a signal-to-noise ratio of 100-to-1 or better, as against 30-to-1 on the best AM stations.

Source: Lawrence Lessing, *Man of High Fidelity: Edwin Howard Armstrong*. (Philadelphia: Lippincott, 1956), pages 209–210. By permission.

Still, Sarnoff sent some top RCA scientists to Columbia to observe more demonstrations and, on their advice, invited Armstrong to install equipment in RCA space atop the Empire State Building to test FM under broadcast conditions. RCA engineers, working with Armstrong for several months in 1934, made comparative broadcasts of music and other material using both AM and FM transmissions picked up by a receiving station 70 miles away. In November they transmitted by a single multiplexed FM carrier wave both the NBC-Red and -Blue programs of that day, a facsimile copy of part of the front page of the *New York Times*, and a telegraph message—all at the same time.

The parting of the ways came in spring 1935. On April 26, Armstrong publicly announced his new radio system and made plans for demonstrations for other engineers and the press. Just ten days later, RCA announced its decision to spend \$1 million developing television (see 5.14). RCA had decided to go with television, a totally new medium already exciting the public, rather than what it considered only an improvement on an existing system. The potential profits of television were clearly more attractive. Late in 1935 Armstrong was asked to remove his FM apparatus from the Empire State Building so that room could be made for expanded RCA television experimentation.

5•12 *Early Innovation of FM*

Edwin Armstrong believed that FM was bound to replace AM so that static-free and better quality sound would prevail. With the end of RCA cooperation, he moved to promote his system by using his own substantial fortune—from the sale of earlier inventions, mostly to RCA—and by persuading influential broadcasters to back

him. In November 1935 Armstrong demonstrated FM to an engineering society meeting in New York, publishing the key parts of that paper a few months later. Despite continuing skepticism of Federal Communications Commission (FCC; see 5.8) engineers, Armstrong received permission to build his own experimental FM station at Alpine, New Jersey, on the Hudson River Palisades, within range of New York City. That fall the FCC held frequency allocation hearings (see 5.14) and provided the experimental radio service with space for 13 of Armstrong's 200 kHz channels but in three widely separated places in the spectrum. Only five channels were suitable for the existing transmitting and receiving technology. (See allocation chart in 6.81).

However, Armstrong plowed ahead. Support for FM came from the Yankee Network, a large New England AM network developed in the 1930s by John Shepard III, with ten stations in 1933 and twice as many a decade later. In spring 1937, Yankee applied for permission to build a 50 kw FM station in Paxton, Massachusetts, to experiment with long-range and relay broadcasting. Armstrong's own station, W2XMN in Alpine, became the first lasting FM station when it began low-power tests in April 1938. The first Yankee Network FM station started in 1939, followed by a second a few months later. General Electric established stations in Albany and Schenectady, New York, to test FM reception and made plans to manufacture receivers. Before the year was out, stations were on the air from Washington, D.C., New York City, several places in Connecticut, and Massachusetts. Three experimental stations, including one owned by NBC—RCA liked to hedge its bets—and two in Wisconsin, opened in early 1940, broadcasting special engineering test programs, a lot of music, and no

commercials. Several New England stations experimented with relay broadcasting, whereby one station broadcast a program and others picked it up with sensitive antennas and rebroadcast it. In this way, they could avoid AT&T line connection expense and achieve better sound quality. Without static, and with an audio-frequency response up to 15 kHz, such relaying was possible on FM but not on AM (though experimentation with wide-band high audio fidelity AM also was ongoing).

The success of these experiments led to demand for receivers, and firms started making FM sets. Several stations attempted to promote interest among listeners in the better sound of the new system, although FM table model receivers cost at least \$60. Supporters demonstrated FM reception to engineering, political, and social groups, and early in 1940 formed an FM trade association to persuade the FCC to allow commercial operation of FM stations.

More than 20 experimental FM stations were on the air, with more being built, when the FCC began eight days of hearings on FM's status in mid-March 1940. A wide variety of views was heard, and to most observers' surprise, RCA, then deep in television promotion, presented no objections to FM. The commission announced its approval of commercial FM on May 20 to begin January 1, 1941, on 40 channels provided in a new and wider band of 42–50 MHz with the lowest five channels reserved for educational stations. To accommodate FM, experimental television lost an existing channel and government services seven MHz of spectrum space, but they both gained even more space in other parts of the spectrum. Engineering rules released in June called for three classes of FM stations, defined by area served rather than power and frequency as with AM. The first construction

permits for commercial FM stations were issued to 15 applicants in October, and in December the FCC issued an FM call-letter plan, which used numbers and letters in a code signifying station geographic and frequency locations.

A number of factors held up FM's initial growth. Construction permits were frozen during the FCC investigation of newspaper control of radio stations (see 5.83). While about 40 stations were on the air by December, only half were operating commercially. Of the rest, operating with experimental licenses, few had full power. Nearly all FM stations were affiliated with an AM station in the same city or town and thus lacked impetus for a rapid push to full-fledged commercial operation. Preparations for national defense put increasing demands on construction materials. By the time the United States entered the war in December 1941, FM was a commercial service, but just barely. Fewer than four hundred thousand receivers were in the hands of the public, and few of the 50 or so stations were in the West or South.

5•13 Facsimile

The notion of sending print and still pictures by wire or wireless was not new. The newspaper industry used a process called *wirephoto*, by which a photograph was scanned and sent by wire. By the late 1930s, interest developed in the idea of sending entire newspapers by radio rather than having them hand-delivered to the home. Receivers were designed and some FM stations experimented with *fax*, but facsimile never got off the ground as a broadcast medium. There were several reasons: the greater interest in the *moving pictures* of television, competition with new FM and older but still expanding AM radio services, high costs of facsimile

paper, and inability of the system to transmit quickly. Facsimile seemed to have more applications for industry than for the home. Only in the late 1960s did industrial and public safety uses of fax systems become important, but by then there were few proponents of home systems.

5•14 *Electronic Television*

Although many early television experimenters used mechanical devices for both transmitting and receiving (see 4.12), later experimenters realized that the cathode-ray tube, which had been developed by Sir William Crookes and others in the 1870s, could better display the televised image. In 1897, Professor Karl Ferdinand Braun of the Physical Institute of Strassburg produced the cathode-ray oscilloscope, which used the tube for the visual observation of electrical signals. A decade later, Professor Boris Rosing of the St. Petersburg Technological Institute modified a Braun tube to display very faint images from a mechanical scanner that fed into a photoelectric cell connected to the Braun tube.

This development made clear the outlines of a practical home-television system. Lee de Forest's Audion (see 2.22) would amplify the weak video current; the cathode-ray tube would need further development; and methods of transmitting by wireless and synchronizing transmitting and receiving apparatus would still have to be devised—but the basic idea was there. True, a television camera had to be designed that would break the picture down into very small elements and make sharp distinctions between light and shadow. Developing present technical standards took several decades.

The two paths of development of electronic scanning, which were merged

in the late 1930s, are associated with the names of Zworykin and Farnsworth. Vladimir K. Zworykin had been a student of Rosing's just before World War I and had started extensive work on television as early as 1917 as an employee of the Russian Wireless Telegraph and Telephone Company. The principles of the system that he later developed were in his mind by 1919 when he came to the United States. Joining the Westinghouse research staff in 1920, he spent several frustrating years, including a year and a half at another company, due to lack of interest in television at Westinghouse. He eventually received approval to work on television, photoelectric cells, and sound motion picture reproduction. Although Westinghouse took out the first patent on Zworykin's camera tube in 1923, a practical demonstration of what he called the *iconoscope*—from the Greek words *eikon* (image) and *skopein* (to view)—could not be made until 1928. This device used a storage-discharge effect to achieve sensitivity to lower light levels, and magnetic deflection to aim a beam of electrons across a target that had been charged by light impinging on it. Unbeknownst to Zworykin, the British physicist A. A. Campbell Swinton had anticipated the iconoscope in 1908 independently of Rosing's need for an electronic scanner, but Campbell Swinton had never developed it. David Sarnoff, then vice president and general manager of RCA, became interested in Zworykin's invention and offered him support, which increased in 1930 when RCA took over research in radio from GE and Westinghouse.

The other major inventor of electronic television was Philo T. Farnsworth, who worked under conditions very different from Zworykin's association with RCA's large industrial laboratory. As a boy in Rigby, Idaho, Farnsworth read popular electrical and radio magazines. In 1921, at

age fifteen, he started studying photoelectricity and the cathode-ray tube. His high school notebooks later became crucially important in a major patent fight. While a student at Brigham Young University, he met San Francisco businessman George Everson, who arranged financial backing for the young inventor and later wrote a book about him. Farnsworth consistently had difficulty in working within an organization and in pressing an idea through to commercial success, although his scientific and engineering skills were exceptionally high. By 1927 he had transmitted his first picture—a 60-line image of a dollar sign! By 1930 he had developed an image dissector and a new television scanning and synchronizing system that he hoped to refine for commercial use. The Depression and increasing expenditures led him to accept financing from Philco—the Philadelphia Storage Battery Company, soon to be an important radio manufacturer—and move to Philadelphia, where he worked from 1931 to 1933. But the Philco management, which wanted to get in on the ground floor of television independently of RCA, decided that they could not wait for Farnsworth, despite his ability, to develop a commercial system of television. Continuing his work in Philadelphia with the support of his California backers, Farnsworth steadily improved his system.

By 1938 more than \$1 million dollars had been spent on Farnsworth's research, development, and legal fees—with only about 7 percent of that sum recovered from license fees and royalties. However, working with a series of excellent patent attorneys, the Farnsworth interests had 73 patents and 60 applications, approximately three-quarters of which represented the inventor's work on the image dissector, the image amplifier, and other devices. The strength of Farnsworth's pat-

ent position was proven by his winning in a number of important patent interference proceedings. In two of these, the Patent Office, concluding that the image dissector operated on different principles from the iconoscope, gave basic patents to both Farnsworth and Zworykin. In 1941 Farnsworth won a patent interference case against RCA that secured basic patents on synchronization and other important aspects of his television system. As a result, both RCA and AT&T decided to take out television licenses as early as 1939. For the first time RCA had to pay royalties to another concern; RCA patent manager Otto Schairer reportedly signing the royalty agreement with "tears in his eyes." The Farnsworth company went into manufacturing, but in 1940 Farnsworth—partly because of ill health, which plagued him until his death in 1971—resigned as research director.

Even more than Edwin Armstrong, Farnsworth typified the lone inventor in technological development. Uncomfortable when he had to work with the public or within a large group, he was obviously happier working in a small laboratory than as vice president of a manufacturing company. Television is an especially complex field, and the lone inventor or innovator is at a disadvantage compared to the research team whose work receives continuity and support from large corporation, government, or university funds.

Picture definition had been very limited at first, but both Farnsworth and Zworykin soon produced more detailed pictures with their delicate and expensive electronic gear than mechanical systems could produce (see 4.13). As early as 1927 Farnsworth demonstrated an electronic system with a resolution around 100 lines at 30 pictures per second, compared with the 30- to 60-line definition of the best

mechanical systems of that time. RCA transmitted 120-line pictures electronically in 1931 and 343-line pictures four years later. Although mechanical systems eventually exceeded 200 lines, they had clearly approached the limits of their technology, while electronic television was capable of much improvement.

Continuing experimentation led to an increasing demand for spectrum space. Stations at Purdue University in Indiana and GE in Schenectady, New York, were sending recognizable images thousands of miles on the shortwave 2 MHz band, but the experimenters needed more and much wider channels and hoped for commercial operation on higher bands. Under pressure from conflicting FM and television in-

terests, the FCC held a series of allocations hearings and decided in 1937 (1) to accept applications for experimental television stations in the band from 20 to 300 MHz, already rapidly filling with other services, and (2) to allocate seven channels, each 6 MHz wide, in the band between 54 and 108 MHz, with an additional 12 channels in the 156–294 MHz band set aside for experimentation and expansion. Only the lower seven channels were put to use, however, as receivers of the period could not pick up the higher band transmissions, and transmitting devices at these frequencies were then not very efficient.

By the end of the 1936–1937 Informal Engineering Conference, the FCC concluded that “television is not yet ready



The Rise of Electronic Television: 1930s / An experimental model television receiver (with a mirror to reflect the picture tube, which faces straight up) is tried out by RCA's Vladimir Zworykin—inventor of the iconoscope tube and one of the key figures in the development of electronic television. Courtesy of Group W and Broadcast Pioneers Library.

The First Television Sets Go on Sale: 1938-1939 / Television sets were probably first offered for public sale in the United States in April 1938 (England had beaten us by nearly two years) at Piser's Furniture Store in the Bronx, New York. About four thousand customers jammed the store for the first showing of a 3-inch (\$125) and a 5-inch (\$250) set offered by Communications System, Inc. The first table below shows what was available by Christmas 1938. Macy's department store had four different brands on sale in May 1939, and by July, as seen in the second table, 14 manufacturers were in production or planning for same. By December 1939, 8 set-makers had produced 5,000 television receivers—all before final FCC approval of standards. Prices ranged from \$200 for 5-inch screens up to \$600 for 9-inch sets. Most of these sets were used as demonstrators and very few were sold. *Note:* The dollar in those days was worth more than four times what it is today.

TV Sets Available in December 1938

Company	Size of Screen (in inches)	Price Range (in dollars)
American Television Corp.	3, 5	\$125-395
Andrea Radio Corp.	na	175-595
Dumont	14	395-445
General Electric	5, 9, 12	175-600
RCA	5, 9, 12	175-600

TV Sets Available in July 1939

Company	No. of Models	Size of Tube (in inches)	Retail Price (in dollars)
American Television Corp.	3	5	\$185-395
Andrea Radio Corp.	2	5-12	190-350
Crosley	2-4	Announced for August	
Dumont	2	5	190-600
Farnsworth	2-4	Announced for the Fall	
General Electric	5	5-12	195-1,000
International Television	1-3	Announced for December	
Majestic	1	5	na
Majestic (kit)	1	5	125
Philco	6	5-9	200-425
Pilot	3	9-12	250-425
RCA	4	5-12	150-600
Stewart-Warner	1	9	600
Stromberg-Carlson	1	9	575
Westinghouse	3	5-12	200-600
Zenith	None for sale, but some for loan		

na = not available

Source: Alfred R. Oxenfeldt, *Marketing Practices in the TV Set Industry* (New York: Columbia University Press, 1964), pages 9-11. By permission.

for public service on a national scale," but that "the rate of [television] progress is rapid and the energies of the laboratories of the country are being concentrated on the technical development of television." Still, the FCC warned the public, "There does not appear to be any immediate outlook for the recognition of television service on a commercial basis," and it prohibited sponsorship of programs. It also required that licensees must conduct research and report on the result of that research to the FCC.

In 1938 RCA proceeded toward standardizing television for commercial use. It had spent millions of dollars on research and acquired competing and secondary patents. After negotiating an agreement on patents with Farnsworth in 1939 largely on Farnsworth's terms, it was ready to innovate television on its own standards and terms. Despite the displeasure of other experimenters and manufacturers, RCA persuaded the Radio Manufacturers Association (RMA) to consider adopting new television standards. When an RMA committee found that the only other practical system, Farnsworth's, was being merged with RCA's in a patents pool, the RMA adopted the RCA system. Before RCA could begin regular programming and sell receivers to the public, the FCC had to accept the proposed standards and then approve commercial operation. Several months after the RMA presented the proposed new standards on September 10, 1938, the FCC appointed a committee of three commissioners to investigate the status of television preparatory to recommending a course of action. The RMA request had aroused considerable public interest about television's future. Newspaper columnist Walter Winchell predicted on September 18 that "the local stores will be selling television sets for as

little as \$3.95 by October 1." Things did not move quite that fast.

5•15 *Television's False Dawn*

The FCC television advisory committee moved cautiously. Its initial report of May 22, 1939, recommended that further delay in setting standards would best serve the public interest and straddled the fence by condemning premature standards while praising the proposed RMA-RCA standards as adequate.

Throughout this period, the FCC was preoccupied with the anticipated public investment in receivers. Even in its order of March 23, 1940, granting RCA limited commercial television, the FCC pointed out that "public participation in television experimentation at this time is desirable only if the public understands that it is experimenting in reception and not necessarily investing in receiving equipment with a guarantee of its continued usefulness." Despite this, RCA emphasized the sale of receivers to the public in its publicity for a broadcast on April 30, 1939, from the New York World's Fair.

In its second report, on November 15, 1939, the television advisory committee reversed itself and proposed standards of 441 lines, 30 pictures per second, which were, of course, supported by their author, RCA. Relying heavily on "the thoughts of the present leaders of the industry"—rather than upon such nonmanufacturing outsiders as Armstrong and CBS—the committee concluded that more rapid progress could be expected by "allowing commercial operation to recoup some developmental expense."

Opposition to the RCA proposals crystallized at FCC hearings starting January 15, 1940. Many sources—including

Dumont, Zenith, which particularly disliked the weak synchronization technique, and Edwin Armstrong, who wanted additional frequencies for FM radio (see 5.22)—objected to certain technical standards and allocations. Some called for higher definition through a variety of ingenious means. In fact, virtually the entire manufacturing industry objected to being “frozen out” by the adoption of RCA’s standards. RCA had the support of only its engineers and Farnsworth.

In the face of this controversy, the FCC reached a typical compromise: some television stations would be permitted “limited” commercial operation—to give program developers a chance to recoup some costs—starting September 1, 1940. At the same time, no standards of transmission would be fixed, since “crystallization of standards at the current level of the art, by whatever means accomplished, would inevitably stifle research in basic phases of the art in which improvement appeared promising.” This decision meant that, despite the dangers of equipment obsolescence, the public was to have the “opportunity” to buy various types of receivers to determine which system it preferred.

Notwithstanding the commission’s admonition against encouraging “a large public investment in receivers which may become obsolete in a relatively short time,” RCA took the approval for “limited commercial broadcasting” as a green light to manufacture and sell television receivers. It launched an intensive promotion and advertising campaign on March 20, 1940, that said, in essence, television is here, the commission has approved it, and a new commercial service to the American home will start—in the New York area, at least—on September 1, 1940. This publicity campaign was preceded by a bitter fight

within the RMA when RCA’s chief television engineer presented the company’s position to an RMA committee as if it were a *fait accompli*, and when president David Sarnoff threatened to pull RCA out of the RMA, refusing to discuss “any program the purpose of which is to delay the commercialization of television”—a far cry from its January FCC testimony. Philco withdrew from the RMA television standards committee, saying that the committee could serve no further purpose, since widespread sale of RCA equipment would make consideration of any other standard futile. All other members of the committee except RCA and Farnsworth voted to consider new proposals, but none was forthcoming.

However, the FCC reacted strongly to RCA’s strategy. It issued a vigorous order only two days after the RCA publicity campaign started, and Chairman James Lawrence Fly delivered his opinion of RCA, and a description of the issues, in a nationwide broadcast on April 2. The FCC order called for a new series of hearings, to start April 8, reopening the question of standards and starting date for commercial broadcasting. The hearings lasted five days, with the same cast of characters. President Roosevelt announced on April 12 that the administration would exert every effort to prevent television from coming under monopolistic control. The FCC stated that it would have acted sooner if it had known about the RCA statement and hostilities at the RMA February meetings. (Ten years later General Sarnoff claimed that he had “personally” shown FCC Chairman Fly the objectionable RCA advertisement *before* it was published.)

Put on the defensive at the hearings, RCA stimulated a Senate investigation of the FCC’s television policy in mid-April. This tactic failed to soften Chairman Fly’s determination, and the

The First Television Rate Card: 1941 / Here is a partial reproduction of the first of a long series of television rate cards for NBC's New York outlet (now WNBC-TV), dated for the beginning of U.S. commercial television. Compare these rates with those reported in the "Key Indicators" tables for later chapters.

NBC Television Rates Station WNBC

EFFECTIVE JULY 1, 1941

TRANSMISSION
RATE

GROSS

6:00 PM to 11:00 PM Daily
 8:00 AM to 12 Noon Daily
 12 Noon to 6:00 PM Daily, exclusive
 of Saturday and Sunday
 12 Noon to 6:00 PM
 Saturday and Sunday
 11:00 PM to Sign Off Daily

60 Min.	30 Min.	15 Min.
\$120.00	\$60.00	\$30.00
60.00	30.00	15.00
60.00	30.00	15.00
90.00	45.00	22.50
90.00	45.00	22.50

Rates for other units of time in exact proportion to corresponding one-hour rate. No periods less than 5 minutes sold except for Service Spots.

SERVICE SPOTS (News, Weather, Time, Etc.)

Evening (6:00 PM to Sign Off)—\$8.00 for maximum of 1 minute.
 Day (8:00 AM to 6:00 PM) —\$4.00 for maximum of 1 minute.

PROGRAM
FACILITIES
RATE

TYPE OF FACILITIES (Based on time on the air to nearest 5 minutes.)

	60 Min.	30 Min.	15 Min.	10 Min.	5 Min.
Main Studio	\$150.00	\$90.00	\$60.00	\$53.00	\$45.00
Small Studio	75.00	45.00	30.00	26.00	22.00
Film Studio	75.00	45.00	30.00	26.00	22.00
Field Pickups	75.00	(Minimum Charge—\$75.00)			

Rates for units of time longer than one hour in exact proportion to corresponding one-hour rate.

Service Spots—Facilities and Handling—\$5.00 per spot.
 (Must originate in small or film studio.)

FCC issued a scathing report on May 28 which condemned RCA, reviewed past developments, fostered research and development by other companies, limited station owning, and rescinded permission for commercial broadcasting until the entire industry could agree upon standards. A brief fight centered on the right of the FCC to regulate the manufacture and sale of, and public "right" to buy, television receivers; but Fly was able to give as good as he got, and RCA clearly lost this fray.

Political and legal arguments did not stop engineering developments. In July the RMA established a National Television System Committee (NTSC), chaired by W. R. G. Baker of GE. By January 27, 1941, after 5,000 man-hours of work, the industry was able to present a united front to the commission, which the next day called for a public hearing. At these hearings, starting March 20, 1941, the FCC found that the NTSC standards had virtually unanimous industry approval, and that the 525-line, 30-picture standards were far superior to those of 1940. In addition, the new standards substituted FM for AM sound in television and greatly strengthened the synchronization system. In its report of May 3, 1941, the FCC accepted the NTSC recommendations and approved commercial television operation using the new standards starting July 1, 1941. These basic standards are still in use today.

The FCC's decisions did give television a green light, although they took away one of its 19 channels, deferred action on CBS's suggestion that color television be considered, created a very minor problem of receiver obsolescence—affecting only a few thousand sets, which the manufacturer could convert—and, in general, reflected the salutary effects of knocking together the heads of engineers and manufacturers to achieve cooperation.

5•2 Station Expansion

As the country slowly emerged from the Depression, radio broadcasting began to expand again. In the 1935–1941 period, more than 200 new AM stations took to the air, while few went off (see Appendix C, table 1). By the late 1930s, cumulative investment in tangible broadcast property, in addition to receivers, was in the order of \$65 million. Many communities got their first radio station, while most large cities added one or more stations. This expansion, however, was not uniform throughout the country. In 1936, 43 percent of *all* stations were in markets of 100,000 people or more, as were 60 percent of the regional and 90 percent of the clear-channel operations. Smaller communities usually had to make do with low-power (100–250 watts) local stations, 75 percent of which were located in such communities; most places under 10,000 population, and many under 50,000, had *no* local station. Thus radio was still a large-town or city service, and many listeners in rural areas had only secondary service (see 5.7).

The major reasons for urban bias in coverage were economic and technical. In a country still in a depression with restricted advertising budgets, placing a station in a market too small to support it adequately was economically foolish. Many cities without radio stations were served by numerous outlets in nearby metropolitan areas. Advertisers and their agencies, to avoid splitting up one audience with many stations, usually favored the larger operations.

The technical problems were more involved. For one thing, radio station power continued to increase. Whereas only 37 stations broadcast with from 5 to 10 kw in 1935, 140 stations broadcast with such power in 1940. Stations with 50 kw

of power had increased from 29 to 39, but low-power (100 watts or less) stations had dropped from 179 to 98. Since new stations of the Depression years typically were established in areas with limited radio service, they created few interference problems. But the Davis Amendment (see 4.82) allowed the Federal Radio—and Federal Communications—Commission little flexibility in approving construction permit applications, as equality of facilities in the five zones had to be maintained. On June 5, 1936, the Davis Amendment was repealed, allowing more radio growth in highly populated areas by removing this artificial lid on radio expansion. A rush of applications followed for areas with the most population, again shortchanging rural areas and suburbs. The clear-channel stations in large cities were expected to provide service to thousands of square miles of rural areas at night, when sky-wave propagation makes radio waves travel longer distances.

5•21 *Minimizing Interference*

A number of ways to reduce interference were proposed. One, first tried by the FRC, was to reduce nighttime power and number of stations on the air. By the late 1930s, about 10 percent of the stations were licensed to operate during daytime hours only and another 30 percent reduced power at night. A small proportion—4 percent in 1937—could broadcast only during specific, usually daytime, hours, and another 18 percent shared operations on the same frequency with another station in the same community. Another, more important means of limiting interference was the *directional antenna* (DA), which sent a station's signal out more strongly in one direction than another,

protecting other stations in the suppressed directions from much man-made interference. This engineering technique was used by only 12 stations in 1934 but by more than 200—roughly one-quarter of all stations—by 1941. When adjacent or co-channel stations in different communities used it, they normally could stay on the air with ordinary power serving their audiences, without overlapping. Sometimes the directional pattern—often a figure 8 or more complicated shape—required two to four expensive towers and great engineering skill.

However, something more was needed. Late in 1939 the Federal Communications Commission modified the 1928 FRC broadcast station classification system to allow four types of stations: Class I, high-power stations operating on the 25 clear channels; Class II, secondary stations operating on clear channels (but using less power at night, using DAs or, most often, going off the air at night to protect a dominant clear station); Class III, regional stations; and Class IV, low-power local operations on the few channels set aside for them. The major change was the establishment of Class II.

There was, and is, a continuing debate on the role of clear-channel stations, those 50 kw operations in major cities. Some observers consider them to be the first at the spigot, skimming off the best advertising dollars. Others, including rural spokesmen and their many defenders in government, see them as the only effective means of reaching most of the country at night. More than one-third of the nation's voters got their only reliable night radio service in the 1930s from clear-channel stations. The conflict between this kind of coverage and the equally important need for more stations on the air, especially local stations in areas with no primary service, led to major debates in the late 1930s.

5•22 *Superpower*

The licensees of clear-channel stations fueled the debate by forming a pressure group that pushed the commission for more power. *Superpower* was not a new term, but whereas it once had meant 1,000 or 5,000 or even 20,000 watts, 50,000 watts was now the limit for AM stations. Clear-channel operators said that yet greater power would allow better service to a wider coverage area, which usually meant more nighttime coverage for the rural areas. Opponents of superpower saw this demand as another ploy to get more power and economic clout for stations already too powerful.

Superpower was put to the test in Cincinnati. In 1934 Powel Crosley, Jr.'s clear-channel station WLW was allowed to broadcast with 500,000 watts from 1 A.M. to 6 A.M. as an experiment. On April 17, 1934, Crosley secured a short-term license for 500,000 watts around the clock to experiment with audience and advertiser reaction to the increase, as well as to measure day and night interference. The power increase somewhat extended the station's already wide coverage, but its main effect was to improve the signal substantially in areas already reached. It also caused immediate interference to CFRB in Toronto, and the Canadians complained. To protect CFRB, the FCC required WLW to install a directional antenna in February 1935, and the experiment continued. Listener surveys showed WLW as "first" in preference polls in 13 states, and "second" in six additional states—all of the Midwest and a chunk of the South and East. WLW acquired a national focus, dubbed itself the "Nation's Station," and soon subsisted completely on national and regional advertising. Local advertising disappeared partly because the station raised its rates by 20 percent—WLW explaining to the

commission that additional use of electricity and some expensive rewiring had helped push operating costs up 68 percent (\$25 more per operating hour). With the rate card increase, WLW's income was soon three times that of other 50 kw stations, although additional operating costs kept its net profit about the same. But more important, WLW did not want to relinquish the national prestige that the higher power rating had brought.

Others, however, distrusted one station's having such a wide audience. United States senators expressed concern that regional and local stations might find it harder to serve local interests. Fifteen other 50 kw clear-channel stations filed applications with the FCC to operate with the higher power. Networks fretted that wide-coverage competition might affect their business, and smaller regional and local stations in WLW's coverage area complained about the station's domination. A 1938 "Sense of the Senate" resolution (not a law, but a consensus of the Senate's thinking) stated that 50 kw was plenty for any AM station within the American broadcasting structure—a limit still in effect. In March 1939 the FCC rescinded the 500 kw fulltime authorization for WLW, allowing only early morning experimentation once again. The station appealed, but the decision stuck. An attempt by some broadcasters to obtain 500 kw operation in 1940 because of the defense buildup also failed. WLW's early morning experiments continued until early 1942, when wartime restrictions ended them. The 500 kw transmitter eventually was broken up into smaller units and used for shortwave broadcasting.

In some ways, this superpower debate and experiment can be seen as the high-water mark of AM broadcasting facilities. Wartime problems soon hobbled AM radio expansion; and, after the war,

although there were many new stations, attention was diverted to FM and television development. Most clear channels were nibbled away over the next decades (see 9.21).

By 1941 radio broadcasting was a fulltime business, and most station owners were fulltime broadcasters. The commission increased the stability of the industry in 1939 when it extended the license period from six months—which it had been since 1928—to one year, although the Communications Act permitted and the FCC later adopted a three-year period. Of all stations on the air in 1939, networks owned 4 percent and newspapers 28 percent. Such figures conceal the true concentration of power, however. With respect to clear-channel and high-power regional stations, networks owned 25 percent, newspapers 27 percent, and radio/electrical manufacturers about 13 percent—roughly two-thirds of the total. Broadcasting was to a great extent individually and locally owned, but the big-audience and big-profit stations were concentrated in fewer hands.

Another sign of growth amid relatively stable conditions was the near doubling of broadcast employees—stations and networks, full- and part-time—from 14,000 in 1935 to 27,000 in 1941. The National Association of Broadcasters estimated in 1940 that approximately 350,000 persons were employed because of radio in advertising agencies, radio manufacturing companies, and as talent as well as in stations and networks.

5.3 Network Domination

With a few exceptions, success in radio station operation in the 1930s required having a network affiliation—preferably NBC-Red or CBS. By late 1938 the four national networks (see below) had

affiliated all the 52 clear-channel stations but two—and they had ties with Mutual, half the regional stations, and even some low-power local stations. In all, almost half the unlimited-time stations were network affiliates. These stations took in the lion's share of broadcast revenues, because the big audiences that popular network programs drew attracted local advertisers.

By 1941 there were four national networks—NBC-Red, NBC-Blue, CBS, and Mutual—and some 20 regional networks. Of the latter, 14 operated in only one state, while six had wider coverage, including the Don Lee Network on the West Coast and the Yankee Network in New England. Many regional networks offered special programming to their affiliates, others merely facilitated program exchange, but all networks made time-buying easier for the advertising agencies by offering a block of stations and wide coverage with one order.

NBC was, and is, totally controlled by RCA, a publicly held corporation. In 1941, after the divestitures caused by governmental antitrust action a decade earlier, no one individual or firm held more than one-half of 1 percent of its stock. During the 1930s NBC operated two separate networks: the more important Red Network with larger stations as affiliates, and far more advertising income and popular programs than the Blue Network with its less powerful stations and more public service and sustaining programming. In 1935, 14 percent of the country's stations were affiliated with one or the other of the NBC networks, a figure that went up to 25 percent by 1941, not including 100 stations listed as optional—at the sponsor's request—affiliates for either network. NBC owned ten stations and, from 1932 to 1940, was responsible for operating five others owned by Westinghouse—an agreement that ended when the FCC required licen-

sees to program their own stations. Of the ten owned-and-operated (O & O) outlets, all but three were unlimited-time 50 kw stations. As broadcasting became more complicated in the 1930s, so did NBC. In 1930 it opened a short-lived talent agency. In 1934 it began a transcription service, first for its affiliates and then for other stations, which provided a regularly supplemented and renewed library of prerecorded music on large discs.

In the late 1930s CBS was about one-third owned and controlled by its president, William S. Paley, and his family. It affiliated with some 15–16 percent of all the stations on the air and from 1936 to 1939 owned nine stations outright. In 1939 CBS sold its Cincinnati outlet and, unlike NBC, settled for a large minority interest in two other stations. All but one of its O & Os were unlimited-time 50 kw operations. Like NBC, CBS operated an “artist’s bureau”—a talent agency, which actually did more business with NBC than with CBS—and, starting in 1940, a transcription service. That CBS was not in the phonograph record business until the end of 1938, when it bought the American Record Corporation—which then had Columbia Phonograph Company as a subsidiary—and changed its name to Columbia Record Corp., can partly explain the six-year lag behind NBC. CBS was devoted to broadcasting and other program-related services, while NBC was only a small part of a large electrical manufacturing and communications firm.

In summer 1934, four major eastern and midwestern stations decided to make themselves available to advertisers at a group rate by interconnecting themselves by wire lines. The four stations were WGN (Chicago), owned by the *Chicago Tribune*; WOR (Newark, New Jersey), owned by the Bamberger department store; WLW (Cincinnati), owned by Powel Cros-

ley, Jr., and just starting its 500 kw experiments; and WXYZ (Detroit), owned by George W. Trendle. The first three were 50 kw clear-channel stations trying to improve their economic condition outside the established networks, while WXYZ brought an especially popular new program, *The Lone Ranger*, to the new network. On September 29, 1934, the group changed its name from the provisional Quality Network to the Mutual Broadcasting System, a name that stressed its unique organizational structure.

Unlike CBS and NBC, Mutual did not have a central ownership with O & O stations and contractual affiliates. From the beginning it was a cooperative venture, more or less equally operated by its four partners, although only WGN and WOR technically owned the firm’s nominal amount of stock. For two years Mutual remained limited to its original four stations but was heard in most of the eastern United States. When WXYZ left Mutual for NBC in late 1935, its place was taken by CKLW in Windsor, Ontario, which served the same region. In 1936 the 13 affiliates of the New England-based Colonial Network and the 10 affiliates of the West Coast-based Don Lee Network affiliated as well with Mutual, making it a true national network. The addition of other independent stations and networks, including a 23-affiliate Texas network, brought Mutual from less than half of 1 percent of all stations in 1935 to more than 19 percent by 1940, and brought the first network service to many communities. However, many of its new stations were primarily affiliated with NBC or CBS and used Mutual programs only as fillers; most of Mutual’s affiliates were regional and local outlets with low power and relatively small audiences. Not surprisingly, therefore, this network lagged behind NBC and CBS in audience size and in advertising income. Because Mutual was

a cooperative venture, most programs came from the founding or affiliate stations, although it did operate a small central news service in New York.

Perhaps the clearest indication of the importance of networks in the late 1930s—and the reason for the FCC investigation discussed in 5.83—was the increasing control that CBS and NBC exerted over their affiliates. Stations were bound to these networks for five-year periods, although the networks could end a contract after any single year. Mutual's one-year term for both sides was an exception. Affiliations were tightly exclusive: networks would provide programs only to their affiliates, and affiliates could provide time to other national chains only on occasions when their primary network did not care. Contracts assigned option periods each day to the network for its national commercial programming. CBS had the right to take all day, NBC most of the day, but it gave 28-day notice, and Mutual averaged four hours a day. Finally, stations legally could reject sustaining programs from the networks in order to air local shows, but rejecting commercially sponsored programs could jeopardize their affiliation.

The one-sided nature of network contracts was a result of relative strength. Local stations gave networks and national advertisers access to audiences in their communities. But networks had the advertising money to produce programs that stations needed to attract audiences. No single station could afford to put together programs that would be as popular as those of the networks. Networks also supplied sustaining programs that the stations could use as free "fill." Hence, the affiliated stations, even with regional coverage, needed the networks more than vice versa, and other stations always were waiting for a chance to affiliate. Networks could de-

mand and get major concessions, although powerful clear-channel stations could sometimes get better terms than smaller stations. In Mutual's cooperative arrangements, contracts tended at first to treat the two parties as equals. But when the proposed Transcontinental Network, which never materialized, threatened Mutual in 1938, MBS tightened its contracts in order to hold onto its affiliates. Clearly broadcasting in the 1930s was centrally controlled by the networks, and this concentration of programming authority brought government attention (see 5.83).

5.4 Educational Radio: Talk but Little Progress

The 38 AM educational stations on the air in 1936 had dropped to 35 by mid-1941 and today number no more than 25. About half the survivors in 1941 had been on the air more than 15 years, 12 were commercially supported, and 7 of these were affiliated with a network as well, airing educational programs only a few hours a day. One was operated by a high school, 2 were operated by church-affiliated educational groups, 9 by agriculture schools or state agricultural departments, and 11 by land-grant universities, mainly in the Midwest. Only 11 stations were licensed for unlimited broadcast time, about half of them in the 250–5,000 watt category.

Educational radio consisted of a few hardy survivors of the 200 educational stations that had started in the 1920s. Although they provided solid in-school instructional and at-home educational and cultural programs to supplement educational offerings of the networks and a few independent commercial stations, their dwindling numbers made educational radio a shadow of what its adherents wanted.

Seemingly, more organizations were

interested in educational radio than there were stations on the air during the late 1930s. Two of them (see 4.4), the National Advisory Council on Radio in Education and the National Committee on Education by Radio, continued their separate approaches to the problem. The council sponsored a series of useful publications and continued to push for cooperation with commercial broadcasters—although one of its experiments, using many commercial stations, was constantly rescheduled at less and less valuable air times. The committee worked for allocation of educational channels (see 4.4) and sponsored annual conferences from 1931 until 1938, when its Rockefeller Foundation support ended. One of the committee's more lasting influences was to help local groups establish listening councils: groups of critical listeners who worked with local broadcasters to improve existing programs and plan new ones.

The Institute for Education by Radio was established at Ohio State University in 1930 and ran an annual conference on educational radio until 1960. The Federal Radio Education Committee, officially sponsored by the Federal Communications Commission, had 39 members under the chairmanship of the U.S. Commissioner of Education and existed to eliminate conflicts and promote cooperation between commercial and educational licensees. Like the other groups, it sponsored conferences and studies and promoted educational radio but did little of substance to expand the service.

The National Association of Educational Broadcasters (NAEB), developed in 1934 from the Association of College and University Broadcasting Stations, which had been established in 1925 amid the rush to get education on the air. The NAEB, the only one of the educational radio groups to survive into the 1970s, op-

erated throughout the 1934–1941 period with about 25 member stations and little money. Acting primarily as a program idea exchange, it also sponsored off-the-air rebroadcast experiments.

The notion of reserving spectrum space for the exclusive use of education was developed during the 1930s. The National Committee on Education by Radio deserved much of the credit for lobbying through this proposal. Educators had lost interest when they realized that stations assigned to the part of the spectrum originally sought (1,500–1,600 kHz, just above the standard broadcast band of that time) typically would have less range than other stations, that they would have equipment expenses, and that few receivers could receive signals on those frequencies. When the Senate was considering the 1934 Communications Act, Senators Wagner and Hatfield sponsored an amendment allocating 25 percent of broadcast facilities (essentially, spectrum space) to nonprofit organizations. However, dissension among educators and solid commercial broadcaster opposition led to the proposal's defeat. In response to a congressional order for investigation contained in the Communications Act, the commission recommended in 1935 against reservation of special frequencies and for educator cooperation with commercial stations and networks. Hearings brought forth testimony that networks and big stations were much more cooperative with educators than were small and independent stations.

Early in 1938, however, the FCC reversed itself and provided the first specific spectrum reservations for noncommercial broadcast use, selecting channels in the 41–42 MHz band, far above the standard broadcasting band. On January 26, it set aside 25 channels in this band for in-school broadcasting. The first station licensed was the Cleveland Board of Edu-

cation's WBOE, in November 1938. In 1939 the educational broadcasting allocation was shifted to 42–43 MHz, and stations were required to change from AM to the newer FM mode. Since FM required a wider bandwidth, this allocation provide only five channels, on which seven stations were transmitting to radio-equipped classrooms by late 1941. When commercial FM went into operation, the educational allocation was for channels at the bottom of the band, which were fractionally easier for listeners to receive than higher ones.

Although the potential for educational radio was considered good, financial realities restricted most FM broadcasts to in-school use. The 35 or so surviving educational stations on the standard AM band supplied a little adult education programming in evening hours. Most important, the precedent of setting aside channels for education had been established.

5-5 The Advertising Agencies Take Over

Just as the radio business reflected the Depression (see the drop in overall advertising income for 1933 shown in Appendix C, table 4) so it reflected the country's recovery in the second half of the decade. Total revenues of \$112 million in 1935 grew to more than twice that figure just six years later. In the same period, radio increased its portion of the advertising dollar from 7 percent to 11 percent—not a bad showing for a medium supported by advertising for little more than a decade. Much of this growth, of course, was due to the peculiar economic relationship between broadcasting and its audience. Once a person owned a radio receiver, he or she paid nothing for professional entertainment of high quality, but the advertiser paid dearly for the privilege of entertain-

ing potential customers among the listeners. Every year set owners had more time for radio because of household labor-saving devices, shorter work weeks, and Depression-caused unemployment.

Another factor in radio's success was the growing role of middlemen. The station time broker, active in radio's early advertising years, was replaced in the late 1930s by the station representative (see 4.51) who promoted to advertising agencies a single station in a given market, thus avoiding the time broker's conflict of interest in dealing with several stations in one market. The station rep received 10–15 percent of the station's advertising rate, after deducting the advertising agency commission of 15 percent. Rep firms grew from 28 in 1935 to about 40 five years later. The reps began to have a standardizing effect on their client stations, often suggesting which programming or advertising policies would appeal most to potential sponsors.

Representing the advertisers in all but the smallest markets were the advertising agencies, which as early as 1935 were placing three-quarters of the radio advertising orders. While many smaller agencies around the country were content to purchase time on existing programs through station reps in New York, in a few other big markets, and with the networks, large agencies worked closely with their clients and the radio networks, or big stations, to develop compatible program and advertising packages. The agency created not only the ads but also the programs, contracted for talent and studio facilities—often from the networks—to produce programs, and then presented the finished program, with integrated commercials, to the network. In effect, the agencies bought time in large chunks from the networks and a few of the largest independent stations. Stations got the popular show, networks provided the

facilities and collected the money—and Madison Avenue had all but total control over network prime-time and daytime programming.

Another example of the trend toward centralized program control was the musical program package recorded by transcription companies and sold to individual local stations in ready-to-air form, including advertising. Stations that had created their own programs in the 1920s now recognized the economy of centralized programming and the availability of the limited amount of popular talent through networks with which they were affiliated. In turn, the networks were glad to hand over their programming worries to the advertising agencies, which welcomed the opportunity to tie together program and commercial. Since the networks economically served the agencies, they felt free to let the agencies do the work and take the rap from the sponsors if anything went wrong.

Agency control of network programming continued until the advent of television in the late 1940s and early 1950s, with its enormous programming costs, discouraged agencies from making programming investments. At this stage, the television networks took over programming and, later, high prices virtually eliminated single sponsorship of programs with integrated commercials. In the 1970s, ironically, agitation grew for divorcing the networks from program production—a few people even suggesting that the agencies again take over that function.

By the mid-1930s, radio's advertising pattern for the next 15 years, and television's thereafter, was clearly established. Sixty percent of time sale revenues went to the networks and their handful of O & O stations, leaving 700 other radio stations to share the remaining 40 percent. Since most network O & Os were 50,000

watt clear-channel stations in the country's biggest markets, they naturally attracted advertising. National and regional advertisers turned first to the networks and spent relatively little on local station sponsorship or spot advertising (see Appendix C, table 4). Most small and medium-size stations had to rely on local advertising revenues.

The networks differed greatly. NBC-Red and CBS had the most popular programs, the highest charges for time, and the largest incomes. NBC-Blue was a distant third. Although it had about as many affiliates as NBC-Red, its usually lower-powered stations could not get the same advertiser support as the Red network's clear-channel and powerful regional affiliates. Also, the Blue network presented many sustaining programs—not just because they could not attract sponsors but also to counterbalance, in a public relations sense, the culturally lower but popular sponsored shows on the Red network. The fourth national network, Mutual, had little national advertising impact, since most of its stations arranged their own time sales outside Mutual's limited program exchanges. Some regional networks made a profit but were handling only a fraction as much business as any one of the national networks.

By the mid-1930s, the advertising agencies could recommend two time periods during the day as most desirable for their clients. Many food and soap manufacturing companies purchased daily time on agency-packaged serial *soap opera* programs in the late morning and early afternoon. These programs (see 5.62), named after their typical sponsors, dominated daytime scheduling and acquired large and loyal housewife audiences. The other key time, *prime time*, generally was 7 P.M. to 11 P.M. on the East and West coasts and 6 P.M. to 10 P.M. in the Central and Mountain time

zones. Prime time cost the most because it had the most listeners, and was thus the most desirable.

Agencies and sponsors considered the best combination a high-power station operating on a channel toward the low-numbered end of the broadcast band in a large and prosperous market, and attracting a large audience, typically as a network affiliate. For example, in the late 1930s more than half of the revenue went to stations in markets of more than 400,000 population, and one-quarter of the revenue went to the 50 or so 50 kw stations. In 1938 the average station in a market of over a million population had a net income of \$60,000 before taxes, while a station in a market of fewer than a half-million population might earn \$20,000. In the same year, according to FCC data, about one-third of all radio stations lost money.

A station's expenditures, like its revenues, varied with market size and station type. Powerful stations in large markets would spend about 19 percent of the average expense dollar on technical items, 43 percent on programming, and 38 percent for sales and administration. A small station in a small market would spend about the same proportion on technical items, about half as much on programming, and maybe twice as much on sales and administration. With less revenue and fewer national advertisers, local stations often offered simpler programming; recorded music cost much less than live orchestras and other talent.

A 1938 FCC survey of 633 stations showed that fully two-thirds of their programs carried advertising, compared to one-third at the start of the decade. About three-quarters of the musical programs were sponsored, about two-thirds of drama, talks and dialogues, and news were sponsored, and half of the variety pro-

grams were sponsored and half sustaining. Most other programs, like religion and special events, were sustaining.

While the radio industry's income varied with the country's economic condition, radio advertising was clearly accepted. Of the many trade publications and books on radio advertising in the late 1930s, nearly all were optimistic about radio's value.

5•6 The Golden Age of Programming

In the last half of the 1930s, most full time radio stations broadcast at least 12 hours a day, and many for 18 hours or more. Generally stations filled the expanded air time with variations of program types already developed. Three departures from this pattern were news and commentary, the daytime serial drama, and quiz and audience-participation programs.

The FCC's March 1938 survey of programming showed that 53 percent was devoted to music, 11 percent to talks and dialogues, 9 percent to drama, 9 percent to variety, 9 percent to news (which would not have been measurable a few years earlier), 5 percent to religion and devotion, 2 percent to special events, and 2 percent to miscellaneous. While network affiliates got from 50 percent to 70 percent of programming from their network, they also increased the time devoted to local and live programming. Of all radio programming in the survey period, 64 percent was live—roughly half network and half local—while 21 percent was from electrical transcriptions and 12 percent was from phonograph records—a definite increase in nonlive programming on the typical station. (See box on the opposite page for a schedule of one major station in 1937.)

A Radio Station's Programs: 1937 / This is a typical weekday schedule for WTMJ, the *Milwaukee Journal* AM station, as taken from a telephone audience report. The listing does not show programs on the air before 8 A.M. or after 10 P.M. as calls were not made earlier or later than that. Actually, WTMJ went on the air around 6 A.M. and did not go off until about midnight—hours since extended, as is the case with most large city radio stations. Programs followed by # originate at the network level—in this case, NBC-Red.

A.M.

8:00	Winter Wonderland	10:00	Household Hints
8:15	Your Home Town	10:15	Backstage Wife #
8:30	Party Line	10:30	How to Be Charming
8:45	Bandmaster	10:45	Hello Peggy
9:00	What's New in Milwaukee	11:00	Helen Gahagan
9:30	Morning Melodies	11:15	Blue Room
9:45	Today's Children	11:30	Behind the Mike
		11:45	Heinie [German band music]

P.M.

12:30	Rhythm Rascals	3:45	Road of Life #
12:45	Sidewalk Reporter	4:00	Friendship Circle
1:00	Livestock Reports, News	4:30	Kitty Keene #
1:15	Remote Control	4:45	News
2:00	Pepper Young's Family #	5:00	Jack Armstrong [children's action-adventure] #
2:15	Ma Perkins #	5:15	Heinie
2:30	Vic & Sade #	5:45	Sports Flash
2:45	The O'Neills #	6:00	Dairy Council
3:00	Around the Town	6:15	Uncle Ezra [country music] #
3:15	Guiding Light #	6:30	Easy Aces [comedy] #
3:30	Paul Skinner	6:45	Kilowatt Hour

(Here is the Monday schedule for the evening "prime time")

7:00	Burns & Allen [comedy] #
7:30	Firestone Program [music] #
8:00	Fibber McGee & Molly [comedy] #
8:30	Hour of Charm [female orchestra] #
9:00	Contented Hour [music] #
9:30	Glen Gray and his Casa Loma Orchestra #

Source: Milwaukee Journal radio station audience research report information for November 1937, based on 49,100 completed telephone calls comparing WTMJ with six other area stations. Material now on file with, and supplied through the courtesy of, the Mass Communication History Center of the State Historical Society of Wisconsin.

5•61 *Music and Variety*

Music remained the staple of most radio schedules. Several transcription companies, operated both by networks and some independents, offered local stations prerecorded music, sometimes assembled into programs. By early 1939 more than 575 stations subscribed to at least one transcription service, and nearly half of them used two or more. RCA's transcription operation probably accounted for 35 percent of the industry's business, although 25 or 30 companies had combined annual revenues of \$5 million in the late 1930s.

A station usually signed a contract with a transcription firm to deliver several hundred recorded musical selections—usually on 16-inch discs, running at 33 $\frac{1}{3}$ rpm, with approximately 15 minutes per side—to start, and then perhaps 50 additional selections a month. The transcription firm usually dealt with only one station in a particular market to avoid program duplication, and payment by the station was either a percentage of its gross revenues or a flat sum. While such material averaged only 10–15 percent of time on network-affiliated stations, nonaffiliated local stations used it much more, some for 80 percent of their schedules. Popular songs and instrumentals predominated, but all kinds of music were offered.

Although the use of music increased locally, classical musical programs declined in importance on the networks after the early 1930s. A notable exception was the NBC Symphony Orchestra, one of the outstanding cultural creations of radio in America. The orchestra was founded when David Sarnoff helped persuade Arturo Toscanini, the just retired conductor of the New York Philharmonic, to return from Italy to conduct ten concerts, the first one on Christmas night 1937. NBC hired

the best musicians possible to work in the new symphony orchestra. Three months later the network announced that Toscanini would lead the orchestra for another three years; but, as it turned out, the NBC Symphony continued for nearly 17 years until Toscanini's final retirement, well into his eighties, in 1954. The broadcasts normally originated from specially built Studio 8H, then the largest in the world, in the RCA Building in Rockefeller Center, and were broadcast on NBC-Blue on a sustaining basis, at the conductor's insistence. From 1948 the NBC Symphony was seen on television as well. After the NBC Symphony formally disbanded, the orchestra continued to play independently as the "Symphony of the Air."

Large dance bands were increasingly heard on both national and local programs. The 1930s were the "big band era," and many famous orchestras were heard first locally and then on the networks. Both industries benefited from such broadcasts, since the publicity of a major radio appearance attracted more people to the band's concerts. By 1937 the bands of Benny Goodman, Ozzie Nelson, Russ Morgan, Sammy Kaye, and Tommy Dorsey first played on network radio. *Your Hit Parade*, one of the top long-running radio programs, presented the most popular songs of the previous week, as determined by a national "survey" of record and sheet music sales, performed live by major singers and orchestras. The show began in fall 1935 and was sponsored on radio until 1953, and from 1951 until 1959 on television, by the American Tobacco Company's Lucky Strike (and, toward the very end, Hit Parade) cigarettes.

Local stations presented a wide range of live music, some stations supporting a full orchestra, and an increasing amount of recorded music. The conflict

between broadcasters and ASCAP (see 5.85) had a substantial effect on radio music in 1940–1941.

Compared to the highly professional variety programs, local or national *amateur hour* broadcasts presented unknowns who would sing, tap dance, or do imitations in the hope of making a career. Such programs were used as fillers for years. Although the quality was uneven, the audiences that had cheered hometown talent supported contestants from all over the country. The most famous amateur variety show, *Major Bowes and His Original Amateur Hour*, began on New York station WHN in 1934 and moved to NBC-Red in March 1935. Within a few months, it was the most popular program on radio—at one time reaching a near-unbelievable rating of 45 when 20 was more typical! It presented amateurs who went on to fame—including Frank Sinatra, who made his radio debut in this program's first year—and others who went down to defeat and anonymity. Bowes became known by his catch-phrases and for his abrupt, even brutal manner with a gong as an aural equivalent of the "hook" used to remove inept or stage-frightened performers. The program continued on radio until 1952 and went on television from 1949 to the late 1960s, with Ted Mack serving as MC after Bowes's death—and bears a family resemblance to the *Gong Show* of the mid-1970s.

Many other national and local programs were built around a single performer, almost always a male singer or comic, usually backed by a musical group and supplemented by weekly guest performers. Most of these variety stars were products of vaudeville, burlesque, legitimate theater, or music halls. One was Bob Hope, who began his weekly show on CBS in 1935.

Such variety programming re-

mained a network favorite, with little change, until inauguration of the army draft just before World War II gave a military slant to programs of the early 1940s. The *Army Show* (later the *Army Hour*), on NBC-Blue, *This Is Fort Dix* over Mutual, the Navy Band hour, and *Wings over America* were typical. The formats resembled earlier radio variety shows, with bits of song, humor, and chatter, but the participants frequently were military personnel, and the programs often originated from military camps and bases.

5•62 Drama

By far the most important network dramatic programming, in hours broadcast per week, was the woman's serial drama, or soap opera. Starting in 1935, the weekly hours of such fare increased sharply until, in 1940, the four networks combined devoted 75 hours a week to such programs, nine of every ten sponsored daytime network hours. These programs lasted 15 minutes, came on at the same time each weekday, and had soap and food manufacturers as sponsors. Typical of the longer running programs were *Back Stage Wife* ("what it means to be the wife of a famous Broadway star—dream sweetheart of a million other women"), which began in 1935; *The Guiding Light* (about a kindly cleric); *Lorenzo Jones* (inventor of useless gadgets); *Our Gal Sunday* ("Can this girl from a mining town in the West find happiness as the wife of a wealthy and titled Englishman?"); and *Road of Life* (doctors and nurses, although it began as the tale of an Irish-American mother's attempt to raise her children). In each case, domestic life was emphasized with its ups, and more usually, downs. Many of the actors and

actresses played the same parts for decades. For a portion of each day, they performed a live, convincing, emotion-filled episode with little rehearsal, but their evenings were free for the stage or other professional activities. Behind many of the serials was the husband and wife team of Frank and Anne Hummert, who originally wrote all their own work but eventually employed dialogue writers to work within their character development and story lines. Elaine Carrington and Irna Phillips also wrote “soapers”—sometimes several at the same time.

The typical serial format was wonderfully simple: a brief musical introduction played on the studio organ, a narrator opening the day’s episode with a recap of what had happened before, two segments of action separated by a commercial break, and a closing word from the narrator suggesting the problems ahead. Dialogue and organ music were somber and simple; story progress was very slow, giving time for character development and allowing a listener to miss an episode or two painlessly. Audiences were loyal, and many programs lasted 15 or more seasons, until radio’s programming character changed in the 1950s. Listeners to soap operas were among the first studied by social psychologists, and much criticism was levied at the genre in 1940 and 1941, as it was nearly impossible to schedule anything else between 10 A.M. and 5 P.M. These complaints dropped off as the number of serials decreased during the war years.

“Prestige” drama increased in the 1930s. These programs usually were “anthologies” offering different stories with new casts each week, sometimes adaptations from other media, but often original radio plays. Writers such as poet Archibald MacLeish, later Librarian of Congress, and unknown authors such as Nor-

man Corwin and Arch Oboler gained recognition almost overnight. Prestige series included the *Columbia Workshop* of experimental drama on CBS, started late in 1936, and the more conventional *Lux Radio Theater*, which presented such stars as Helen Hayes, Leslie Howard, and an unknown player named Orson Welles in hour-long versions of current films.

Welles at twenty-three was the guiding light behind a new CBS series in fall 1938, the *Mercury Theater on the Air*. As writer, director, and star, he built up a company of actors whose names were famous for decades: Joseph Cotton, Agnes Moorhead, Everett Sloane, Ray Collins. His Sunday evening, October 30, 1938, Halloween program probably ranks as the most famous single radio show ever presented. It was an adaptation by Welles and Howard Koch of H. G. Wells’s science fiction story “War of the Worlds.” The location was changed to northern New Jersey, the time was moved to the present, and, even more important, the narrative was changed to reflect radio’s format. Listeners who tuned in to the program’s beginning, or who listened carefully to the between-acts announcements, understood these circumstances. But those who tuned in late—and many had a habit of listening to the first few minutes of ventriloquist Edgar Bergen and his dummy Charlie McCarthy on NBC before tuning over to CBS for the play—were due for a surprise. The program in progress seemed to feature a band performing in a hotel. A few moments later, an announcer broke in with a “news bulletin” saying that a gas cloud had been observed on the planet Mars. Then back to the music; another interruption, asking observatories to keep watch; more music; an interview with a “noted astronomer” on the possibility of life on Mars (unlikely); more music—and, suddenly, a bulletin saying that a large me-

teorite had fallen in the vicinity of Grovers Mill, New Jersey. The pace built in a series of news bulletins and on-the-spot reports of the opening of the cylindrical "meteorite," the emergence of the Martians, the assembly of Martian war machines, the rout of U.S. military forces, and government reaction. Reports of casualties, traffic jams, transmissions from hapless military pilots, ominous breaking off of on-the-spot reports, the later report of the "death" of the field reporter, and use of familiar names and places—all gave it reality. As the Martian war machines headed toward New York to discharge their poison gas over the city—to the sounds of fleeing ocean liners, the last gasps of a newsman atop the broadcasting studio, and the cracked voice of a solitary ham radio operator calling "Isn't anybody there? Isn't anybody?"—many listeners did not wait to hear the mid-program announcement that it was all a hoax. By 8:30, thousands of people were praying, preparing for the end, and fleeing the Martians.

These reactions were not silly, although it may look that way today. The pacing of the program undermined critical faculties. It convinced the listener that a reporter had traveled the miles from Grovers Mill "in ten minutes," when less than three minutes actually had elapsed. Already sure that mobs were fleeing, listeners who looked out their windows and saw lots of people going about normal pursuits assumed that everyone was trying to get away from the Martians, just as the radio said. If no one was in sight, they assumed that everyone else had fled and left them behind. Few heard the three announcements of the program's fictional nature or the last half-hour, which was mostly a monologue by Welles, as a scientist who believes that he is one of the few survivors and who observes the demise of the Martians from the effects of

earthly germs and bacteria. If they had heard this obviously dramatic material, many persons might have caught on. In the East, especially near the "landing site," thousands of people—a small proportion of the population but a large number nevertheless—called police, fled their homes, or otherwise reacted as though the invasion were real.

This panic had a number of causes, notably the way the program's "Halloween prank" nature was glossed over in the introduction. Afterwards researchers learned that many listeners did not try to double check the "news" on another station or telephone friends; and that others, who found normal programming elsewhere on the dial, decided that these stations had not yet received the word. The panic was also a reaction to the "Munich Crisis" just one month before, when Americans had been glued to their radios expecting the world to go to war (see 5.63).

Welles was amazed but only slightly abashed at the program's impact. The FCC let it be known that it would not consider such "scare" programs and formats as broadcasting in the public interest. Although "War of the Worlds" was rebroadcast recently in the United States as a "period piece" without much effect, its original adaptation broadcast in other countries brought the same sort of panic. Several persons were killed in a riot in South America, when resentment over having been fooled boiled over. This drama showed better than any other program or episode the impact of radio on society—"if it was on the radio, then it must be true."

Thrillers and situation comedies filled more network time per week than any other form of drama. Adventure programs, starting in the early 1930s (see 4.63), were heard both in the evenings, as crime-detective shows for adults, and in the late

Orson Welles's Halloween Broadcast: 1938 / Orson Welles narrated the famous "War of the Worlds" broadcast on October 30, 1938—creating the kind of panic reported in the *New York Times* the following day. Photo credit: Culver Pictures, Inc.



NEW YORK, MONDAY, OCTOBER 31, 1938.

Radio Listeners in Panic, Taking War Drama as Fact

Many Flee Homes to Escape 'Gas Raid From Mars'—Phone Calls Swamp Police at Broadcast of Wells Fantasy

A wave of mass hysteria seized thousands of radio listeners throughout the nation between 8:15 and 9:30 o'clock last night when a broadcast of a dramatization of H. G. Wells's fantasy, "The War of the Worlds," led thousands to believe that an interplanetary conflict had started with invading Martians spreading wide death and destruction in New Jersey and New York.

The broadcast, which disrupted households, interrupted religious services, created traffic jams and clogged communications systems, was made by Orson Welles, who as the radio character, "The Shadow," used to give "the creeps" to countless child listeners. This time at least a score of adults required medical treatment for shock and hysteria.

In Newark, in a single block at Heddon Terrace and Hawthorne Avenue, more than twenty families rushed out of their houses with wet handkerchiefs and towels over their faces to flee from what they believed was to be a gas raid. Some began moving household furniture.

Throughout New York families left their homes, some to flee to near-by parks. Thousands of persons called the police, newspapers

and radio stations here and in other cities of the United States and Canada seeking advice on protective measures against the raids.

The program was produced by Mr. Welles and the Mercury Theatre on the Air over station WABC and the Columbia Broadcasting System's coast-to-coast network, from 8 to 9 o'clock.

The radio play, as presented, was to simulate a regular radio program with a "break-in" for the material of the play. The radio listeners, apparently, missed or did not listen to the introduction, which was: "The Columbia Broadcasting System and its affiliated stations present Orson Welles and the Mercury Theatre on the Air in 'The War of the Worlds' by H. G. Wells."

They also failed to associate the program with the newspaper listing of the program, announced as "Today: 8:00-9:00—Play: H. G. Wells's 'War of the Worlds'—WABC." They ignored three additional announcements made during the broadcast emphasizing its fictional nature.

Mr. Welles opened the program with a description of the series of

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afternoons, as action-adventure serials for children. These live, mostly network shows could be technically complicated, with large casts, sound effects, and split-second timing. Programs included the true story—re-creating *Gangbusters* starting in 1935, whose loud opening of sirens, machine-gun fire, and marching feet gave rise to the phrase “coming on like *Gangbusters*”; *Mr. Keen, Tracer of Lost Persons*; and *I Love a Mystery*, which had one of radio’s most loyal audiences. The last was written by Carlton E. Morse, writer of the enduringly popular *One Man’s Family*. *Mr. District Attorney*, a program starting in 1939 which opened with the DA reciting his oath of office, provided a generation with the concept of the law as protector as well as prosecutor.

Programs aimed at children included *Jack Armstrong—The All-American Boy*; *Tom Mix*, a cowboy-adventure program; *Captain Midnight* and *Hop Harrigan*, both with pilot-heroes; *Terry and the Pirates*, based on the Milton Caniff comic strip; and a number of other serials that made the American “children’s hour” far different from the period of silence that the British offered for several decades. Two of the most important children’s adventure programs were not serials. *The Lone Ranger* and *The Green Hornet*, which began over Mutual in 1938, were written and acted by the team at WXYZ, Detroit (see 4.63). Indeed, the publisher-hero Green Hornet was identified as the Lone Ranger’s grand-nephew! *The Green Hornet* used a classical

Radio’s Comedy Stars of the 1930s / Two of radio’s longest running comedians were Jack Benny (shown here—in the left photo—with his wife and comedy partner, Mary Livingstone) and Fred Allen (with his wife Portland Hoffa, in the right photo). The two—who actually admired each other—had a running on-air “feud,” based on their very different approaches to radio comedy. Another ex-vaudevillian was George Burns, who supplied straight lines to his zany and confused wife, Gracie Allen (see picture at the beginning of this chapter). With the exception of Fred Allen, who appeared only sporadically on television, all of these stars made the transition from radio to television in the late 1940s and thus had broadcast careers of more than three decades. Photos courtesy of National Broadcasting Company, Inc.



music theme and a hard-punching opening: "He hunts the biggest of all game! Public enemies who try to destroy our America. . . . With his faithful valet, Kato, Britt Reid, daring young publisher, matches wits with the underworld, risking his life that criminals and racketeers, within the law, may feel its weight by the sting of—the Green Hornet!" Until FBI chief Hoover objected, the Green Hornet's targets were "public enemies that even the G-Men cannot catch." When the United States entered World War II, the faithful valet-chauffeur Kato was quickly changed from Japanese to Filipino.

Radio's half-hour situation comedies were a staple for years. *Li'l Abner* began over NBC in 1939, originating in

Chicago as many programs then did; Fanny Brice, about whom the musical *Funny Girl* was written, created her immortal *Baby Snooks*, the child demon who created crisis after crisis for her father and her baby brother Robespierre; *Blondie*, a 1939 CBS entry based on the Chic Young comic strip, featured the tribulations of Dagwood and Blondie Bumstead—another example of broadcasting's penchant for weak father figures; and *Henry Aldrich*—the misadventures of a crack-voiced adolescent—after appearing for some years as a segment on other programs, aired on its own over NBC-Blue in 1939.

Except for daytime serials and thriller programs, most network drama—anthology, or serial like *One Man's Family*

Oddly popular on radio, where the visual trick of ventriloquism could not be seen, were Edgar Bergen and his wooden dummy, Charlie McCarthy—though the wise-cracking dummy clearly walked away with the show. Famed comedy star W. C. Fields is about to perform a frontal lobotomy on McCarthy—the two traded barbs on the air for years. Photo credit: Culver Pictures, Inc.



Suggestions for Hopeful Radio Playwrights / This copy, reproduced exactly as the Aubrey, Moore and Wallace agency of Chicago sent it out to those requesting it, shows some of the limitations and problems of writing for a prime-time radio network drama program. Note some of the period taboos, such as women smoking. Similar, though usually much longer, guidelines exist for current television programs—but the price paid to authors has increased sharply from the \$100 of 1938.

Suggestions for
Radio Playwrights
Campana's "First Nighter" (Friday NBC)
and "Grand Hotel" (Sunday NBC)

Regarding BOTH Programs

Both of these programs are very successful. They have a large audience. During the years they have been on the air we have received hundreds of thousands of letters all of which have aided us in knowing what our audiences like. Please keep this in mind as you read these suggestions.

Our radio listeners are primarily the family type of audience. Consequently, we are interested in

Comedy and Farce
Melodrama
Light and Heavy Romances
Mystery
Adventure

that will provide wholesome entertainment for all members of an average family. This means there are certain restrictions. As a suggestion, we offer a few taboos:

Sex
Profanity
Drunkenness or even drinking
Smoking by Women
Glorification of crime of
criminals
Anything that will offend
members of racial, political
or religious groups.

On the other hand, there is a wide range of possibilities with real live characters, with plenty of action and dramatic conflict.

A few pointers:

1. Plays which have a definite love interest or a mystery with an original "twist" before the ending are particularly desirable. While the conventional happy ending is not essential, it is generally conceded to be better box-office.
2. "Plant" your characters -- i.e., tell us who they are and where they are in the fewest possible words as soon as possible after their entrance. Do not use an announcer, narrator, or interpreter to describe scene or play. Characters must do all this by their lines.

-2-

3. Do not shift scene unnecessarily. On the other hand, do not allow the whole play to become static.
 4. If you have any good ideas on sound effects, write them in -- otherwise leave it alone. This part of the production is quite efficiently handled during rehearsals.
 5. Radio drama is of necessity a natural and intimate form of entertainment, dialogue should not be stiff, or stagy. Make your characters real people.
 6. Motivate all your characters and situations. Also remember that action is more entertaining than talk. Long conversations, unbroken by action, do not make good shows.
 7. There is an efficient orchestra included in these programs, so that if you understand something about music and would like to use a little in your story, do so. The leading man, Don Ameche, has a pleasant and appealing singing voice and has successfully put over several roles in which he worked as a night club entertainer or a song writer, etc., etc.
 8. When you have completed the first draft of your play -- read it over to yourself and then to someone of average intelligence and carefully note the reaction ... do they grasp the essentials of the plot?... does it sustain their undivided interest and attention? The most important requirement of a play is that it provide good entertainment. It must not be obvious, dull, trite, "draggy", etc.
 9. Put plenty of color, action and motivation into your plot but keep the whole structure clear and well fo-cused. Brevity is the soul of wit and simplicity is the essence of good showmanship.
 10. Suspense is important in order to carry the audience over the intermissions and make them await eagerly the climax of the play.
-

-3-

FIRST NIGHTER (Three Acts) This is the "opening night" in the "Little Theatre Off Times Square"

Dramatic construction should be on an ascending line with the "Big Scene", if possible, for the third act. As musical interludes occur between each act, in this series, it is essential to build up the endings of Acts 1 and 2 in such a manner as to leave a good carry-over. Usually suspense is the best method.

Each act should average between five and six minutes actual playing time, totaling 16 or 17½ minutes for three acts. A manuscript of 2500 or 2600 words, averaging from 825 to 900 words per act makes the best play.

Players

Don Ameche -- leading man
June Meredith -- leading lady
Clifford Soubier -- an experienced heavy, villain or "character" actor. Very good in negro dialect also.

Other actors vary according to the requirements of the script. It is desirable to have no more than four or five characters in order to keep the plot clear and understandable by the audience. Odd voices, taxi drivers, doormen, etc. may be used at your discretion.

GRAND HOTEL (Two Acts.)

Often the scenes are associated with or start in "Grand Hotel" anywhere.

A musical interlude occurs between the acts and it is essential that the ending of Act I be built up to leave a good carry-over.

The acts should be evenly divided with roughly 21 or 22 minutes for the total length, figuring about 150 words to the minute.

Players

Don Ameche -- leading man
Anne Seymour -- leading lady
Other actors vary according to the requirements of the script. It is desirable to have no more than four or five as more than that number may become confusing to the audience.

- - x - -

Note: Authors are required to furnish only the play. Do not worry about the "Shell" or "Framework" of the program.

For plays produced the author is remunerated on the day following the broadcast. Price \$100 each.

Please type your name and address clearly on the manuscript.

Address scripts to
L. T. Wallace, Vice President
AUBREY, MOORE & WALLACE, INC.
410 North Michigan Avenue
Chicago, Illinois.

and *Those We Love*—occurred in the evening. Only the largest stations produced their own dramatic programs regularly, most being content with network offerings, although many stations supplied dramatic or sound effects for commercials and special programs.

To an audience reared largely on movies, amateur theatricals, and traveling companies, radio provided something new and fascinating. The resulting loyal audience was very attractive to advertisers. Since it could perceive radio only by ear, the audience had to use its imagination to fill in the setting and the action. This it did well with the help of numerous musical and sound-effect conventions. Everyone understood transitions of time and space; the absence of carpet in radioland homes told the listener when somebody was entering or leaving a room. A filter that removed some of the audio frequencies placed a voice on the telephone; a bit more filter and some reverberation or "echo" would transport a ghost to fantasyland. But without the audience's imagination, radio drama never would have succeeded.

5•63 News

By the late 1930s, the providing of news broadcasts and commentary programs had become a recognized radio function, as the Press-Radio war ended and tensions in Europe and the Far East mounted.

The Biltmore Agreement of late 1933, which was intended to end the Press-Radio war (see 4.64), proved short-lived. As soon as the networks stopped gathering and reporting news, local stations or groups of stations took over. Transradio Press Service, Inc., a news agency whose news could be sponsored, served more stations in early 1935 than the Press-Radio

wire authorized by the Biltmore Agreement. Both UP and INS copied this service in 1935, leaving only AP, closely controlled by the newspaper industry, as a holdout. To save wire line costs, Transradio, UP, and INS sent short, telegraphic dispatches that required rewriting at the station. In July 1936 UP became the first news service to offer a special radio wire transmitting news summaries written and edited for radio delivery. By 1938 UP and INS had many more subscribers than Transradio, and many stations subscribed to more than one service. The Press-Radio wire, restrictive in news coverage and prohibiting sponsorship, withered and died in 1938 in the face of such competition—and the "war" ended with it. AP began to let newspaper-owned stations use its news on the air in 1939, opened up its news service and permitted sponsorship on all stations a year later, and began a special radio wire in early 1941. The attempts of the press to limit radio news failed because most people saw them correctly as limiting news dissemination on a competing medium. As real war drew nearer, people wanted more news. Print media groups tried repeatedly in the late 1930s to regain control of radio news, but they had lost the issue already.

In the late 1930s, individual radio stations across the country began to offer news programs varying in length and depth. Most stations had local news service, sometimes no more than headlines, often in cooperation with a local newspaper supplemented by one or more of the wire service radio wires. The FCC's 1938 programming survey showed that one-tenth of broadcast programming was news; with special events coverage added, radio devoted one-sixth of its programming to news and public affairs; and more news and special events programs originated locally than were supplied by national net-

works. Compared to newspapers, radio carried more international and crime-related news but fewer social events and stock and commodity market reports. Radio's ability to report natural and man-made disasters faster than the press doomed the newspaper "extra."

In the networks, the end of the Press-Radio war brought expansion of both domestic and foreign news reporting. NBC news director A. A. Schechter earned a reputation for getting stories through skillful use of the long-distance telephone and producing color or human interest stories rather than *hard news*. Both networks covered sports events, talks from famous people beamed from abroad by shortwave and then rebroadcast, a singing mouse contest, launching of ocean liners; both networks were establishing the personnel and technical means for regular international reporting. CBS news director Paul White directed César Saerchinger to cover the 1936 abdication of Great Britain's King Edward VIII and the 1937 coronation of King George VI. This latter broadcast may have been the first heard around the world, thanks to the British Broadcasting Corporation. In another memorable CBS broadcast, H. V. Kaltenborn reported on a 1936 skirmish in the Spanish Civil War while hiding in a haystack between the two armies; listeners in America could hear bullets hitting the hay above him while he spoke. In 1937 twenty-eight-year-old Edward R. Murrow took Saerchinger's place as CBS European director, arranging educational talks and other broadcasts from his base in London.

News reporting from abroad naturally picked up in quantity as diplomatic tensions increased. Radio reported the latest actions of dictators Hitler and Mussolini, and the often weak ripostes from Britain and France. Upon Germany's March 1938 annexation of Austria, CBS news di-

rector White devised a new broadcasting technique. Reporters in four or five European nations would stand by microphones connected to shortwave transmitters and discuss events of the day from their various vantage points, frequently being able to hear and comment on their colleagues' reports, coordinated by transatlantic radio and telephone from New York. Because this was done live in the evening on the East Coast of the United States, the reporters had to broadcast in the wee hours of the morning. CBS presented sixteen such roundups in the six days of the Austrian crisis. The techniques developed and personnel trained became vitally important when Hitler threatened Czechoslovakia in September 1938. NBC provided more than 460 broadcasts in those 18 days of the Munich crisis, including Max Jordan's scoop—a broadcast of the complete text of the four-power agreement just minutes after it was signed. At CBS, H. V. Kaltenborn—who could readily translate into English several languages used during the crisis—won acclaim by doing 85 broadcasts over the 18 days. He virtually lived in Studio 9, having food brought in and sleeping on a cot. News Director White orchestrated the coverage, pulling in as needed wire reports, CBS reporters abroad, and commentary from New York or Washington. In those 18 days of speeches, threats, and communiqués, Americans grew used to news bulletins cutting into their entertainment programs at any hour. Kaltenborn later said that he felt the crisis passed—only for a year as it turned out—because radio had mobilized public opinion against war. However, the audience's new faith in radio reporting was tested a month later when the Welles broadcast (see 5.62) scared millions.

The networks' news organizations were put to the test in 1939–1941 as war came to Europe and spread. By late 1939

CBS had 14 fulltime employees in European capitals, headed by Murrow in London, Eric Sevareid in Paris, and William L. Shirer in Berlin. NBC had a similar staffing pattern. When war came, both networks were able to provide a running commentary: Murrow from London on the beginning of the war . . . NBC providing eyewitness live coverage of the bleak winter on the Russo-Finnish front . . . NBC's scoop live from Montevideo harbor in December when the Germans scuttled their pocket battleship *Graf Spee* . . . conflicting reports from all over as Hitler invaded the low countries, Scandinavia, and France in 1940 . . . the combined broadcast by NBC's William Kerker and CBS's William L. Shirer in the forest of Compiègne in June 1940 when France surrendered to Hitler (most other correspondents were waiting for the news in Berlin) . . . a *London after Dark* broadcast over CBS in August 1940 in the midst of a German air raid at the height of the Battle of Britain. . . .

Wartime censorship restrictions forced many on-the-spot reports to be recorded originally, but most were live—a tribute to the newsmen's professionalism and the combatants' trust in their good faith. Edward R. Murrow led the way by proving to British censors, through trial broadcasts for several nights in a row, that he could broadcast without giving away military information. In his nightly "This . . . is London" reports to CBS, Murrow, from 1939 to 1941, probably gave Americans their best feel for the war in England. Night after night, he told how the war affected typical Londoners—in their homes, hiding from bombs in the London subway system, or working in factories turning out goods for the war.

Not only did radio report the news faster than competing media, it often reported directly from the scene, with the added color and interest of interviews and

background sounds. Perhaps radio's outstanding performance in a domestic crisis was its cooperative coverage of the disastrous Ohio and Mississippi Valley floods of early 1937. Stations that were flooded out provided their personnel to stations still on the air. The latter scrapped program schedules and stayed on the air day and night directing flood victims to food and shelter. Many stations conducted fund-raising efforts to alleviate suffering. Some stations became arms of official agencies and provided a message service that normally might have been illegal point-to-point use of a broadcasting station. Reporters fanned out over the entire area, reporting news to local stations and networks alike. Radio's immediacy and portability were amply demonstrated.

In May 1937 Herb Morrison of Chicago station WLS, making a disc recording for archival purposes, watched the German airship *Hindenburg* come in for a routine landing at Lakehurst, New Jersey. As those on the ground watched in horror, the giant hydrogen-filled dirigible caught fire and, in less than a minute, burned to a mass of twisted girders on the ground, with the death of 30 passengers and crew. New York station WHN carried the news first, some eight minutes after the fire, and CBS and NBC followed within a half-hour. Morrison's recording was one of the dramatic events in radio's history. As the shock of this unexpected catastrophe overwhelmed him, he sobbed, "This is one of the worst catastrophes in the world . . . oh, the humanity" but stayed at his post and recorded some thirty minutes of the aftermath—between stints of helping in the rescue work. The recording, rushed back to Chicago and aired on WLS the next morning, was so newsworthy that the three networks temporarily suspended their no-recordings rule to play portions of it.

To cover foreign and domestic

news adequately, all the networks and many larger stations began to hire news-men-commentators to report and analyze the rapid and bewildering events around the world. News commentary had been exempted from the short-lived Biltmore Agreement ban on sponsored news programs, and Lowell Thomas had broadcast on NBC-Blue since 1930 (continuing until June of 1976). Boake Carter and H. V. Kaltenborn had been on CBS for several seasons. Other commentators broadcasting between 1935 and 1939 were Gabriel Heatter, famous for his coverage of the Lindbergh kidnaping trial (see box below) in the early 1930s; newspaper columnist Drew Pearson; Dorothy Thompson, the first important woman commentator; Raymond

Gram Swing; conservative Fulton Lewis, Jr.; veteran broadcaster Norman Broken-shire; and respected newspaperman Elmer Davis.

The war increased news broadcasting in America. From some 850 hours of news and on-the-spot news specials broadcast by all networks in 1937, the yearly total went up to 1,250 hours in 1939 and nearly tripled two years later to 3,450 hours. Evening commercial network time devoted to commentators, news, and talks went from 6.7 percent in winter 1938–1939 to 12.3 percent in winter 1940–1941. CBS consistently provided the most news programming in 1937–1941, with NBC-Red and -Blue jockeying for second position and Mutual a distant third. Nearly all radio

The Lindbergh Kidnaping Case: Trial by Circus?

Early in 1932, the nineteen-month-old son of aviation hero Charles Lindbergh was kidnaped from the Lindbergh estate near Hopewell, New Jersey. The crime attracted the attention of the country for over ten weeks as the police and a weird variety of hangers-on attempted to recover the child by making payment to the kidnaper. They all failed, and the child's long-dead body was found on May 12. The kidnaper had not been found, and newspaper, newsreel, and radio reporters withdrew from the story.

Two-and-one-half years later, however, Bruno Richard Hauptmann was arrested in New York in the act of passing one of the ransom bills. That event, and the trial of Hauptmann for the kidnaping early in 1935 brought back the press in droves to focus the nation's concentration on the small town of Flemington, New Jersey, where the trial took place. Hundreds of reporters and photographers squeezed

into the courtroom and surrounding rooms in an attempt to bring every event of the trial to the country's newspaper readers and radio listeners. Photographers—many of whom were free-lance and aggressive—were all over and the scene was pandemonium. Near the front rail with the press was Gabriel Heatter, a reporter for the new Mutual radio network, given this special place because the judge's wife enjoyed his broadcasts! The trial lasted for six weeks and was front-page news for most of that time.

Late on the evening of February 13, 1935, the verdict came in and was soon flashed across the country—Hauptmann was found guilty and sentenced to die. (An Associated Press employee using a secret radio transmitter in the courtroom to get a scoop on rivals got the verdict wrong, and about ten minutes later AP had to send out a correction. The employee was fired.) Heatter's most famous moment came in early 1936

stations scheduled regular news programs by 1940-1941, with a few providing summaries every hour.

5•64 *Political Broadcasting*

Radio as a political instrument in the United States came into its own with the first administration of Franklin D. Roosevelt. Taking with him a habit from his New York governorship, F.D.R. began a series of "Fireside Chats" with the American public on the problems of Depression-hit America. There were 28 such broadcasts—8 in each of his first two terms, and 12 in the third, wartime term, nearly all of them half-hour programs

broadcast in prime time—and they generally received ratings near the top. Roosevelt had a natural approach to radio, and his words came across more as a conversation between friends than a political speech. In the third "chat," when he stopped for a moment and drank from a glass of water, it seemed perfectly natural and correct.

In the 1936 presidential election campaign, a desperate Republican party tried a number of innovative uses of radio. The GOP nominee, Kansas governor Alfred Landon, submitted to a lengthy radio interview just prior to his nomination. More than 200 stations carried the convention in Cleveland, and the convention floor bristled with microphones. Once the cam-

when Hauptmann finally went to the electric chair. Holding scripts to cover four eventualities—escape, suicide, reprieve, or delay—Heatter had to ad-lib for three-quarters of an hour when the execution was delayed—all this live on a coast-to-coast hookup.

The trial was important not only for its titillating effect on American lives in 1935 but for what came out of it—severe restrictions on reporting of courtroom events by radio and photographers (after 1952, such rules included television). Developed by the American Bar Association as a canon or rule of judicial procedure, Canon 35 limited radio access to the courtroom ostensibly to alleviate the circus-like atmosphere prevalent during the Hauptmann trial. Canon 35, now Canon 3A(7), is still hotly debated as a conflict of the First (free speech) and Sixth (fair trial) amendments to the Constitution. And it all dates back to that overcrowded courtroom.



The heavy media coverage of the Lindbergh trial is evident in the massed photographers facing the jury. United Press International Photo.

campaign got underway, frequent spot radio commercials emphasized aspects of the GOP platform. In October, Senator Arthur Vandenberg presented a "debate" on CBS in which he asked questions of an absent President Roosevelt and then played carefully selected recordings of earlier F.D.R. speeches and promises. The program violated CBS policy against recordings, and many of the network's affiliates either refused to carry it or cut out during the program when they realized its unfair approach. Finally, when the networks refused to sell the Republicans time after the convention, the GOP used Chicago station WGN to present an allegorical play depicting its campaign promises.

On the other hand, the Democrats used nothing special—only F.D.R. That consummate political speaker had huge audiences listening to his broadcast speeches. On election night, the networks initially interrupted regular programs with ballot bulletins from time to time, supplementing with commentary. CBS went full-time to election results at 10:30 P.M., while Mutual reported its first election that year.

The second Roosevelt administration showed increasing use of radio, not just by the President and his cabinet but by numerous federal agencies as well. The Office of Education, for example, produced 11 educational network programs; the Federal Theater Program—part of the Depression-spawned Works Progress Administration—produced more radio programming in its short life than any other agency; the departments of Agriculture and Interior supplied recorded programs to individual stations. Many local stations also benefited from the forecasting services of the U. S. Weather Bureau, and produced local programs featuring county agricultural agents.

The 1940 election campaign saw F.D.R. run again, this time against Repub-

lican Wendell Willkie, a little-known utilities executive before a whirlwind public relations campaign had propelled him into the limelight. Willkie pushed himself so hard that his voice weakened during the campaign—perhaps one of the reasons why Roosevelt consistently got higher ratings. Surveys conducted during this campaign suggested that most voters now considered radio more important than newspapers as a source of political news and tended to listen most to the candidate they favored; in other words, radio strengthened voters' predispositions. On election eve the Democrats mounted a special radio program of speeches, party propaganda, and entertainment by stage, screen, and radio stars. Fulltime election coverage, as in 1936, came after the regular prime-time entertainment, although bulletins were provided throughout the evening. Human interest pieces and voter interviews were more common than in previous years.

Political broadcasting was not limited to the presidential campaign. Louisiana Senator Huey Long made anti-F.D.R. populist speeches until his 1935 assassination. Like Roosevelt, he had an informal approach, inviting listeners to call a friend or two and tell them Huey Long was on the air, and then delaying the meat of his address for the next several minutes. Catholic radio priest Coughlin (see 4.66), after promising to leave the air in 1936 if his third-party candidate got less than nine million votes—he got less than one million—came back to rail against the New Deal. He became increasingly rightist, criticizing Jews and defending many of the tenets of Nazism, until pressure from the Church hierarchy and other sources forced him off the air.

Common on local stations were talks and discussions of local and national topics of interest. Such programs were in-

expensive and easy to produce, particularly in college towns where professors were willingly drafted into occasional radio commentary. One of the better-known national programs, *The University of Chicago Roundtable*, began in 1931, went network (NBC) in 1933, and lasted for nearly 25 years. The surprisingly popular format consisted of faculty members and, occasionally, distinguished guests discussing a current topic. This program often outrated commercial programs and drew substantial mail from listeners seeking transcripts of programs. Another program of this type, NBC's *America's Town Meeting of the Air*, first aired in 1935 and involved members of the studio audience expressing their opinions on important issues.

5•65 Other Programs

Popular local station programs included man-on-the-street interviews and call-in interview programs, during which listeners could request a favorite musical selection or converse on an announced topic with a program host. People listened and participated because they enjoyed hearing themselves and other ordinary people on the radio.

Common both to local and network schedules were the nearly obligatory Sunday morning religious services, typically a live remote broadcast from a community church.

Some children's programs had large audiences. Featuring storytelling and

Remote Broadcasts Become Truly Portable /

This hand-held transmitter, touted by NBC in 1936 as the "smallest practical radio broadcasting station ever devised" was used in covering the national political conventions (including the Socialist) of that year. It liberated the reporter from wires connected to a companion staggering under the weight of a "portable" backpack transmitter, and permitted the announcer to "wander freely about." Forty years later, however, all of the components—microphone, amplifiers, batteries, transmitter, antenna—in the 1936 device—and additional cueing circuits from the director back to the reporter—were contained in a lightweight telephone operator-type headset, with the transmitter itself a small box somewhat smaller than a cigarette pack sticking above the earphone with a tiny antenna waving jauntily above. Photo courtesy of Broadcast Pioneers Library and National Broadcasting Company, Inc.



music interspersed with commercial announcements, they made ingenious use of radio's aural qualities and their ability to stimulate the imagination.

On the networks, quiz and human-interest programs grew on prime time from two to ten hours a week from 1935 to 1941 but were less important during daytime hours. Some quiz programs used audience members as participants and others used professional panels, but each offered human interest, drama, and an opportunity for the listener to test himself and occasionally outguess the participant. Major growth of this genre came in 1938 with the arrival of *Kay Kyser's Kollege of Musical Knowledge*, a combination musical-variety and quiz format; the urbane *Information, Please!*, whose professional panel tried to answer questions sent in by the audience; *Dr. I.Q.*, whose host, broadcasting from theaters around the country, offered "ten silver dollars for that lady in the balcony if she can tell me. . . ." In *Truth or Consequences*, which aired in 1940, willing contestants from the audience who answered silly questions incorrectly had to perform silly stunts as a consequence.

5.7 Systematic Audience Research

In the late 1930s, the radio audience continued to grow, such that radio was readily accepted in most rooms in the house (and increasingly in the car). That growth in size led to higher rates to advertisers—who demanded more refined research about the audience to justify their increased expenditures. As the number of listeners increased, so did information about who listened—and why.

5.71 *The Radio Receiver*

The years 1935–1941 saw the radio audience grow by seven million homes to

a total of 28.5 million, or 81 percent of American homes as compared with 67 percent at the start of the period. At the same time, a previously insignificant element of the radio audience grew even more rapidly: by 1941, 7.5 million automobiles, more than 27 percent, were equipped with radio—as compared with 9 percent in 1935. By 1938 the United States housed half the world's radio receivers, and more homes had radios than telephones, vacuum cleaners, or electric irons. The number of sets had grown by more than 100 percent since 1930.

Philco (see 4.71) remained behind RCA as a seller of radios until 1940, when it sold an equal volume of sets. Heavy promotion, pioneering battery-operated portable (but heavy!) radios and automobile radios, and aiming a line of efficient battery radios at rural listeners—all helped make Philco the growing giant of the period. Next in importance was Zenith, whose dynamic president Commander Eugene F. McDonald preferred aggressive selling and concentration on the home radio market to diversification. Here, too, innovations brought success—large, round, and easily read dials on radios starting in 1935, a simple radio antenna to improve reception, and an inexpensive shortwave-AM portable radio. Another relatively new firm, Emerson Radio, was primarily responsible for introducing the small, inexpensive table radio in 1933, a type which had almost four-fifths of the home radio market by 1941. Prices kept getting lower until, by 1939 and 1940, Emerson was marketing small sets at under \$10—a price that naturally encouraged many families to have more than one set. Another aggressive firm, Motorola, moved into the automobile market and by 1941 was selling about one-third of all car radios, offering push-button sets tailored for specific car instrument panels. The hall-

mark of all these firms was aggressive salesmanship and price cutting rather than major technical development.

The onetime leader in the radio receiver field, RCA, was losing out in other fields as well. While it remained the largest maker of radio tubes in 1941, Sylvania and Raytheon were moving in on this market; Magnavox and other firms were taking part of RCA's loudspeaker business. Mail order firms frequently cut prices and traded for profit rather than loyalty to a given manufacturer. Part of RCA's problem was the long antitrust litigation of the early 1930s, which resulted in GE and Westinghouse starting to manufacture radio sets independently in 1935. Other firms once important in radio set manufacture, such as Grigsby-Grunow and Atwater Kent, disappeared during the Depression. Crosley declined sharply. Increasingly tight competition among the surviving firms led to narrow profit margins and little basic research. Radio circuits became standardized; parts were frequently interchangeable, and manufacturing techniques were streamlined and simplified. Many firms sold similar small table models, chairside radios, large floor consoles—some with phonographs—and automobile radios. The major results: more reliable radios at low prices and a growing multi-set radio audience.

5•72 *Audience Patterns*

By 1938 more than 91 percent of urban homes, and nearly 70 percent of rural homes, had radio. Half the homes in the country had at least two radios, and there were few differences in regional distribution. Radio was nearly universal in higher income homes, but even 57 percent of homes with income of less than \$1,000 a year had at least one set. Radio was

played in the average household more than five hours a day.

Urban and rural audiences used radio differently. Although fewer rural homes had sets, those with receivers tended to listen a few minutes more each day than urban homes. However, because of the dawn-to-dusk working schedules of farmers, rural audiences listened less than urban audiences in the evening—a pattern reflected today in scheduling of network programs an hour earlier in the Central and Mountain time zones (than on either Coast) because of line costs for separate feeds and presumed early-to-bed habits in the Midwest. As might be expected, rural homes (76 percent) preferred clear-channel stations to regional (21 percent) or local (2 percent) stations, because they represented the only reliable service in many rural areas. The problems of radio coverage were well known to station owners and engineers and the FCC; large areas of the country got no decent service at night, and some lacked reception around the clock. In June 1938 the FCC reported that 8 percent of the population had no reception in daytime and more than 17 percent were without it at night. This neglected segment of more than 20 million people was concentrated in rural areas where 16 percent had no daytime radio and fully one-third had no reception at night. Examination of popularity of network evening programs by basic program type in 1938 revealed other urban-rural differences. Urban listeners had less interest in news—it ranked fifth in urban areas but third in rural areas—perhaps because other means of news communication were more accessible in cities, and because rural families had a stronger need for weather and market information. Urban listeners had more interest in drama—it ranked third in urban areas but fifth in rural areas. All other program types were ranked the

The Radio Receiver Market in the Late 1930s / These two advertisements, from Motorola and RCA, show the variety of radio sets available in the prewar years.

1939 *Motorola* TABLE MODELS

MODEL 59T-1
 Genuine Solid American Walnut Cabinet : 5 Tubes (including ballast tube) : Superheterodyne : 1" Speaker : Top Tuning : Illuminated Dial : Plays on any 110 volt current : Tuning Range 540-1720 kc. Includes 1st Police Band : Compact case : 11 1/4" wide, 7 1/2" high, 6 1/2" deep : Outstanding sensitivity, sharp selectivity and freedom from interference.
Model 59T-1 as above in Ivory Finish

MODEL 59T-2
 Genuine Solid American Walnut Cabinet : 5 Tubes : AC Superheterodyne : 1" Electric Dynamic Speaker : Top Tuning : Illuminated Dial : 3.0 Watts Power Output : Tuning Range 540-1720 kc. Includes 1st Police Band : Compact case : 11 1/4" wide, 7 1/2" high, 6 1/2" deep : Outstanding sensitivity, sharp selectivity and marvellously good tone.
Model 59T-2 as above in Ivory Finish

MODEL 59T-3
 Solid Walnut Cabinet : 5 Tubes (including ballast tube) : Superheterodyne : 1" Speaker : Automatic Top Tuning with 4 Full-Range Push Buttons—each button easily set for any station : Illuminated Dial : Plays on any 110 volt current : Tuning Range 540-1720 kc. Includes 1st Police Band : Heat-Treated Trimmer and Temperature Compensation to overcome drift : 10 1/2" x 6 1/2" x 6 1/2".
Model 59T-3 as above in Ivory Finish

MODEL 59T-4
 Solid Walnut Cabinet : 5 Tubes : AC Superheterodyne : 1" Electric Dynamic Speaker : Automatic Top Tuning with 4 Material Full-Range Push-Buttons—each button easily set for any station : Illuminated Dial : 3.0 Watts Power Output : Tuning Range 540-1720 kc. Includes 1st Police Band : Heat-Treated Trimmer Condensers and Temperature Compensation : 11 1/2" x 7 1/2" x 6 1/2".
Model 59T-4 as above in Ivory Finish

MODEL 59T-5
 Glo-Wood Cabinet : 5 Tubes : 3 Bands—AC Speaker : 6-Button Automatic Full Range Push Button Tuning—each button easily set for any station : Illuminated Dial : Top Tuning : Tuning Range 540-1720 kc. Includes 1st Police Band : 10 and 18 meters short wave programs : 4.5 watts Output : Continuously Variable Dual Tone Control : Size 17" x 9 1/2" x 6 1/2" deep.

BEAUTIFUL STYLING * PERFECT RECEPTION

MODEL 59F-1 PHONOGRAPH - RADIO SOLID MAHOGANY CABINET
 Crystal Pickup : Plays all 16" and 12" records with lid closed : Full strength constant speed motor : 3.0 watts power output : Tone control : Illuminated dial and radio : 5 Tubes : 1" Speaker : AC Superheterodyne : Tuning Range 540-1720 kc. Includes 1st Police Band : Beautiful cabinet of solid mahogany with 4 grille openings for better tone diffusion : Size 17" wide, 10 1/2" deep, 10 1/2" high : Illuminated dial.

MODEL 59K-1 TIME-TUNING
 The Radio that Tunes itself! TIME-TUNING combined with 6-Button "Feather-Touch" Electric Automatic Tuning : continuously variable Dual Tone Control : Push-Pull : 10 watts power output : 5 Tubes : 12" Speaker : Tuning Range 540-1720 kc. Includes 1st Police Band : Heat-Treated Trimmer Condensers and Temperature Compensation to overcome drift : Hand rubbed Walnut finish lowboy cabinet : 21 1/2" x 13 1/2" x 4 1/2" high.

MODEL 59K-3 ELECTRIC TUNING
 6-Button "Feather-Touch" Electric Automatic Tuning : continuously variable Dual Tone Control : 10 watts power output : 5 Tubes : 12" Speaker : Standard and short-wave bands—540-1720 : 2200-7000 : 7000-21,000 kc. : Heat-Treated Trimmer Condensers and Temperature Compensation to overcome drift : Hand rubbed Walnut finish lowboy cabinet : 25 1/2" x 13 1/2" x 4 1/2" high.

MODEL 6A-2 ARM CHAIR RADIO
 6 Tubes : 16" Speaker : Acoustic Amplification and phasing : AC Superheterodyne : Electric Tuning Eye : 3 Bands—540-1720 : 2200-7000 : 7000-21,000 kc. : Illuminated Dial : Individually band-tuned : continuously variable Dual Tone Control : 4.5 watts power output : AVC : complete hand rubbed Walnut finish cabinet, 15 1/2" x 21 1/2" x 22" high.

59K-1 SIX TUBE PUSH-PULL
 6 Tubes : 12" Speaker : 3 Bands—540-1720 : 2200-18,000 kc. : Includes 40, 31, 25, 19 and 10 meters short-wave programs : 6-button full-range manually tuning—each button easily set for any station : continuously variable Dual Tone Control : Push-Pull : 10 watts power output : Heat-Treated Trimmers and Temperature Compensation : Beautiful Walnut finish lowboy cabinet, 20 1/4" x 15" x 30" high.

100K-1 TIME-TUNING
 The Radio that Tunes itself! TIME-TUNING combined with 6-Button "Feather-Touch" Electric Automatic Tuning : Tone-Cover Control : Push-Pull : 14 watts power output : 10 Tubes : 12" Speaker : 3 Bands—540-1720 : 2200-7000 : 7000-21,000 kc. : Heat-Treated Trimmer and Temperature Compensation to overcome drift : special sensitivity control link : Exclusive nested design hand rubbed Walnut finish cabinet : 27" x 13" x 4 1/2".

100K-1 SIX TUBE PUSH-BUTTON Automatic
 6 Tubes : 5 Bands—540-1720 : 2200-18,000 kc. : Includes 40, 31, 25, 19 and 10 meters short-wave programs : 6-button full-range automatic tuning—each button easily set for any station : illuminated straight line dial : continuously variable Dual Tone Control : 4.5 watts power output : Heat-Treated Trimmers and Temperature Compensation : Beautiful Walnut finish lowboy cabinet : 25" x 10 1/2" x 29" h.

AMERICA'S FINEST RADIO * 1939 *Motorola* HOME RADIO *

A MERRY CHRISTMAS



All Year 'Round!

RCA Victor presents a variety of musical gifts that keep on giving... at a variety of prices that make them easy for you to get for family, relatives and friends!

RCA Victor RADIOS



PUSH A BUTTON
That's your Station!

A GRAND GIFT FOR THE FAMILY

A great value, too! Besides its striking new Console Grand Cabinet, this sensational radio offers Electric Tuning, Victrola Button, and a host of other excellent features.

A thrilling Christmas gift that the entire family will enjoy! This beautiful Model 97KG looks and sounds like a lot more than its price. Now only **\$85***

A CHRISTMAS GIFT THAT GIVES ENDLESS HOURS OF PLEASURE!

A masterpiece of beauty—in both cabinet and tone! Model EF-4 is a High Fidelity radio in a stunning 18th Century Cabinet. Brings you all the music that is broadcast—from the very lowest notes to the highest. Offers more than 20 great features including Electric Tuning, Victrola Button, Overseas Dial, Electrical Magic Voice, Magic Brain and Magic Eye. Its price including RCA Victor Master Antenna, is **\$175***



IDEAL GIFT FOR CHILDREN!

A superb radio for children, this Little Nipper Model 9TX1 in Molded Plastic Cabinet, **\$9.95*** walnut finish, tan knobs. Only **\$17.95***



GIVE A "PERSONAL" RADIO! Model 96T2 has improved Electric Tuning, Victrola Button, 2-Band Straight-Line Dial, RCA Victor Metal Tubes. American **\$39.95*** and Foreign reception Only **\$49.95***



RCA Victrolas



GIVE A GIFT OF ALL MUSIC!

Here is the complete musical instrument—a gift that will give countless hours of enjoyment. RCA Victrola Model U-125 has such outstanding phonograph features as an Automatic Record Changer for 10" and 12" records, Crystal Pick-up and Tap-Load-Tuning and many other great features. Special 40th Anniversary price, with your old radio, only **\$135.00***

Price will be \$175.00 January 1st.

FOR THE COLLEGE STUDENT!

Boys and girls at college will appreciate this RCA Victrola Model U-104 in the lowest priced electric RCA Victrola in history! Has crystal Pick-up, True Tracking Tone Arm, Tone Control for both radio and phonograph. **\$19.95***



MORE THAN 6,500 CHRISTMAS SUGGESTIONS

In the Victor Record Catalog you will find a wealth of gift ideas. Most complete, compact and convenient musical reference work... lists wide variety of Victor Records COMPLETE with bibliographies, portraits, pronunciation tables, etc.



*F.O.B. Camden, N. J., subject to change without notice. Listen to the "Magic Key" Sundays, 2 to 3 P.M., E. S. T. on the NBC Blue Network.

VICTOR and BLUEBIRD RECORDS

A \$25.95 GIFT FOR \$14.95

The Victor Record Society Offer makes a wonderful Christmas gift. It's a \$25.95 value. Includes the \$14.95 (list price) RCA Victrola Attachment, \$9 worth of Victor or Bluebird Records, a \$2 subscription to the Victor Record Review and membership in the Victor Record Society—all at the amazingly low **\$14.95*** price.



A FEW FAVORITE CHRISTMAS VICTOR RECORDS

26049, 26050, 26051—A collection of the six most popular Christmas hymns. Album No. P-2 . . . **\$2.25**
6607—Adeste Fideles—The Palmers . . . McCormack . . . **\$1.00**

1748—Der Tannenbaum—Silent Night, Holy Night, Haida Laskankko—Paul Brenner . . . **\$1.50**
25145—Santa Claus Is Comin' to Town—Jingle Bells, Dursley—Goodman . . . **75¢**

ONLY RCA VICTOR OFFERS RCA VICTOR METAL TUBES

Prove truth in producing a radio with complete harmony—RCA Victor Metal Tubes. Made for RCA Victor Radios, they also improve the performance of any make of radio.



RCA Victor

RCA MANUFACTURING CO., INC., CAMDEN, N. J.

A Service of the Radio Corporation of America

same: amateur (1), variety (2), serial drama (4), dance band music (6) and classical music (7).

Early research into listening habits found that, as income and education went up, the amount of radio listening (and later television watching) went down. Advertisers and networks applied the concept of *audience flow*, which describes a program's ability not only to attract an audience but to increase the audience for the shows before and after it. This led stations and networks to schedule *blocks* of compatible programs—such as one serial drama following another all afternoon—so as to build ever larger audiences throughout the evening.

5•73 *Increased Research*

In the late 1930s and early 1940s, there were two competing broadcast rating organizations. The Cooperative Analysis of Broadcasting (CAB, see 4.72), based in 33 cities, 14 on the East Coast, was a non-profit organization run by advertisers and advertising agencies for the benefit of radio time buyers. Using a modified recall telephone interview system, CAB called numbers at random from a sample four times a day and asked the respondents what they had heard on the radio during the previous two or three hours. Ratings, processed and published every other week, were based on a total of 3,000 calls a day nationwide. Any single program's rating was based on at least 1,500 calls over the two-week period.

In the fall of 1934, Clark-Hooper, Inc., began to sell advertisers audience research on magazines and radio. The radio portion split off in 1938, becoming C. E. Hooper, Inc., which provided monthly ratings of network-sponsored, not sustaining, programs. Hooper pioneered national

use of the coincidental telephone method—which avoided the limitations of the listener's memory by asking what he or she was listening to *at that moment*. However, the coincidental technique required nearly ten times as many calls as the recall method in order to report data at 15-minute intervals. Both techniques suffered from the difficulties of telephoning in sparsely settled areas and discounting the radio homes without telephones.

Radio rating service reports were prepared both for broadcast time buyers (advertisers and their agencies) and sellers (networks and stations). Although they were expensive, particularly for the sellers, they soon gained a reputation for detail and accuracy. Both firms—Hooper and CAB, whose service was called the "Crossley rating" after Archibald M. Crossley, its founder—reported ratings or percentages of radio receivers tuned to a given station, network, or program in relation to total receivers whether in use or not. This raw quantitative data satisfied most advertisers until CAB started to supply qualitative information by breaking down program rating data by income groups and geographic areas—an innovation of great value to alert advertisers. As an index to listening behavior in a small sample of homes, marketing research company A.C. Nielsen was developing, but did not commercially introduce until 1942, an automatic "Audimeter" that recorded whether a set was on and to which channel it was tuned. More reliable and to some extent more valid for measuring *tuning* if not *listening* behavior than the telephone techniques, this device was also expensive and dependent on the audience member's returning the data. This technique became much more important for television than for radio research (see 6.72).

In addition to the ratings, which merely gave size-of-audience estimates, the

first serious research analyses of radio's effect on its audience began to appear. In 1934 Frederick Lumley's *Measurement in Radio* supplied detailed information on the use of audience research. The size of his bibliography suggests that advertiser pressure had made management look seriously at the size and particulars of their prime and only "product"—their audience. In 1935 the first report of in-depth audience research, Hadley Cantril and Gordon W. Allport's *The Psychology of Radio*, examined the mental setting of radio—how listeners perceived music and speakers—and potential uses of this experimentally derived data. The first extensive study of a program, Cantril's 1940 *The Invasion from Mars: A Study in the Psychology of Panic*, which investigated listener reaction to Orson Welles's famous 1938 program (see 5.62), still is considered basic to the study of group panic and the mass media.

Founded late in 1937 by a Rockefeller Foundation grant to Princeton University, the Office of Radio Research was established there with Paul F. Lazarsfeld as director. He was assisted by two young researchers, Frank Stanton, who had worked in audience studies at CBS since 1935, and Hadley Cantril. The organization's first major publication was H. M. Beville's *Social Stratification of the Radio Audience* (1939), which is the earliest detailed description of audience ratings and the fruits of their first eight or nine years. Beville later became head of research for NBC, and Stanton started a three-decade tenure as president of CBS in 1946. In 1940 the Office of Radio Research moved to Columbia University in New York and issued its first commercial publication, Lazarsfeld's *Radio and the Printed Page*, a report on several studies comparing newspapers and radio. A year later it published the first of an intended annual series, Lazarsfeld and Stanton's *Radio Research 1941*,

which contained reports on research into radio music, radio in rural life, foreign language broadcasting, and use of radio and the press by young people. Only two other volumes, 1942–1943 and 1948–1949, followed in this series. Lazarsfeld and Stanton also developed the *program analyzer*, still in use at CBS and elsewhere, to obtain minute-by-minute reactions of a test audience to new programs.

The output of the Columbia-based project, which lasted well past the war years, is perhaps the clearest indication of academic concern for and interest in radio's influence. Other colleges and universities mounted similar but smaller projects, focusing mostly on audience effects but also on programming control and regulation. By 1939 at least 28 doctoral dissertations and 159 masters theses that dealt with broadcasting had been completed.

5•8 Formative Years of the FCC

Major changes in federal regulatory structure and approach after 1933 were built on the precedents of the Federal Radio Commission. Several problems had hindered the governmental role in electrical communications: regulation of closely related means of electrical communication was spread among various agencies, which frequently had little to do with one another. The Interstate Commerce Commission (ICC) controlled interstate telegraph and telephone traffic as little as possible; the FRC controlled most aspects of radio, including broadcasting; and the Department of Commerce had some regulatory voice in the wire and wireless common carrier industries. Members of Congress had attempted over the years to amend the Radio Act of 1927 to make the FRC a permanent administrative agency, since it

had not been able to become the part-time adjudicatory body envisioned by the 1927 act. Because President Hoover did not favor these bills, they were killed by pocket veto.

5•81 *Creation of the FCC*

Soon after becoming President, Franklin D. Roosevelt appointed an interdepartmental committee on communications to examine the role of the nine governmental agencies involved with public, private, and governmental use of radio. In December 1933, this committee recommended creation of a Federal Communications Commission that would contain nearly all these functions, serving as an enlarged version of the FRC and regulating interstate telegraph and telephone as well. In February 1934, bills were introduced into Congress to establish such a commission, the "services affected to be all of those which rely on wires, cables, or radio as a means of transmission." The President specifically called for broad and non-restrictive legislation so that the new organization would have utmost flexibility. Representative, later Speaker, Sam Rayburn (D-Texas) introduced the House bill, which would replace the FRC with the FCC and modify the Radio Act of 1927 without abolishing it. Senator Clarence C. Dill (D-Washington) sponsored the Senate bill. It would replace the 1927 act and combine the duties of the different agencies in the new FCC, with rigidly defined radio and telegraph divisions, but would add more power to the new agency. FRC members generally backed the proposed changes, while the broadcasting industry, with the National Association of Broadcasters acting as spokesman, opposed them because the NAB feared any stronger governmental role in radio broadcasting. Both houses passed their bills, and the Presi-

dent signed a Senate-House compromise bill to go into effect July 1, 1934.

The Communications Act of 1934 incorporated in its Title III most of the provisions of the Radio Act of 1927, retaining the three-year broadcast license term, although the FRC was then restricting licenses to six months and the Senate had toyed with a one-year period. Title I set up the new commission with seven commissioners—two more than the old FRC—appointed to staggered terms of seven years each, providing that no more than four members could have the same political affiliation. Charged with designating internal operations and divisions, the commissioners initially established broadcast, telegraph, and telephone divisions but abolished them late in 1937. From then on they acted as a committee of the whole, occasionally appointing *ad hoc* subgroups to prepare investigative reports into specific subjects. Commissioners were to be nominated, and the chairman appointed, by the U. S. President, with the advice and consent of the Senate, and could not have a financial interest in the industry. The commission was to report annually to Congress. Title II dealt with common carriers and generally followed existing ICC regulations. Title IV was concerned with procedural and administrative matters, Title V with penal provisions and forfeitures, and Title VI with miscellaneous matters including the presidential emergency power to take over electrical and electronic communications in time of war or other emergency.

Most of the men appointed to the FCC in the 1930s were lawyers with public utility experience or governmental service. Although one engineer usually served on the commission, the need for technical expertise was less now that basic interference-reducing decisions had been made by the FRC and upheld by the courts.

5•82 *Program Cleanup*

The first FCC regulatory project was a concern of the old FRC—changing substandard program and advertising policies in broadcasting. Although the act forbade the FCC to censor, it could decide whether a station's policies and programs were in the public interest. This concern was apparent in a variety of hearings in the thirties: on renewal of a 1935 Missouri station for carrying broadcasts by an astrologer (this was frowned on by the FCC not only because such individual messages were not broadcasting but because they took advantage of listeners' credulity); on a New York licensee for showing poor taste in accepting contraceptive advertising; on New Jersey and New York stations for broadcasting horse race information, using a code that only subscribers to a certain racing newspaper could decipher (held to be unfair, since the broadcast excluded some listeners); on a New York station for relinquishing responsibility as well as authority when it sold blocks of time for others to program; on several stations for promoting fraudulent products, especially patent medicines; and on several southern and western stations for airing misleading personal advice programs. Perhaps the most publicized case involved an episode of the popular Chase and Sanborn-sponsored *Edgar Bergen and Charlie McCarthy Show* in December 1937, in which guest star Mae West added some racy inflections in an "Adam and Eve" sketch. Many listeners were offended, and the FCC was inundated with complaints. Other than reprimanding NBC and its affiliated stations, the commission took no action.

In very few cases did stations actually lose licenses or fail to get a renewal or a construction permit. In fact, only two licenses were revoked and eight weren't renewed between 1934 and 1941. But FCC

"raised eyebrow" displeasure was sufficient to change operating policy at an offending station. In a 1939 memo, the FCC listed 14 kinds of program material or practices deemed not to be in the public interest: (1) defamation, (2) racial or religious intolerance, (3) fortune-telling or similar programs, (4) favorable reference to hard liquor, (5) obscenity, (6) programs depicting torture, (7) excessive suspense on children's programs, (8) excessive playing of recorded music to fill air time, (9) obvious solicitation of funds, (10) lengthy and frequent advertisements, (11) interruption of "artistic programs" by advertising, (12) false or fraudulent or otherwise misleading advertising, (13) presentation of only one side of a controversial issue—an early statement of the Fairness Doctrine (see 9.82), and (14) refusal to give equal treatment to both sides in a controversial discussion. The commission still considers all but the last five to be poor programming practice at all times, and it even questions some of the last five under some circumstances.

The Federal Trade Commission took over the major portion of advertising regulation, thanks to the Wheeler-Lea Act of early 1938. This act amended the FTC's original mandate to allow it to seek out and stop unfair and deceptive advertising in any medium, specifically for drugs, cosmetics, foods, means of product distribution, and marketing practices.

5•83 *Investigations of Monopoly*

The FCC also looked at monopoly practice in several communications industries. Under the strong guidance of Commissioner Paul Walker, it undertook a massive investigation of American Telephone and Telegraph's rate structure between 1936 and 1939, resulting in a limited

rate reduction. Congress added pressure to this investigation and also, questioning FCC apparent unconcern about monopoly control of radio, considered several bills calling for FCC examination of the entire industry.

Under this pressure from its funding source, in March 1938 the FCC issued Order No. 37, an inquiry into "all phases of chain broadcasting and into the broadcasting industry generally" to see whether rules were needed to control network tendencies to monopoly. From November 1938 through May 1939, a subcommittee of four commissioners heard 73 days of testimony from 94 witnesses, resulting in thousands of pages of testimony and hundreds of exhibits on all aspects of network operation

and its effect on the broadcasting industry. On June 12, 1940, the subcommittee issued a tentative, 1,300-page, mimeographed report of summarized testimony and recommended rule changes. Following hearing on these findings, the full commission on May 2, 1941, released its *Report on Chain Broadcasting*, containing specific regulations "designed to eliminate the abuses uncovered."

Of these regulations, the following were most important: (1) network affiliation contracts would be limited to a single year for both parties—previously, stations had been bound to networks for five years, but the networks were bound for only one year; (2) affiliations could no longer be exclusive—an affiliate could use programs

One Network Reacts to the Chain Broadcasting Report: 1941 / Seldom had the broadcast industry been as aroused as when the FCC issued its Chain Broadcasting Report and new rules in spring 1941. Here are some of the reactions to the report, which, although it survived a Supreme Court test (see 6.85), did not have the dire effects the broadcasters anticipated.

Columbia Broadcasting System here states . . . that, instead of benefiting the public, instead of promoting sound competition, instead of improving radio broadcasting, what the Commission proposes to do will have these effects: (1) It will threaten the very existence of present network broadcasting service, bring confusion to radio listeners, to radio stations, and to the users of radio [advertisers], and deprive business of an orderly and stable method of presenting sponsored programs to the public. (2) It will threaten the continuance to radio listeners of their favorite sustaining programs sent out by the networks, such as . . . symphony broadcasts, educational and religious programs, world news service. We do not see how, under these "regulations," Columbia or anyone else can afford to, or has any real inducement to, produce and improve the character of its

public service. (3) It will establish radio monopolies in many sections of the country. . . . (4) In weakening the ability of the radio industry to give the kind of broadcasting service that people have come to demand, it may, in the end, encourage the government to take over broadcasting altogether. Meantime it opens the door to the complete domination of radio by whatever government happens to be in power. (5) It will cripple, if it does not paralyze, broadcasting as a national service at a time when radio should be encouraged to continue and enlarge its contribution to national unity and morale.

(NBC reacted as strongly. See Appendix C, tables 2 and 4, to see how "badly" radio was "harmed," how the networks "all but disappeared," and how radio profits "plunged.")

Source: "What the New Radio Rules Mean" (New York: CBS, May 1941) page 4.

from other networks or sources; (3) networks could no longer demand options on large amounts of station time, since the FCC believed that stations—that is, licensees—should be in charge of and responsible for their own program content and arrangement; (4) an affiliate could reject any network program which in its view did not meet the public interest, convenience, or necessity, and could not sign away that right in its affiliation contract; (5) networks would have no control over a station's rates for other than network programs; and (6) "no license shall be issued to a standard broadcast [AM] station affiliated with a network organization which maintains more than one network" except where such networks operated at different times or covered substantially different territory. These rules, and a seventh rule (not part of the chain broadcasting regulations) prohibiting duopoly, or the owning of two stations in the same service area by one licensee, would drastically affect the industry.

Immediate network reaction was generally sharply antagonistic. CBS and NBC both published booklets claiming that the proposed rules could destroy the American system of broadcasting. NBC stood to lose the most, as the sixth rule would force it to drop either the Red or the Blue chain, and the seventh would force it to sell one of the two stations it owned in New York, Chicago, Washington, and San Francisco—one affiliated with the Red and the other with the Blue network. Only Mutual applauded the new rules and had supported them in the hearings in the belief that they would make it more competitive with the other networks.

In October 1941, NBC and CBS brought suit in the Federal District Court in New York to set aside the regulations; Mutual entered the case on the other side. The FCC had twice postponed implemen-

tation of the new rules and now postponed them again. As the country entered World War II, the network rules were one of the hottest topics in the broadcasting industry. The commission, many local broadcasters, and many critics of broadcasting in Congress contended that by removing their dependence on network fare, the new rules would enable stations to develop better programming. (Two decades later, program syndicators also employed this reasoning in an effort to get FCC backing for more local television programming in prime time theretofore considered "network" time—see 9.3). The networks and their defenders claimed that the rules would weaken network operating flexibility and lower the quality of network programs.

The commission also began to move on the issue of co-ownership of newspapers and broadcast stations in the same market. In spite of congressional hearings and some FCC action by 1936, the proportion of newspaper-owned stations increased through the decade, until by 1940 more than 30 percent were in this category, many located in the same market as their owners. The FCC finally took action early in 1941, aware perhaps that the Democratic administration would be concerned about Republican newspapers' controlling *all* news media and certainly that nearly one-quarter of the FM construction permits had gone to newspaper-connected applicants. FCC Chairman James Lawrence Fly announced in March 1941 FCC Order No. 79, which called for . . . an immediate investigation to determine what statement of policy or rules, if any, should be issued concerning applications for high frequency [stations] with which are associated persons also associated with the publication of one or more newspapers. . . ." While press ownership of AM stations also would be examined, issuance of con-

struction permits to newspaper-controlled FM stations was frozen for the duration of the hearings, which lasted from July through October 1941 and then recessed. There was dissension within the industry and even within the FCC over the hearings. Two commissioners thought that the FCC was overstepping its authority and the First Amendment by in any way considering the newspaper business. Station owners claimed that anyone or any group should be allowed to own radio stations, and that newspapers were no exception. Critics of co-ownership argued that to have both media under single control could limit expression of different viewpoints and might encourage combined advertising practices that would squelch the establishment of new stations or newspapers in such a market (see 6.85).

5•84 *Self-Regulation*

The story of industry self-control in the late 1930s essentially is a review of the reorganization of the National Association of Broadcasters, the revision of its radio code, and the long fight with ASCAP over music rights (see 5.85). While the period left broadcasters with a stronger trade organization and more unified clout, fundamental problems obviously remained unsolved.

Members of the NAB had begun to realize its limitations, as battles with unions, music copyright organizations, Congress, and private groups came and went with little broadcaster input or impact. Until 1938 the association, operating on \$80,000 a year, with a salaried managing director and an unpaid broadcaster as ceremonial president, lacked personnel and funds to function effectively as a trade and lobby group. Representation of broadcaster interests had to come mostly from

the networks and larger stations and reflected their views. Realizing the need to centralize, coordinate, and concert its efforts in the face of government investigations and other problems, the 1938 NAB convention voted to increase the budget threefold, to support a paid president and staff with dues proportional to a member station's earning, and to form operating subdivisions focusing on law, labor questions, management problems, engineering issues, and the role of education on the air. In this way, it was hoped that NAB—and therefore most broadcasters—would keep up to date on issues, and the broadcasting industry's position on issues, and communicate unified views to Congress and the FCC.

Under the National Recovery Administration (NRA) ruling of 1933, the broadcasting industry's 1929 code became law for all stations including earlier non-subscribers. When the Supreme Court declared the NRA unconstitutional in 1935, the mandatory code went by the boards. Because of the antibroadcasting industry sentiment at the 1934 Communications Act hearings, the NAB hastily assembled a ten-point, unenforceable ethical code in 1935. After the NAB reorganization of 1938 and during the FCC investigation of chain broadcasting, the NAB implemented in July 1939 a greatly expanded and revised radio code—a later edition of which is still in use. The new code allowed only six to ten minutes of commercials per evening hour, with a bit more during the day. It permitted no separate scheduling of controversial issues; they were to be covered in news and special programs for the expression of opinions. It dealt with other issues in generalities and platitudes that had little effect on existing practices. Advertising agencies had helped to assure flexibility in the code, and a Code Compliance Committee su-

pervised implementation. One effect of the code was a reduction of Father Coughlin's access to the air after code-subscribing stations learned that they would have to provide opportunity for other points of view. Many stations also deemed news of labor unions controversial. In practice, the requirements for controversial issues or fund-raising appeals served to limit access to radio drastically for all but commercial advertisers. Backers of the code claimed that selling time for controversial issues would overload the air with fractious arguments that would bore the listener seeking relaxation and entertainment. Critics of the code agreed that controversy might annoy some listeners and most certainly would not appeal to advertisers but argued that it was a necessary aspect of public interest broadcasting—an anticipation of the Fairness Doctrine. Despite these differences, broadcasters widely publicized the code as a symbol of their acceptance of responsibility to serve public needs.

5•85 *The Music Licensing Battle*

In the meantime, the original nemesis of NAB was flexing its muscles again. The American Society of Composers, Authors and Publishers (ASCAP), whose demands had led to formation of the NAB (see 3.83), had collected more than \$800,000 (40 percent of its income) from radio music performance fees in 1930, \$2.7 million in 1937 (60 percent), and \$4.15 million (about two-thirds) in 1939. Many ASCAP members approved of such fees because they thought that radio was helping to kill the sheet-music and record businesses.

In 1937 ASCAP went too far—in the broadcasters' eyes—and announced an increase of 70 percent or more in its license

rates. This demand forced broadcasters late in 1939 to create a fund to establish a temporary music licensing agency to compete with ASCAP: Broadcast Music, Incorporated (BMI). The \$1.5 million fund was about half what stations had paid ASCAP in 1937, but BMI used it to advantage and immediately set out to build an alternative library of music. When ASCAP increased its rates again in 1940, broadcasters decided to make BMI permanent and not to renew ASCAP contracts ending that year.

For ten months beginning January 1, 1941, listeners heard BMI's few selections and a good deal of public domain music—music on which copyright had expired. Stephen Foster's "Jeannie with the Light Brown Hair" found sudden new popularity, and programs had new theme music. Although the networks and many stations stuck to their guns, some broadcasters chose to pay for ASCAP licenses rather than face checking each tune used or risk paying a fine of \$250 for each performance of music without a license. The battle became more confusing early in 1941 when the Justice Department filed anti-trust suits against not only ASCAP but the networks as principal backers of BMI. Some musicians and publishers switched from ASCAP to BMI and vice versa, but ASCAP music still was not played over most stations. In May 1941 Mutual defected and signed with ASCAP, and in October the industry and ASCAP compromised on payments much closer to the old rates than to the new demands. The standoff had cost ASCAP some \$4 million in revenue, the need to operate under a consent decree signed with the Justice Department, and the permanent addition of BMI as a competitor. But by late October and early November, ASCAP music again was playing on networks and local stations, under new contracts which would last until 1950.

5•9 Radio's Role Here and Abroad

As a medium of entertainment and news, radio really came into its own both here and abroad during the late 1930s. Radio was not only accepted and enjoyed—it had rapidly become an essential element of government and business as well.

5•91 Here . . .

By the time the United States entered World War II in December 1941, radio had become a part of American life. Three events showed its impact clearly: the 1938 Orson Welles "War of the Worlds" broadcast, which created panic because listeners had learned to believe what they heard on radio (see 5.62); the ASCAP hassle, which limited popular music in early 1941 at the height of the big band craze (see 5.85); and the FCC investigation of the networks (see 5.83), by which the 10-year-old networks were shown to have attained the importance of much older businesses.

Politically, radio brought the government home to the average American, who hung onto President Roosevelt's words during the first 100 days of the New Deal, in the heart of the Depression. More people heard more candidates and political opinions than had been heard throughout the country's history. Some commentators claimed that radio caused the 87 percent increase in votes cast in national presidential elections from 1920 to 1940, while the population grew only by 25 percent.

Furthermore, by its coverage of domestic and international news events, radio became the news medium to which people turned first, replacing the century-old dominance of the newspaper.

Radio's increasing importance to the listener can be indexed in other ways: newspaper attempts to build or buy AM and FM stations as a hedge against the future; the use of motion picture stars and stories to promote films, as on *Lux Radio Theater*; the inclusion of radio-related questions on national polls and surveys, including the 1940 census; increased use of radio by public office seekers or, like Huey Long and Father Coughlin, opinion molders; ASCAP's reliance on revenue from radio above that from records, sheet music, or nightclub performance; the increase in car radios; and refinement of radio audience research, primarily to serve hard-nosed advertisers.

Another indication of radio's impact was the sharp rise in criticism of its programs and organization. Books, pamphlets, and articles charged that big business interests had taken over radio, particularly the networks, to the detriment of the average listener. Special interest groups bemoaned the lack of religious programming, the paucity of educational programs, the increasing flood of advertisements. Many critics believed that radio's chief problems were no longer technical, as they had been through the mid-1930s, but social, and that programming aimed at the lowest common denominator would make radio a societal liability.

In the late 1930s, Americans were both struggling up from the Depression and preparing against a war that by 1941 seemed inevitable. Radio broadcasting prospered accordingly: its increasing popularity filled a major marketing function when other media were suffering from lower revenues; it provided news and other information to the public; and it filled pleasurably the leisure hours that the Depression and then the shorter work week provided. Radio also prepared itself for service in the war that was to come.

5•92 . . . and Abroad

Radio broadcasting also was developing in Canada, Mexico, and Cuba. As the stations in these neighboring nations multiplied, they used greater power, spent longer hours on the air, and consequently produced greater interference. Both Canada and Mexico complained that the United States was hogging most of North America's clear channels and was ignoring their needs. This dissension led to a meeting early in 1937 to plan a fair division of the broadcast spectrum among the four countries, and a November 1937 conference in Havana, where representatives of the United States, Canada, Mexico, Cuba, Haiti, and the Dominican Republic drew up a North American Regional Broadcasting Agreement (NARBA). After ratification by the various legislatures, NARBA went into effect in late March 1941. This agreement forced many stations to change frequency in this country, Mexico, and Canada. In the United States, the FCC's moving 777 of the 862 stations on the air—only one to four channels for most of them—caused a minor technical expense rather than a major audience loss. About 100 Canadian stations were changed, and Mexico closed down many border stations that had long broadcast to the United States immune from FCC controls. In the end, Mexico and Canada gained better frequency allocations, and interference for all six countries was substantially reduced.

The story of radio abroad in the years 1934–1941 is essentially one of "haves" and "have-nots." While this country had fully half the world's radios, one for every 3.5 people, and Europe had one radio for every eight people, vast areas had little or no radio service or facilities. For example, rapidly industrializing Japan had but one receiver for every 28 people.

Mexico, importing most sets from the United States, had only one radio for every 64 persons, concentrated in major cities.

Patterns of control and organization were evident overseas. In most European countries, government controlled radio, sometimes indirectly, usually with annual license fees on receivers for support. Under Hitler, radio became a part of the German Propaganda Ministry. In the United Kingdom, the British Broadcasting Corporation was a government-chartered monopoly, a kind of public utility, supported by license revenue. Director-general until 1938 was the strong-minded Sir John Reith, who during his 15-year tenure put a philosophical stamp of "public service" on both commercial and noncommercial British broadcasting that has lasted to this day. Since broadcasting in the many colonies of European nations copied the mother country's, the majority of African and Asian systems—where radio existed at all—had central government control of facilities, finances, and programming. Countries of the Western Hemisphere, except for Canada and some of the West Indies and Latin America, tended to follow the commercially based system of the United States.

The use of shortwave for international broadcasting increased sharply during the 1930s as world tension rose. In this hemisphere, both commercial—primarily CBS and NBC—and governmental transmitters beamed broadcasts to Latin America by shortwave for rebroadcast over either medium- or shortwave domestic stations. By 1935 the Soviet Union, Germany, Italy, and Great Britain were sending out regular shortwave broadcasts to North America and the rest of the world, in appropriate languages. Since many floor-model console radios and some table radios sold here were equipped for shortwave listening, Americans frequently listened to short-

wave in a time of crisis in Europe. Although much European shortwave propaganda was intended for other European nations—Germany, in particular, used radio to soften up enemy resolve before starting a diplomatic or military move—even after World War II began, some was directed at other parts of the world.

5•93 *Period Overview*

In these years prior to our entry into World War II, there were few departures from the trends established in the 1926–1933 period. Major technological changes were brewing for FM in the Armstrong laboratory and for television in the RCA and Farnsworth laboratories. While these new media already were competing for spectrum space, attention, and backing, only in the last months before Pearl Harbor would the public become aware of them. Their real impact would come after the war. After the initial shocks of FRC regulation and the Depression, broadcasting stations increased in number and power, and brought many communities their first local service. Radio carried news of political and economic changes and also took people's minds off their troubles.

Radio's winners and losers were easily identified in this period: networks and their supporting advertisers, influenced by the increasingly powerful advertising agencies, determined program content. What the networks presented, local stations carried, and copied in local programming. Commercial support, determined largely by audience ratings, was the substance of program and station survival. Many young entertainers began long careers on radio, and later on television. On the other hand, educational radio languished almost into nonexistence. Until Americans acknowledged the worldwide

threat of events in Europe, news and public affairs were limited in both national and local programming. Once war came, however, such previously unknown reporters as Edward R. Murrow became household names through their coverage of radio's first war.

Other than program domination by networks and advertising agencies, the most important development of the late 1930s was the growth of federal regulation. The FCC, established in 1934, completed the major technical receiver-interference reduction started by the FRC and turned to program content and media economics—areas that would demand increasing attention. Questionable program practices were brought to light and eliminated. Broadcast ownership and control, particularly as affected by the networks, was the subject of serious studies, numerous FCC hearings, and decisions. The general public neither knew nor cared about the behind-the-scenes battles—with the exception of the ASCAP-broadcasters fight that removed popular music from the air for several months.

Radio as an increasing force in tying the nation together was illustrated in the first significant academic research into broadcasting. Radio's potential as both a positive and a negative propagandistic tool emerged in its early coverage of both the New Deal and the war in Europe. But the most important test for American radio was yet to come.

Further Reading

The blossoming of radio's impact is clearly seen in the great increase in number of books and other literature about radio in this period, making the following list much more selective than that for earlier chapters. Again, a good impression of

radio's social role is found in Barnouw (1968), while a contemporary view with that ever present RCA bias is in Archer (1939). Excellent readings on the period, many from the *Journal of Broadcasting*, are in Lichty and Topping (1975). Analysis of the industry, with a focus on the increasing importance of networks, is the subject of Robinson (1943) and the *FCC Report on Chain Broadcasting* (1941), one of the most important FCC documents on radio. The

industry view of these issues is found in Sarnoff (1939). The first practical guides to network-dominated radio advertising are Hettinger and Neff (1938) and Dygert (1939), while Eoyang (1936) examines industry economics in a broader context, with a wealth of data not readily found elsewhere. The steady decline of educational radio is detailed in Atkinson (1941-1943), Frost (1937a and b), and Cooper (1942), a very useful annotated bibliography.

Key Broadcasting Indicators: 1935 and 1940 / This is the third of ten tables offering comparable selected information for a 50-year period (to 1975) at five-year intervals. Sources for items 1-6 and 11 are the tables in Appendix C, while other information comes from sources indicated in the notes below. Most data are for January 1.

Indicators	AM Station Data	
	1935	1940
1. Number of commercial stations	543	ca. 730
2. Number of noncommercial stations	42	ca. 35
3. Total stations on the air	585	765
4. Number of network-affiliated stations	188	454
5. Percentage of commercial stations affiliated with networks	32%	59%
6. Total industry income (add 000,000)	\$113	\$216
7. One-hour station rate (New York)	\$950	\$1,200
8. One-minute station rate (New York)	na	na
9. One-hour network rate, evening	\$14,250	\$18,500
10. Number of broadcasting employees	14,600	25,700
11. Percentage of families with sets	67%	81%
12. Broadcasting regulatory budget (FCC)	\$1,125,599	\$1,838,175
13. Total FCC personnel	442	625

Notes (see Appendix D for full citations)

na = not available or not applicable

7. Station is WEAf, flagship of NBC-Red.

9. Network is NBC-Red with 68 stations in 1935 and 121 in 1940 (full network service).

10. Lichty and Topping (1975), table 23, page 290.

12. and 13. FCC Annual Reports, data for fiscal years 1935 and 1940.

For network programming, the standard source is Summers (1958), which is best supplemented with the program descriptions and data found in Buxton and Owen (1972) and the descriptive encyclopedia by Dunning (1976). The two short books by Harmon (1967 and 1970) provide a nostalgic feeling for radio's golden age. Stedman (1971) offers a fine discussion of radio serials and their relationship to movie serials and television programming, while Settel's pictorial volume (1967) gives a good overview of content on network radio with pictures and program excerpts. Radio news operations are seen in Culbert's fine analysis of radio news in the late 1930s (1976), Schechter and Anthony's discussion of NBC operations (1941), and the wartime work of reporters Shirer (1941) and Murrow (1941). The varied roles of Father Coughlin are discussed in Marcus (1973). The first book-length study of the esthetics of radio is Arnheim (1936). Audience studies, aside from those mentioned in the text, include Connah (1938), which reviews audience information of importance to advertisers.

Other than the network regulation items already noted, the best sources on the increasing government role in broadcasting are Rose (1940), probably the best single book on the issues of public policy in the pretelevision broadcasting industry; Frost (1937b); Herring and Gross (1936); Edelman's 1950 history of FRC and FCC administration of broadcast licensing; and the annual reports of the FCC, beginning in 1935. An historically detailed study of broadcasting law is found in the two volumes of Socolow (1939). An excellent FCC study of economic and political regulatory decision making is the *Report on Social and Economic Data* (1938).

The beginnings of FM broadcasting are found in Lessing (1956) and Erickson (1973), both of which, especially the

latter, are overemotional and biased toward Armstrong. The development of electronic television is detailed in Eckhardt (1936) and Everson (1949), both stressing the work of Farnsworth; Hubbell (1942), a popularized history; and Waldrop and Borkin (1938), which studies the economic empire-building behind the laboratory development of television. Maclaurin (1949) analyzes the patent situation and television's innovation, and Abramson (1955) offers a solid technical discussion of television developments. A compendium of engineering, descriptive, and comparative papers on the finally approved NTSC television system is found in Fink (1943).

British developments in television are best seen in Swift (1950) and Pawley's fine technical history (1972). Other analyses of broadcasting overseas can be found in Briggs (1965) for the golden age of the BBC under Sir John Reith, Huth (1937) for a French-language detailed country-by-country discussion of radio's status at that time, and Childs and Whitton (1942), which discusses the international radio propaganda effort in the early years of World War II and before.

Radio Goes
to War
(1941–1945)



"Seems like free men have done it again!"—On a Note of Triumph, Norman Corwin, 1945



**Radio Goes
to War
(1941-1945)**



"... radio has nothing but a front page."—Elmer Davis, 1942

The tension between the United States and Japan had been building weekly. While members of the America First Committee and others thundered against participating in a foreign war, the U.S. government was selling arms to the Allies in Europe, the navy had orders to shoot back if fired upon, and the army was priming itself with the draft and extensive maneuvers in Louisiana. Overseas, Hitler neared Moscow after his midsummer invasion of Russia; and General Douglas MacArthur, an American officer technically working for the government of the Philippines, said that he had what it took to resist Japanese invasion of "up to five million men." At home, war-related industries were humming as the

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country geared for the war that seemed to be coming.

December 7, 1941, was a Sunday, and across the country people were wading through the newspaper, going for a day's outing or Christmas window shopping, or just relaxing. In Washington, Secretary of State Cordell Hull expected two Japanese emissaries in the latest of many attempts to reduce the danger of war between the two countries.

Radio in those years devoted Sunday afternoon largely to public affairs and classical music. Audiences were not large, but they were loyal—and such programming was thought probably to please the FCC. At 2:30 P.M., eastern standard time, NBC-Red was about to broadcast a *University of Chicago Roundtable* program while NBC-Blue was in the middle of a Foreign Policy Association talk. A labor talk sponsored by the CIO had just finished on CBS, and the weekly New York Philharmonic broadcast would begin at 3 P.M. Listeners tuned in for the interim program were startled to hear newsman John Daly cut in at 2:31 with “The Japanese have attacked Pearl Harbor, Hawaii, by air, President Roosevelt has just announced. The attack was also made on naval and military activities on the principal island of Oahu.” In his haste, Daly stumbled on the pronunciation of Oahu before repeating the incredible announcement. The other networks soon delivered similar bulletins, and Americans began to realize that war had come. For an hour or so, bulletins broke into regular programming, adding new details as military or Hawaiian authorities released them.

As afternoon wore on to evening on the East Coast, military censorship clamped down, leaving radio with limited information and unlimited demand for news. Hence, more and more analysis and commentary—much of it badly in-

formed—filled networks' programming that Sunday evening. Military personnel were ordered, by radio, to report for duty in uniform immediately—including headquarters officers and technical personnel who had not worn uniforms for years. Stations and networks tossed aside program schedules, canceling some shows and delaying others to make room for news bulletins. Even commercials gave way to news.

On the West Coast, people were worried about possible air raids or naval bombardment of major cities or southern California airfields. Some anti-aircraft guns were fired at nonexistent enemy airplanes. The federal government took emergency measures. Because enemy ships or planes could make use of radio broadcasts to “home in” on targets, and because spies might use amateur radio, the FCC ordered all amateurs to get off the air and dismantle their equipment. It also shut down many West Coast broadcast stations for several days to a week until initial fears of attack had died down. While some stations were silent for a few days, others broadcast only important news flashes. Taking amateurs off the air in wartime followed World War I precedent, while the silencing of regular radio broadcasting in California, Oregon, Washington, and the Territory of Hawaii was an isolated episode in this country's World War II procedures.

Personnel at all stations were confused as to what they should or should not transmit. The Naval Observatory stopped transmitting weather forecasts almost immediately, and station operators soon learned that, with a few exceptions, weather forecasts from other sources would be banned as well. The army prohibited the broadcast of any information on troop movements outside the country. In New York, the networks began to limit visitors

How United Press Covered the Pearl Harbor Story / Reprinted by permission of United Press International.

United Press Associations
INCORPORATED IN NEW YORK
GENERAL OFFICES
 NEWS BUILDING NEW YORK CITY

FRANK H. BARTHOLOMEW
 VICE PRESIDENT
 914 MISSION STREET
 SAN FRANCISCO, CAL.

December 11, 1941

United Press Pacific Division Clients:

So many of you wired or wrote your thanks for the beat we gave you last Sunday forenoon from Honolulu on the Japanese attack that we are using this blanket method of answering your inquiries as to how it was done.

Several days earlier, we had issued advance orders to the telephone company to put all leased wires into operation at a moment's notice. San Francisco bureau -- focal point of news from the Pacific -- was ready.

James A. Sullivan, San Francisco bureau manager, was on duty Sunday, Dec. 7.

At 11:24 a.m. the telephone rang. It was Mrs. Frank Tremaine, wife of our Hawaii manager in Honolulu.

"Fifty unidentified planes attacked Honolulu this morning," she began, relaying the information coming into our Honolulu bureau from Tremaine at Fort Shafter, from Night Manager William F. Tyree at another post, and from staff members on other assignments.

Ring of the flash signal on our leased wire in San Francisco bureau, with the White House announcement of the attack, came at 11:26, while Mrs. Tremaine continued to dictate:

"Several of the planes were shot down. Their attack seemed to center on Pearl Harbor and Hickam Field. Some bombs fell in the city.

"Just a minute -- there's an explosion or something outside. I'll run to the window and see what it was....There's a lot of excitement outside. I'll call you back later."

(The excitement was when an incendiary bomb landed 25 feet from The Advertiser building, home of the United Press bureau.)

Sullivan, in San Francisco, telephoned the story to United Press in New York, from whence the first direct account of the attack was placed on United Press wires.

Advance arrangements perfected several days earlier went into operation. Leased wires were opened to clients. United Press men in San Francisco telephoned you by long-distance to go to your office and turn on your teletypes. Cable re-write men and operators bulletined onto the wires the steady flood of urgent cables pouring in from Honolulu.

United Press Pacific Division Clients -- Page 2

In Honolulu, United Press was well prepared for the Japanese attack.

As Staffer Francis McCarthy said in the last story telephoned from Honolulu before all press communications were halted for nearly two days: "Now it is possible to reveal that the attack was not entirely unexpected."

McCarthy himself had arrived in Honolulu via Pan-American Clipper only four days before the attack, further augmenting the staff of the largest bureau operated in Hawaii by any news service.

Only United Press serves both morning and evening newspapers in Hawaii. Only United Press operates both day and night bureaus there.

United Press owns and operates the only news transmission system in Hawaii, including a full leased wire on the Island of Oahu and its own wireless-telegraphy plant for reception of news from the mainland. Other news services utilize the commercial routes and must yield priority to governmental traffic. With its own private system, handling press exclusively, United Press has no traffic-priority problem and has a clear channel at all times.

In Manila -- news center #2 in the War of the Pacific -- United Press similarly operates around the clock and owns and operates its own communications system for instantaneous and exclusive transmission of news.

Your news service has its own men at the places where news is going to originate in the next few days and weeks.

They include Harold Guard at Singapore; Francis M. Fisher at Chungking; Robert P. Martin at Shanghai; Jack Raleigh at Batavia; Darrell Berrigan at Bangkok; George Baxter at Hongkong.

History's biggest news story is breaking in territory strongly staffed by the largest world-wide press association.

Sincerely yours,



Manager, Pacific Division.

and station extra guards over control centers and transmitters—security precautions that quickly spread to stations in other regions.

On Monday, December 8, President Roosevelt went to Congress to request a declaration of war on Japan. As he was driven to the Capitol, the wire services and networks kept stations supplied with bulletins on Japanese attacks throughout French Indochina and the Philippines. At 12:40 p.m., Speaker Sam Rayburn introduced the President, who delivered his famous “Yesterday, December 7, 1941, a date which will live in infamy . . .” speech as millions of Americans listened on radio. That evening Roosevelt spoke to more than 62 million listeners, the largest audience for a single radio program up to that time.

American broadcasting rapidly switched to a wartime footing. The government established an Office of Censorship, which, within a month of the Pearl Harbor attack, published a voluntary code of censorship for broadcasting and other media. The chief censor was highly respected news commentator Elmer Davis. In January 1942 the FCC limited new station construction, and in April the War Production Board froze new receiver manufacture—both steps taken to preserve war-needed materials and labor supply. The government declared radio an essential industry to maintain its manpower strength, but the draft and enlistments shrank the work force anyway and equipment shortages hindered production and repairs. Broadcasting could not expand in number of stations or receivers, but programming services, news staffs, and time on the air increased sharply. Patriotic wartime elements became more common in regular and special programs on networks and local stations. Songs like “Remember Pearl Harbor” and “Praise the Lord and

Pass the Ammunition” had brief popularity, and tension-relaxing humor and entertainment went into high gear.

6•1 Innovations: Recording Methods

An important technical trend was toward miniaturization of components. By 1943 and 1944 military units carried two-way radio sets, the famous *walkie-talkies*, a new kind of radio transceiver (transmitter/receiver) construction that made equipment smaller, lighter, and more rugged. FM radio’s great value in ground tactical communications was facilitated by FM inventor Armstrong’s waiving his rights to royalties on FM military applications.

Military research also produced knowledge about efficient use of very high and ultra high frequencies. Information on interference and propagation at those frequencies proved crucial in the 1944–1945 FCC hearings on spectrum allocations for FM and television services (see 6.2).

Destined to have great postwar applicability was an innovation begun before the war and refined during wartime both here and abroad: the tape recorder. Until the mid-1930s, recordings of broadcast or musical selections could be made only with a disc recorder that made records—either the common 78-rpm musical recordings or 33 $\frac{1}{3}$ -rpm broadcast transcriptions. But the equipment needed for stability was too bulky and heavy for carrying or easy operation. Besides, war demand for shellac, then the primary ingredient in records, reduced the amount available for civilian use. Original transcription making switched from metal to very fragile glass bases.

In the late 1930s, several devices were under development as supplements or replacements for discs. In this country, magnetic wire and steel tape recorders re-

ceived what little attention there was. By 1935 Bell Telephone Laboratories was operating an experimental system for which the high-grade steel tape cost \$1.50 per foot. By 1938 the Brush Development Company had a steel tape dictating machine for sale. Overseas, the Germans used a steel tape magnetic recording machine to give time signals over various telephone systems and the BBC used a similar machine for recording its half-hour Empire Service programs. The sound fidelity was not very high, but such recorders would be adapted to record conferences or radio programs during the war. Since their manufacture had low priority, however, they were constructed by hand or adapted from existing units.

Another American firm, the Armour Research Foundation, developed a magnetic wire recorder when steel tape became scarce. This very thin—1/100 inch or so—wire could hold up to an hour of material per reel, although its quality was even poorer than steel tape and it often broke. One could repair a break by melting both ends with a lighted cigarette or by tying a square knot, but the resulting bumps could damage the delicate recording and playback heads. In 1943 Armour and its licensee Webster-Chicago (Webcor) began to manufacture a limited number of “portable”—50 pounds or more!—wire recorders for the military.

Various other techniques were explored. One used a base similar to motion picture film, on which grooves were magnetically etched. The Recordgraph, weighing 75 pounds, was so rugged it could be operated upside down. Although a number of war correspondents used these machines—including George Hicks in his famous D-Day reports—portable film recorders could be used only for low-quality voice recordings. These could be stored for a long time and were very cheap, but the

film wore out after it had been played 20 or 30 times.

The eventual winner was the paper or plastic base magnetic tape, which provided excellent sound quality with little or no surface noise. In 1941 the Germans programmed Radio Luxembourg, which they had captured in 1940, with prerecorded tapes operating at 30 inches per second (ips), four times the present broadcast standard. They provided such good sound that American forces moving across Europe in 1944 were surprised to capture radio stations operating only with large reels of tape and not live performers. By 1945 communications men had brought a number of German Magnetophones, including portable ones, to the United States for evaluation. The implications for post-war broadcasting were not overlooked (see 7.12).

6•2 Stations: Status Quo for the Duration

During the war, from 1942 through 1945, only 34 new AM and 28 FM stations took to the air, whereas earlier the number of stations had increased by 30 to 50 each year. This reduction was due not to economics but to government policy.

6•21 *The AM Industry*

On February 23, 1942, the FCC announced that, to preserve construction and electronic equipment for war needs, it would issue no permits for new station construction. In April, the War Production Board strengthened the FCC order when it limited construction of any kind to applicants who had all the needed materials in hand, or to builders of noncommercial educational stations. The FCC also froze major alterations to existing stations “for the duration” and, to conserve electrical

power, tubes, and components, reduced requirements for minimum number of hours of broadcast service, and required stations to lower their power output by a rarely noticeable 20 percent. It ordered a massive inventory of tubes and unused transmitters in the hands of licensees and distributed the information to military and commercial broadcasters so that available supplies could be fully used. As trained engineers and other technical personnel became scarcer beginning in 1943, the FCC reduced requirements and restrictions so that other persons could read meters and do minor maintenance.

By early 1944, electronic production had improved enough for the FCC to authorize a limited number of new Class IV 250 watt local stations and allow facilities changes when matériel seemed to be available. Conditions tightened up again early in 1945, and new construction was limited to towns lacking primary service and to situations requiring minimal construction materials. Full wartime restrictions remained until August 1945 (see 7.21).

A strong indication of the FCC's faith in broadcasting's stability and ability to function in the public interest was the announcement on December 14, 1943, that for the first time it would license stations for the full statutory three years. Although both the 1927 and the 1934 acts had authorized the three-year term, for many years license renewal had been required every six months, then one year, and finally two years. The full license period, of course, meant less paperwork for stations and commission, both of which were operating with severe manpower shortages.

6•22 *FM Pioneering*

When construction of new stations was frozen during the war, there were

more than 900 AM stations. FM service, however, was just getting started. Many applications for construction permits were withdrawn because of lack of building and electronic materials, and the FCC eased its rules to allow FM stations that provided some public service to operate with whatever equipment they could gather. Philadelphia stations kept FM going in the face of replacement equipment shortages by rotating time on the air so that no station was broadcasting more than two days a week. They pooled all spare parts, programming material, and personnel.

In August 1943, the FCC dropped the cumbersome system of FM call letters using letter and number combinations, and many FM stations owned by AMs in the same market now took their sister station's call letters with an -FM suffix.

6•23 *Television during the War Years*

When the FCC gave television a green light for commercial development in spring 1941 (see 5.15), it also deleted one of television's 19 channels and deferred action on CBS's suggestion to consider color television. The decision to allow commercial television created a problem of receiver obsolescence, but only a few thousand sets were affected, and the manufacturer could convert them.

On July 1, 1941, both CBS and NBC New York stations converted from experimental to commercial status, becoming WCBW (CBS) and WNBT (NBC). By FCC regulation, both stations were on the air about 15 hours a week. Most programs—discussions, game shows, musical programs, and wrestling and boxing matches—were produced within the studio. Some sports events were covered live on a remote basis. Films, particularly free ones, were widely used; indeed, program sched-

ules were divided into 20-minute multiples—just right for two reels of film (18 minutes in 35mm) and some commercials. Newscasts resembled motion picture newsreels in content. The first television commercial reportedly was a picture of a Bulova watch showing the correct time, and Lever Brothers, Procter & Gamble, and Sun Oil also were early sponsors of television programs. According to the first television rate card, WNBT's, one hour of prime time in New York cost \$120, compared to \$10,700 in 1975 and the 1941 radio rate of \$1,200. (See the rate card in the box on page 152.)

A handful of other stations converted to commercial operation in later 1941 and early 1942: WPTZ (Philco) in Philadelphia, what would become KTLA in Los Angeles, WRGB (named after GE engineer W. R. G. Baker) in Schenectady, what would become WBBM-TV in Chicago, and a Zenith-owned station in the same city. But the audience grew very slowly, since very few sets—90 a month in New York early in 1942—were for sale, and their price was very high—several hundred dollars for a five- or eight-inch picture. By the time the United States entered World War II, between 10,000 and 20,000 sets were in use, half in New York and the rest in Philadelphia, Chicago, and Los Angeles.

In December 1941, WCBW produced a 90-minute documentary on the Pearl Harbor attack, only hours after it happened. It included the latest news bulletins as well as analysis backed up by maps, charts, and models of affected areas in Hawaii and the Philippines. Later both New York stations presented War Bond drives and other patriotic material. NBC's television outlet carried a series of training programs for air raid wardens in New York, which many of them viewed on sets that individual owners loaned to firehouses and other posts.

The green light given to television in mid-1941 changed to red on May 12, 1942, when a War Production Board order, implemented by the FCC, forbade further building of stations so that materials could go to the war effort. Ten commercial stations, mostly converted from experimental ones, were then on the air, together with some remaining experimental transmitters. The commission allowed licensees that had construction permits and the necessary equipment to finish building in order to "keep alive this new art during the war." The FCC had previously dropped the minimum telecast hours from 15 to four a week in order to stretch matériel and manpower. Six stations throughout the country continued regular program service throughout the war. In New York, only the Dumont station, started in June 1942, maintained regular although limited service. Both NBC and CBS cut down to skeleton organizations and dropped television broadcasting altogether until summer 1944, after Dumont had begun a full commercial schedule.

Everyone was learning during the 1942–1945 wartime hiatus. The military learned how to use many of the higher-band television frequencies. Of the few thousand people with sets, many learned how to keep them working; about three-quarters of the sets survived the war, although many were in poor condition. While viewers enjoyed increased entertainment programming on the few stations, it was still in the era of monochrome (shades of gray) makeup and extremely strong—and hot—lighting that caused perspiration to fall from actors and then literally to boil off tabletops. A young man hired off the street as a cable puller one day could become a cameraman the next and a director shortly thereafter; for a brief interval cameramen were considered artists rather than technicians, and ingenuity

compensated for small budgets and limited manpower. Program innovations were legion. GE presented the first complete televised opera in 1943; three stations interconnected to show an original short film a year later; and a New York station, with a commercial sponsor, offered the first musical program specially written for television. The presidential election of 1944 was sketchily covered, with local coverage in the convention city of Chicago sent on film to New York, since there was no direct coaxial cable or microwave link between East and Midwest.

The first trade association, the Television Broadcasters Association, was formed early in 1944, and both NBC and CBS announced plans for postwar television networks. The new image orthicon camera tube could get excellent pictures with only a small fraction of the light needed by the older iconoscope. Experiments with lighting, makeup, UHF transmissions, and film projection were conducted. On V-E and V-J days in 1945, WNBT telecast 15 hours of special programming about the ending of the shooting in Europe and Asia which was carried live on stations in Schenectady and Philadelphia as well as New York. Baseball broadcasts on one New York station could cause workers at another station to desert their posts and flock around a receiver (behind closed doors). But, it must be remembered, few people saw any of this, and television in effect marked time behind the scenes during the war—planning for the day when the light would turn green again.

6•3 The Splitup of NBC and Formation of ABC

With the limited growth in AM stations, the proportion of network radio affiliates rose from 60 percent of all stations in 1940–1941 to 95 percent in 1945.

Never before or since would network programming so dominate radio. Almost all the approximately 950 stations on the air had affiliations with one network, and many with more than one, especially if they were the only station in a smaller community. An increasingly large proportion—more than 40 percent at war's end—was affiliated with Mutual, usually smaller and less important stations. The NBC-Red and -Blue networks combined affiliated with about 35 percent of all stations and CBS affiliated with another 16 percent.

The major development during the war years was the appearance of two new networks. The Keystone Broadcasting System, established in 1940 and grown substantially by 1945, was a network in name only, as it existed to supply programs by transcription to secondary market affiliates—some 200 by the end of the war. It provided up to 28 hours a week in scripted and transcribed programs to stations that were apt also to be affiliated with Mutual or another major network.

An important aftermath of the FCC chain broadcasting rules and extended litigation over their implementation (see 5.83) was RCA's splitting its Red and Blue NBC networks into separate but wholly owned divisions. Red was called "NBC" over the air, and Blue "the Blue Network." When the Supreme Court upheld the FCC chain broadcasting rules in 1943, NBC had to divest itself of one of its networks (see 6.85). NBC sought a cash buyer for Blue, which had always had less important affiliated stations and had carried more sustaining programs than the powerful and popular Red network. At the end of July, just two months after the Supreme Court decision, RCA announced that the Blue network had been sold to WMCA (New York) owner Edward J. Noble, a candy manufacturer who had earned his fortune

with Life Savers, for \$8 million. The FCC approved the sale in mid-October, changing the ownership of New York flagship station WJZ and several others, and divorcing the Blue Network, Inc. from RCA. In 1945 the network became the American Broadcasting Company (ABC).

The war killed another attempt to establish a broadcast network. In 1940, just as the FCC announced commercial FM authorization effective for the coming year, some 15 FM station owners led by John Shepard III announced plans for an FM-only commercial network. They obtained a construction permit for a New York station, to be the "American Network" flagship, with the idea of relaying FM programs directly off the air, since FM was static-free, instead of leasing telephone circuits from AT&T as AM networks had to do. The first program was so relayed by seven northeastern stations in December 1941, but when the war froze FM station construction, the American Network was left with a bunch of paper affiliates unable to get on the air. This delay, plus pressure by the AM chains, led to the plan's demise and sale of its name to the Blue Network in mid-1944.

6•4 Education Struggles On

While educational broadcasting on AM remained limited in size and scope through the war years, a new hope had appeared when the FCC reserved FM channels for potential educational broadcasting licensees (see 5.4). By the end of 1941, however, only two educational FM stations had gone on the air. Although the construction freeze of 1942 exempted educational stations, the scarcity of construction materials and broadcast equipment coupled with the slow decision-making processes of educational institutions com-

bined to limit educational FM growth during the war to 12 authorizations and 6 stations on the air when the war ended in mid-1945.

Still, educational institutions made known their plans to apply for construction permits at the end of the war. Some states, notably Wisconsin, envisioned statewide educational networks of FM stations to broadcast school, college, and adult education programming. Educators realized that, after more than a decade of talking about educational radio, they finally had means to accomplish it—after the war.

6•5 Advertising: Ten-Cent Dollars

While it may not be politic to say so, World War II was one of the best things to happen to radio advertising. The impetus for AM radio's gravy years was the government imposition of a 90 percent excess-profits tax on American industry to discourage profiteering on war contracts. However, the tax bill had a provision that made excess profits used in advertising taxable at only the normal rates—if at all. Business directors soon realized they could buy a dollar's worth of advertising time or space for what was, in effect, ten cents. As paper rationing in 1943–1945 and shortages of newsprint led to smaller newspaper editions and often less advertising space, a number of advertisers switched to radio, which faced no such problem. Radio's share of advertising dollars increased from 12 percent in 1941 to 18 percent of a much larger base in 1945. Radio broadcasting passed newspapers as a national advertising medium in 1943. By 1945 more than 37 percent of national—but not local or regional—advertising dollars went to radio, with magazines a close second and newspapers third.

From 1940 to 1945, gross revenues

for the networks and their owned-and-operated stations rose from \$56.4 million to \$100.9 million. Before-tax income, however, remained proportionately static—25 percent to 23 percent of revenues over the years covered—partially due to greatly increased expenses in covering war news around the world. The overall network advertising pattern was concentrated. Three advertising agencies, J. Walter Thompson, Young & Rubicam—both of which are still important—and Dancer-Fitzgerald-Sample, purchased about 25 percent of the time on the Red, Blue, and CBS networks. In 1945 CBS had 13 sponsors each of which bought more than \$1 million worth of time, and three that bought more than \$4 million worth, General Foods, Lever Brothers, and Procter & Gamble—still among the largest advertisers in the 1970s. Just seven sponsors and six agencies accounted for half of CBS's billings. The NBC-Red network had 11 purchasers of more than \$1 million in time, ABC had 9, and Mutual had 3. Twelve sponsors and 5 agencies accounted for 40 percent of ABC's 1945 billings, while 6 sponsors and 5 agencies accounted for one-third of Mutual's. This concentration was not a wartime creation, but the high rate of income and profit was, thanks to the ten-cent dollars and the wartime rationing of paper.

While the networks and their 30 or so stations skimmed off the cream of revenue, more than one-third throughout these war years, the remaining 800 or so stations prospered as well. Gross revenues of the non-network-owned operations more than doubled from 1940, when 734 stations collected \$90.6 million, to 1945, when 873 stations earned \$198.3 million; but their net before-tax profit increased even more, from 21 to 30.5 percent of revenues in the same years. Some stations either had no income or did not report it

to the FCC, for Appendix C, table 1, shows about 30 to 50 more stations on the air each year than reported financial data. While one-third of all stations reported losses in 1939, less than 6 percent were in the red six years later—probably the lowest such figure in the history of radio. The entire radio industry, and especially the local stations, were profiting. While all radio stations increased their return on investment twofold, local stations enjoyed an 800 percent increase from 1939 to 1945.

Most radio advertising in these years was for insurance and for processed foods, drugs, toiletries, and tobacco—items which were often rationed but never unattainable during the war. Regional and national firms whose normal consumer manufacturing was halted for the duration turned to institutional advertising. For example, the major auto makers advertised mainly to keep the corporate name in the public's mind; the slogan "when better cars are built, Buick will build them" could be used even while the automobile firm was making tanks for the army. Since companies seeking to enhance their corporate name rather than sell a specific product often chose to sponsor prestige drama or musical programs on the larger stations or the networks, such programming became more common. Advertising agencies remained in control of most radio advertising and much of the programming.

The few commercial FM stations carried little or no advertising, not because they did not want to or try to sell time but because their audiences were too small and their broadcasting hours too few to attract sponsors. FM survived the war either on the profits of co-owned AM stations or out of the pockets of their respective owners. Stations kept expenses down by duplicating network shows or by programming recorded music.

6•6 Programming Patriotism

Like virtually all other aspects of American life, American radio reflected the war. There had been no overall radio industry planning for wartime operation, though individuals undoubtedly had given thought to it, particularly newsmen. Thus, when war came, radio took a while to adjust. With the exception of news broadcasts, radio in the first weeks after Pearl Harbor sounded much like prewar broadcasting. An indication of what was to come aired on December 15, when Norman Corwin's *We Hold These Truths* reminded Americans that the Bill of Rights was worth fighting for. The program was a combination of documentary, inspiration, news reporting, and patriotic fervor, but it elicited favorable comments.

Essentially, radio programs took three related approaches to the war. Getting most attention were special programs—usually appeals for scrap materials, the sale of War Bonds, and the like—built around major screen and radio stars. Probably the best-known effort of this kind was singer Kate Smith's 57 appearances during one day, February 1, 1944, in a War Bond appeal. She was later credited with having helped sell \$112 million worth.

The second and most common approach was to insert war-related material into existing program series. Drama programs included references to rationing or to a son in the service; variety shows made increasing use of servicemen or took place at military camps, and musical programs featured war-related songs. Although "Coming in on a Wing and a Prayer" and "He Wears a Pair of Silver Wings" did well on *Your Hit Parade*, so did a woman's complaint, "They're Either Too Young or Too Old." Most songs as usual dealt with romance rather than warfare.

The third approach was to introduce a new program series devoted to the war or heavily reflecting its impact on the home front. An early example was *This Is War!*, a 13-week series of hour-long programs aired on 700 stations, counting those that aired it by transcription rather than live, on all four networks. The series was developed by and supported with funds of the government and the networks. Norman Corwin was the director and wrote half of the programs. The first went on the air on Valentine's Day 1942 while American eyes were focused on the worsening situation in the Philippines. Each succeeding Saturday evening for the next 12 weeks a different program attracted an estimated 20 million listeners while focusing on some aspect of the war—the White House role in this and past wars; the navy; the army; the air corps; our allies, now being referred to as the United Nations; the enemy and his propaganda. Famed writers Norman Corwin, Maxwell Anderson, Philip Wylie, and Stephen Vincent Benét and many Hollywood and radio stars contributed their efforts. According to the prospectus for the series, the producer's aim was to inspire, frighten, and inform all at the same time. Reaction to the series was generally positive, except for the complaint that the series aired simultaneously on all four networks and gave listeners no alternatives. This first all-network production also gave rise to a fear that government might dominate programming.

6•61 Office of War Information

Section 606 of the Communications Act of 1934 gives the President power to control operations of broadcast stations and other telecommunications facilities in time of war or other national emergency.

Many broadcasters feared that the government would take over radio completely, as it had in World War I, thus silencing commercial broadcasting for the duration. As it happened, Section 606 was not invoked for broadcasting; but two government agencies were set up to handle issues of vital communication on the one hand and censorship on the other (see 6.84).

In June 1942, President Roosevelt established the Office of War Information (OWI) and named veteran and highly respected *New York Times* and CBS news commentator Elmer Davis to head it. OWI, combining the operations and functions of four older and overlapping agencies, was intended to meet three needs of audiences in the United States and abroad: the need for news; the need for information as to what the public should do and when and how to do it; and the need for truthful explanations of war issues, the enemy and our allies, and, especially, the role of work and war production at home as well as the sacrifices war forced on everyone. Roughly two-thirds of OWI's budget went for overseas operations (see 6.92), leaving only one-third for the domestic branch. A section of the latter, the Radio Bureau, headed by a radio industry executive, was created to deliver important war-related messages efficiently to radio listeners.

In its first weeks of frenzied activity, the Radio Bureau established a general policy: the role of government was to steer—with “suggestions” for voluntary compliance—rather than direct or command, the flow of information through privately owned communication media. It devoted a great deal of effort to involving station managers and respecting their views. In line with this policy, the Radio Bureau decided to insert war messages into regular popular entertainment programs instead of creating special programs and to tailor war messages for specific publics. It would

emphasize quality rather than saturation quantity, and it would help broadcasters superimpose the war and its needs on existing programming rather than force major changes in content. In that way, popular radio programs would help maintain morale while delivering their large audiences to OWI for its war-related messages. OWI was behind a number of special program series, however. *This Is Our Enemy* appeared on the networks to enlighten listeners as to what the Axis powers stood for and had done. *You Can't Do Business With Hitler* ran by transcription on hundreds of stations, describing the broken promises of Nazi Germany.

Perhaps OWI's key job was to *limit* the flood of material that hit broadcasters in early 1942 as the country switched to a war footing. The problem was epitomized by the station that received a 20-inch stack, 16 pounds, of messages, scripts, and transcriptions for free-time and urgent broadcast in a single month! OWI had the task of coordinating and clearing all government messages, including those of the military services, and establishing priorities as to their importance at any given time. By OWI's limiting the number of government war messages and setting up specific ways of allocating them across the broadcast schedule, both advertisers and broadcasters could bear the costs as part of the war effort. At the same time, the reduction of messages kept the public from being saturated with governmental information and exhortation on top of the war news and consequently ignoring the whole issue.

6•62 News

The major role of radio during the war was, of course, to report the war's progress. The amount of radio news, in-

cluding specials and on-the-spot coverage, increased by more than 1,000 hours a year to 1943, when it began to taper off. A look at the last column in the table on this page indicates that scheduled newscasts, at least, dropped off in the final year of the war. Although specific data are lacking, overall time devoted to news probably dropped off that year too, since the war ended in Europe in May and in the Pacific in August, and since audiences were tiring of constant war news by early 1945, when the final result of the fighting seemed clear.

Within that trend, other changes were noticeable. Network news increased mainly in evening hours, and by 1944 news specials and newscasts made up 16–20 percent of network program schedules. In

many cases, fewer commercials were given during newscasts, CBS considering jingles and other “undue gaiety” unfitting for serious wartime news.

At first, because of technological limitations and censorship, war reporting was an after-the-fact recitation of events. The networks still adhered to their ban against recordings except under most unusual conditions. But military censors distrusted live reports for the same reason that they eliminated or severely restricted weather reports: the danger that apparently innocuous phrases or events—a station going off the air during an air raid, the absence of a reporter who might be expected to accompany an invasion force—would give information to the enemy.

The Growth of Network Wartime News: 1940–1945/That the war increased the amount of radio network time devoted to news seems obvious—but here are figures that demonstrate how great that increase was. See text for other comment on these figures.

Year	Total Yearly Hours of News*					Scheduled Newscasts (quarter hours per week) All Four Networks Combined
	NBC(Red)	CBS	Blue(ABC)	Mutual	Total	
1940	636	769	681	310	2,396	70
1941	983	829	796	840	3,448	66
1942	1,280	1,385	836	1,131	4,632	108
1943	1,641	1,454	909	1,370	5,274	123
1944	1,726	1,497	1,062	1,237	5,522	145
1945	#	#	#	#	#	135

* = includes regularly scheduled newscasts, specials, on-the spot broadcasts

= indicates figures not available

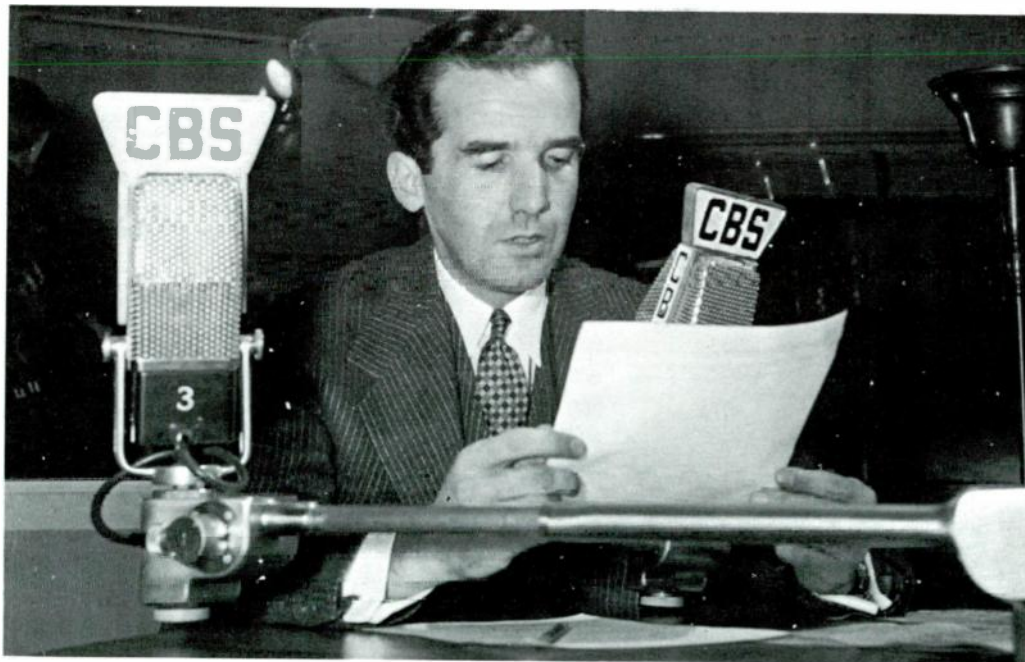
Source: First five columns from *Broadcasting* (April 23, 1945), page 23; last column figured from data in H. Summers. *A Thirty Year History of Programs Carried on National Radio Networks in the United States: 1926–1956* (Columbus: Ohio State University, 1958; reprinted by Arno Press, 1971).

But slowly censors were convinced that radio would not harm the war effort, as long as broadcasters took precautions against unauthorized persons using their facilities (see 6.84). Technicians were able to transmit usable shortwave signals to the United States. When reporters were allowed in the war zones or even neutral foreign capitals, they began filing live, on-the-scene stories such as Edward R. Murrow's 1940–1941 evening reports to CBS (see 5.63).

Radio reporters with the invasion fleet off North Africa in November 1942 provided a blow-by-blow account of the troops landing against the Vichy (collaborationist) French. By 1944 reporters for the radio networks were covering commando

raids against the coast of France, going on air raids with bomber fleets, reporting on England at war, and covering the first island invasions of the South Pacific. Reporters unknown before the war became identified with the area from which they spoke. The American radio audience associated ex-newspaperman Eric Sevareid with the fall of France in 1940 and later, reporting his survival of a plane crash deep in the jungle, in the China-Burma-India theater. Howard K. Smith reported for CBS from Europe. Charles Collingwood, also with CBS, reported the North African war and, later, D-Day and troop movements through France and into Germany. Webley Edwards and others reported Pacific naval battles and island-hopping inva-

A Great Reporter: World War II / Edward R. Murrow's reports about World War II in Europe, particularly his "This . . . is London" signature on early CBS broadcasts from Britain, made the war—and our future allies—familiar to millions of Americans. Photo credit: Culver Pictures, Inc.



sions that first stopped and then turned the tide against the Japanese. Edwards reported live from a B-29 during an air raid against Japan. Earlier, one of Murrow's most memorable broadcasts came after he flew on an air-raid mission over Berlin, against the orders of his CBS superiors.

Some famous reporters and commentators worked at home: H. V. Kaltenborn, an anchorman for NBC; Lowell Thomas, continuing his evening CBS newscasts begun in 1930; John Daly; Robert Trout; and others. Pioneer announcer Graham MacNamee, only six months before his death, was on hand in New York when the giant French liner *Normandie*, being converted to a troopship, burned and capsized.

Of many notable broadcasts, D-Day—June 6, 1944, when the Allies invaded France—was particularly important. As George Hicks of CBS recorded troops going ashore from a navy ship, listeners could hear aircraft and anti-aircraft guns in the background. The recording was sent to the United States by short-wave for later broadcast. Radio's role on D-Day was both tactical, calling upon resistance groups to hamper the German army, and morale-boosting here and in Europe—although the BBC lost some of its tremendous credibility when it broadcast, under orders, some false reports to mislead the Germans.

Radio's first intensive reporting of a President's death in office came on April 12, 1945, when Franklin D. Roosevelt, just starting his fourth term, died of a stroke in Georgia. First reports from network reporters around 5:45 P.M. produced stunned confusion. The deaths of other public figures were reported erroneously. In the middle of a children's adventure program, one character departed from the script to say "Just a minute, kids—President Roosevelt just died"—followed by a few

seconds that seemed like minutes until the news announcer confirmed the report. Within two hours of the first radio flash of the President's death, stations were reporting national and international reaction. Radio listeners heard four days of repeated news, reviews of the President's career, overviews of the war, predictions of the effect of F.D.R.'s death on the war effort, and somber music. The networks and many local stations deleted all commercials for the four days between his death and burial in Hyde Park, New York. Broadcasters themselves were strongly affected. When Arthur Godfrey reported the funeral procession moving down Washington's Pennsylvania Avenue over CBS, listeners heard him break into tears at the

The Show Must Go On versus Circumstances beyond Control

The tradition that the show must go on in spite of disasters received a severe test from World War II. Many individuals and stations managed to give recognition to the tradition, even when normal programming was impossible. Among them was the reporter speaking from Manila who was cut off in mid-sentence when a Japanese bombing attack knocked the station off the air shortly after Pearl Harbor. At the end of the war, he returned to the station and went on the air with "Hello, NBC—as I was saying before being so rudely interrupted . . ." followed by his four-year-old report! A similar story is told about BBC television, which was ordered to leave the air immediately after mobilization in 1939 so that its transmitters and towers could be used for the first crude radar aircraft warning system. Without even signing off, it "went to black" after a Walt Disney cartoon, "Mickey's Gala Premier." When the service returned to the air approximately eight years later, the same cartoon was included in the inaugural broadcast.

Radio Brings the War to the Home Front / In mid-April 1945, reporters followed the advancing allied armies into what was left of Nazi Germany. On April 15, 1945, CBS radio correspondent Edward R. Murrow broadcast his impressions of the liberation of a large concentration camp.

... Permit me to tell you what you would have seen, and heard, had you been with me on Thursday. It will not be pleasant listening. If you are at lunch, or if you have no appetite to hear what Germans have done, now is a good time to switch off the radio, for I propose to tell you of Buchenwald. It is on a small hill about four miles outside Weimar, and it was one of the largest concentration camps in Germany, and it was built to last. As we approached it, we saw about a hundred men in civilian clothes with rifles advancing in open order across the fields. There were a few shots; we stopped to inquire. We were told that some of the prisoners had a couple of SS men comered in there. We drove on, reached the main gate. The prisoners crowded up behind the wire. We entered.

And now, let me tell this in the first person, for I was the least important person there, as you shall hear. There surged around me an evil-smelling horde. Men and boys reached out to touch me; they were in rags and the remnants of uniform. Death had already marked many of them, but they were smiling with their eyes. I looked out over that mass of men to the green fields beyond where well-fed Germans were ploughing.

A German, Fritz Kercheimer, came up and said, "May I show you round the camp? I've been here ten years." An Englishman stood to attention, saying, "May I introduce

myself, delighted to see you, and can you tell me when some of our blokes will be along?" I told him soon and asked to see one of the barracks. It happened to be occupied by Czechoslovakians. When I entered, men crowded around, tried to lift me to their shoulders. They were too weak. Many of them could not get out of bed. I was told that this building had once stabled eighty horses. There were twelve hundred men in it, five to a bunk. The stink was beyond all description.

When I reached the center of the barracks, a man came up and said, "You remember me. I'm Peter Zenkl, one-time mayor of Prague." I remembered him, but did not recognize him. He asked about Benes and Jan Masaryk. I asked how many men had died in that building during the last month. They called the doctor; we inspected his records. There were only names in the little black book, nothing more—nothing of who these men were, what they had done, or hoped. Behind the names of those who had died there was a cross. I counted them. They totalled 242. Two hundred and forty-two out of twelve hundred in one month.

As I walked down to the end of the barracks, there was applause from the men too weak to get out of bed. It sounded like the hand clapping of babies; they were so weak. The doctor's name was Paul Heller. He had been there since 1938.

As we walked out into the courtyard, a man fell dead. Two others—they must have been over sixty—were crawling toward the latrine. I saw it but will not describe it.

In another part of the camp they showed me the children, hundreds of them. Some were only six. One rolled up his sleeve, showed me his number. It was tattooed on his arm. B-6030, it was. The others showed me their numbers; they will carry them till they die.

An elderly man standing beside me said, "The children, enemies of the state." I could see their ribs through their thin shirts. The old man said, "I am Professor Charles Richer of the Sorbonne." The children clung to my hands and stared. We crossed to the courtyard. Men kept coming up to speak to me and to touch me, professors from Poland, doctors from Vienna, men from all Europe. Men from the countries that made America.

... Murder had been done at Buchenwald. God alone knows how many men and boys have died there during the last twelve years. Thursday I was told that there were more than twenty thousand in the camp. There had been as many as sixty thousand. Where are they now?

As I left that camp, a Frenchman who used to work for Havas in Paris came up to me and said, "You will write something

about this, perhaps?" And he added, "To write about this you must have been here at least two years, and after that—you don't want to write any more."

I pray you to believe what I have said about Buchenwald. I have reported what I saw and heard, but only part of it. For most of it I have no words. Dead men are plentiful in war, but the living dead, more than twenty thousand of them in one camp. And the country round about was pleasing to the eye, and the Germans were well fed and well dressed. American trucks were rolling toward the rear filled with prisoners. Soon they would be eating American rations, as much for a meal as the men at Buchenwald received in four days.

If I've offended you by this rather mild account of Buchenwald, I'm not in the least sorry. I was there on Thursday, and many men in many tongues blessed the name of Roosevelt. For long years his name had meant the full measure of their hope. These men who had kept close company with death for many years did not know that Mr. Roosevelt would, within hours, join their comrades who had laid their lives on the scales of freedom.

From Murrow broadcast of April 15, 1945, from Buchenwald. Reprinted courtesy of the Estate of Edward R. Murrow.

end as he quickly turned the program over to a studio announcer. Although the Republicans bitterly opposed Roosevelt at election time, most Americans considered him the architect of the victory that was only a few weeks off; and the suddenness and irony of his death, after more than a dozen years in office, disturbed them deeply.

After a false alarm, radio finally reported the end of the war in Europe in early May 1945. Microphones stuck out of studio windows over the next several hours brought the sounds of celebrating America to listeners beyond the celebration sites. Three months later, radio reported the awesome and almost unbelievable effects of the first, Hiroshima, atomic bomb. Shortly after the dropping of the second, Nagasaki, atomic bomb came the report of V-J (Victory over Japan) day, and in September the moving broadcast of the surrender ceremonies on the battleship *Missouri* in Tokyo harbor.

For the true flavor of what radio sounded like during four years of war, one must listen to the many recordings that have survived. Reading about a broadcast, or even reading the original script, cannot convey the excitement of that spoken report. Besides, the unscarred American listener could hear the first three short notes and one long note of Beethoven's Fifth Symphony, signifying the Morse code three dots and a dash of "V for Victory," with a different reaction from the impact the underground guerrilla fighters felt when they heard those notes broadcast in Nazi-occupied Europe.

Radio and television news today—despite all our experiences since World War II—reflects the traditions that developed in the 1941–1945 period, when broadcast journalism came of age. The newscasters of World War II became the anchormen of the 1950s and 1960s.

6•63 *Political Broadcasting*

In 1944, because of his carefully concealed deteriorating health and his understandable preoccupation with the war effort, Roosevelt carried his fourth presidential campaign almost exclusively on radio. Although the Republican nominee, the articulate and respected Governor Thomas E. Dewey of New York, was the most effective radio speaker to run against Roosevelt, the Republicans proposed a series of half-hour dramatizations of campaign issues rather than long, dry speeches. The networks refused to air them, however, fearing that listeners, used to drama as entertainment, would confuse entertainment with news. Dewey and his supporters had to resort to conventional speeches, which they did in the heaviest use of radio in a campaign up to that time. On the Democratic side, a committee of Hollywood personalities made effective one-minute spot announcements to point out Republican problems and limitations. After the campaign, more than half of those asked in a national poll identified radio as their most accurate source of political information, while just over one-quarter chose newspapers and only 6 percent chose magazines. Political radio perhaps came of age on election night 1944 when, for the first time, all the networks dropped their regular programs in favor of continuous election returns and analysis. This was to become the standard format in later elections. Reports also were beamed overseas to the armed forces by OWI and other shortwave facilities (see also 6.61).

6•64 *Music and Variety*

Despite the increase in war-related news programming, music remained the staple of radio. The networks scheduled

about one-third of their hours to popular music, with some classical music and opera on weekends. Popular music was still synonymous with the big bands of Glenn Miller, Benny Goodman, Harry James, and others. Of the new stars coming up Frank Sinatra was most notable. The young singer created a sensation among the "bobby-soxers," and vast crowds of teenage girls crammed New York's Paramount Theater on Times Square to hear him and squeal their delight. Sinatra soon had his own radio show and also appeared on United Service Organization (USO) tours which entertained the armed forces. Many musical groups kept up their home front programs and commitments while touring domestically and overseas before military audiences, but some joined the armed forces and served in the "Special Services."

The prime listening periods for classical music were Saturday and Sunday. On Saturday afternoons Milton Cross narrated the broadcasts of the Metropolitan Opera from New York for the Blue Network; Arturo Toscanini conducted the NBC Symphony Orchestra, first for NBC-Blue on Tuesday and Saturday evenings on a sustaining basis and then as a sponsored program for NBC-Red on Sunday evenings. On Sunday afternoons CBS offered the New York Philharmonic, first sustaining and then sponsored.

Many local stations used a similar pattern. Besides airing most of the network musical programs, affiliates added some of their own. Many large stations employed an orchestra and popular music groups. At smaller stations and nonaffiliates, where music averaged about half their total schedule, recorded music became more common. During the protracted American Federation of Musicians (AFM) dispute (see 6.83), more live orchestras played than otherwise might have been the case.

Almost all programs during the war had at least a thin veneer of wartime topicality, especially the variety shows. Musical programs often included war songs, but the variety programs featured soldiers as participants, originated in military camps and naval bases, and nearly always tried to build up patriotic fervor. New programs built around the military included NBC's *Army Hour*, beginning in April 1942, an army-produced drama-news feature-music combination that gave the civilian an image of army life, and *Command Performance*, produced by the OWI Radio Branch starting in March 1942, a collection of music and variety acts requested by servicemen. The show was broadcast on networks here and by Armed Forces Radio stations overseas.

Many stars got their radio start in the war years. Arthur Godfrey, after some years in Washington, went to the New York big time for CBS in 1941. Two years later Perry Como and Ed Sullivan began their own radio programs. Sullivan, a veteran Broadway newspaper columnist, was no smooth "personality" on the air, as audiences were to see for two decades on television, but he and his staff put together a well-balanced and audience-attracting program.

Some variety programs might have been classified also as situation comedies, especially those starring Jack Benny, ventriloquist Edgar Bergen and his dummy Charlie McCarthy—an unlikely but very popular gimmick on a sound medium—and Bob Hope. These were among the ten most popular network shows during the war, perhaps because they helped audiences forget the serious world outside.

Variety was somewhat harder for local stations to produce, but many middle- or large-size stations tried. Their shows usually reflected local culture and background—"country" dominated in the

South and West, Scandinavian farm life in the upper Middle West—and centered on a local orchestra, vocalist, or station-created talent agent. Amateur hours still were popular, and stations near military installations were likely to inject more military flavor into their programs than stations further removed.

6•65 Drama

There were two trends in wartime network drama: daytime serial soap opera declined by one-third, and serious drama increased noticeably, fueled by the advertisers' ten-cent dollars (see 6.5). While soap operas had been at their peak in 1940–1941 with nearly 75 hours a week, in the early 1940s they gave way somewhat to quiz programs and other variety daytime programming. The *soaps* suffered from overcrowding and similarity, and at first they ignored wartime events except for an occasional “son lost in action” or suitor “gone off to a war industry job,” when an actor left for war. New soapers went on the air, but more went off, while the popular standards like *Helen Trent* and *Ma Perkins* plodded quietly on.

Wartime action-adventure programs also showed slight effects of war. The children's serial hero Jack Armstrong was on the Philippine island of Mindanao looking for uranium-235—three and one half years prior to announcement of the atomic bomb—when war came, and script writers moved fast to remove him from uncertainty and danger. Other thriller heroes went to war against the Axis, and stereotypical Japanese and German villains soon were common in *Suspense*, *Inner Sanctum*, and, starting in 1944, *The FBI in Peace and War* as well as in children's adventure serials. These action-adventure

and crime detective programs were building to a postwar peak of popularity.

Favorite situation comedies that started in the 1941–1945 period included *The Great Gildersleeve*, which grew out of a character on *Fibber McGee and Molly*—a *spin-off*, the way many later radio and television programs originated—*The Life of Riley*, and *Ozzie and Harriet*. The last, a long-running radio and later television series, began in 1945 after Ozzie Nelson gave up his band and married his lead vocalist Harriet Hilliard.

The serious drama programs that advertiser ten-cent dollars made possible were both dramatic and documentary, the latter dealing almost always with military affairs. Some programs, like *First Line of Defense*, *Service to the Front*, and *Pacific Story*, the networks offered to stations on a sustaining basis, with production help from various government agencies. Of the dramatic type, U.S. Steel sponsored the *Theater Guild on the Air* and Revlon backed the *Gertrude Lawrence Theater*. Although such prestige shows had fairly low ratings, their appeal to audiences in the higher socioeconomic brackets assured the advertiser of keeping the company name before prospective postwar purchasers and decision-makers.

6•66 Other Programs

The program darling of the late 1930s, the audience participation show, also grew in popularity during the war, because of its human interest—the entertainment value inherent in the way people behave in often-amusing situations. Art Linkletter's long-running *People Are Funny*, *Blind Date* (a program catering to soldiers and somewhat like television's *Dating Game*), a backwards quiz called *It Pays to*

Be Ignorant, and a gambler-appealing *Double or Nothing* quiz show—all began network runs. Some ran in prime time, and others began to encroach on daytime soap opera hours.

The 40 or so FM stations on the air during the war programmed orchestral music or duplicated co-owned AM station programming. FM operations generally broadcast from noon to 10 P.M. until equipment and personnel shortages led the FCC to allow a shorter schedule (see 6.22). AM-FM program duplication was very limited until the networks announced early in 1944 that an FM station could duplicate programs of its AM affiliate only if it carried *all* network programs, since the networks considered it unfair to network sponsors if only selected programs were carried. Although this cut down the amount of independent FM programming; networks, AM stations, and many FM proponents publicly argued further that only by carrying popular AM programs would FM attract and build a large audience. This argument was to be tested in the postwar years.

6•7 The Audience Tunes to Radio's War

World War II was broadcasting's first major war, and reporting the conflict made radio indispensable to the home front from 1941 to 1945. With a multicampaign war cutting across time zones, often half a world away, radio nearly always brought the first news of major events to increasing numbers of listening Americans. Newspapers provided depth and illustration, but radio nearly always delivered the scoops—frequently directly from the battlefield.

6•71 The Freeze on Receivers

The coming of war brought shortages and the meaning of "priorities" home to Americans. Within a month of Pearl Harbor, the Office of Price Administration (OPA) set price ceilings on radios and other consumer products, as a hint of stronger measures—such as rationing—yet to come. In the early months of 1942 governmental agencies examining army and navy needs for raw materials and production facilities discovered that nearly all consumer product production would have to be reduced drastically or stopped for the duration of the war. Advertisements began warning consumers of shortages ahead. Permits for new broadcast station construction were canceled in February (see 6.21), and in April the War Production Board ordered manufacturers to cease making civilian radio receivers immediately and turn full time to military communication needs. This ban originally affected only producers of AM sets but quickly spread to the fledgling FM and television receiver industries as well.

The freeze did not completely halt expansion of the radio audience at early 1942 levels. As seen in Appendix C, table 8, 31 million homes and more than 9 million automobiles had radios. More homes had radios than electricity, bathtubs, telephones, or cars. Because households with more than one receiver loaned, gave, or sold extra sets to persons without, the radio audience actually expanded during the next two years even with no new receiver construction. While car radios declined by three million during the war—most of them were junked along with the car—the number of radio homes increased by nearly four million.

Still, the overall number of receivers in service declined as older sets wore

The Attraction of the Daytime Serial

In size, the audience numbered approximately half of the women who were home during the daytime hours. In composition it included women of all cultural, economic and social levels. Among the faithful audience were many individuals whose relationship to the programs exceeded passive entertainment. For these listeners, the line between illusion and reality was too finely drawn to remain in view for an extended period of time. Whatever the level of rationalization employed, this segment of the audience did not regard the serial characters wholly as fiction. If one of the episodes involved the birth of a child the program could expect to receive not only notes of congratulations but baby gifts from all over the country. The same phenomenon occurred on the occasion of birthdays and anniversaries mentioned in any script. There were offers to loan money or to extend other assistance to destitute characters.

The primary reasons for listening, while often interrelated, can be distinguished as: (a) emotional escape from monotony, personal disappointment and difficulty; (b) provision of moral values and guidance in family and interpersonal problems; (c) bolstering of the female ego; (d) companionship and, lastly, (e) entertainment.

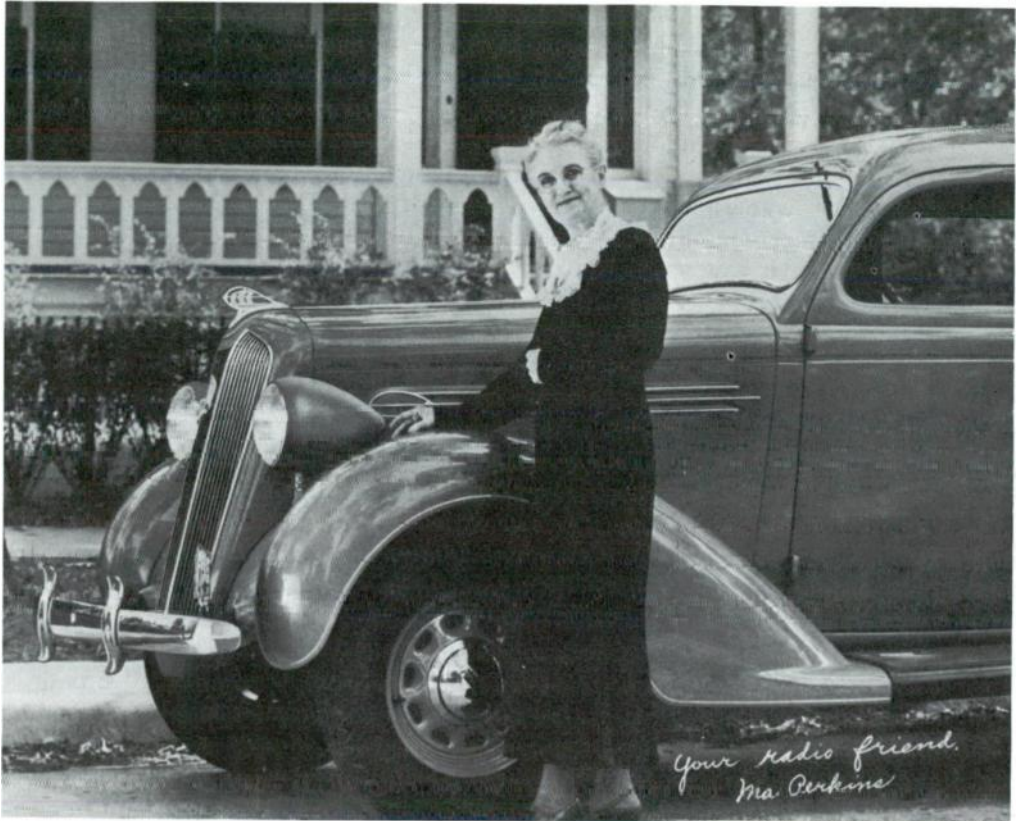
The housewife increasingly has been free to indulge in whatever diversion, real or imaginary, might lighten the drudgery of her workload and brighten her glamourless life. The convenience and accessibility of radio served for many either to create heroic fantasies or to channel existing reveries at little or no cost in time or work accomplished. At the same time the listener was exposed to a generally consistent sequence of problem-solution case studies

designed as entertainment but from which, if she so desired, the modern woman could derive sufficient strength and conviction to meet her share of personal grief. Whether or not the serials expected to function as educational or therapeutic instruments, the fact remains that nearly half of the listeners placed heavy emphasis on the guidance, inspiration and practical assistance thus afforded.

The listener's sense of security was enhanced by emphasis placed in the serials upon such matters of special interest as marriage ties, the problems encountered by career women (a role the listener had avoided), the importance attached to the role of the wife and homemaker and, in all things, the ultimate triumph of good over evil. It was not by chance that nearly all of the moral, emotional and spiritual strength was invested in the female characters.

At a more widely shared level of appreciation, the serials were enjoyed simply for the companionship provided by characters who became familiar to the listener over a period of months and years. The punctuality and dependability of the daily visits doubtlessly lent a sense of order to many a pointless day.

Source: George A. Willey, "End of an Era: The Daytime Radio Serial," *Journal of Broadcasting* 5:97-115 (Spring 1961), pages 109-110. By permission.



In their heyday, networks and advertisers sent out thousands of pictures to fans, showing the stars in costume—which, unfortunately, rarely matched listeners' imaginative expectations. This one, from the long-running soap opera *Ma Perkins* stresses the tie of serial to listener with its printed salutation, "Your radio friend . . ." Photo courtesy of the State Historical Society of Wisconsin.

out and were junked or gutted for spare parts. This trend jumped after April 1943 when the War Production Board ruled that a replacement part could be obtained only in return for the equivalent old part, which was rebuilt and recycled when possible. Even more important, radio repair became virtually impossible in 1943–1945 as the best technical personnel were in the service or working in war plants. As a result, set manufacturers by 1943–1944 were predicting a massive postwar radio replacement market.

During the war there probably were 400,000 FM receivers in use plus 10,000 television sets. It was estimated in 1945 that, while possibly 4,400 television sets existed in New York, one-quarter of them did not work. Nearly all FM and television sets were located in New England, New York, Philadelphia, Chicago, and Los Angeles but there was little for them to tune to (see 6.22 and 6.23). FM was able to provide minimal service in a few regions, but television practically closed up shop from 1942 until 1944. The war had cut off both FM and television just as their growth began.

6•72 *Wartime Radio Usage and Research*

Apart from the predictable increase in listening to news and other war-related programs, audience listening patterns did not change much during the war, even though many people's lives changed drastically, with more than 16,000,000 persons, including 200,000 women, in service during some part of the war. Restrictions on travel and other activities caused a slight increase in radio listening that had practically disappeared by 1945. With the motion picture industry producing several hundred films a year, people exhibited no

overwhelming need to turn to radio for entertainment. There were nearly always more women tuned in than men, more lower than upper income listeners, everything else being equal, and more urban than rural listeners.

Initial research into specific types of programs and listeners disclosed, among other things, that different kinds of programs had varying amounts of *holding power*—the ability of a program to keep its initial audience for the entire show. Women's serial drama managed an 85 percent holding rating (in other words, only 15 percent tuned out before the show ended) and wartime news reports 79 percent. Drama usually held three-quarters of its audience, and variety shows did nearly as well. Rated typically lower were the new audience participation and quiz shows, popular music, and, lowest of all with only 59 percent holding power, concert music programs.

Audience research developments in 1941–1945 fell into three categories: audience ratings, in-depth program research, and propaganda analysis—the last done mainly by or for the military. In 1943 the Cooperative Analysis of Broadcasting (CAB, see 4.72) was dissolved, mainly in recognition of C.E. Hooper's "Hooperratings" as the final arbiter of network radio program success. Hooper continued using his coincidental telephone technique, even though some American homes had unlisted numbers and many had no telephone. He published the best description of his research technique in 1944 with Matthew Chappell in *Radio Audience Measurement*. However, other organizations had other techniques. In New York City, The Pulse used a roster-recall method, by which a selected audience member reviewed a list (roster) of programs for a prior period of time, usually a day, and indicated those he or she had listened to. This aided recall

system could be done in person or by telephone. In the eastern states, A. C. Nielsen introduced its Nielsen Radio Index, using mechanical meters attached to radio sets, in fall 1942 (see 5.73). The meter produced a small length of film every week or so which showed to what station that radio had been tuned at a given time. The meter required no human service or interaction other than mailing the film to Nielsen, in exchange for a few quarters that came out of a slot in the meter, and inserting the new film that arrived in the mail. It worked at all hours as no other audience research technique could. The Nielsen equipment was expensive to install, the sample could not easily be changed, and people with meters might exhibit different listening habits from people without them, but the technique had promise. By the end of the war, the Nielsen Radio Index had become the first serious national competition to Hooper.

CBS backed a great deal of intensive research on programs and their audiences. Their electromechanical program-audience analyzer allowed intensive study of minute-by-minute reactions of 30 to 100 subjects to a specific program. Respondents sat in a room equipped with hand-held devices that allowed them to indicate their opinion of what they were hearing whenever a light signaled for a pro or con response. The hand devices were connected to a graphic recorder that told the researchers what moments in the program and its supporting commercials most appealed to or appalled the listeners. In this way, researchers learned what kinds of characters, language, situations, and events to put into programs and commercials to increase their appeal and audience holding power.

Researchers thoroughly examined the appeal and effects of serial soap operas, analyzing their educational aspects,

the typical program formula's ability to attract and hold listeners, and characteristics of daily serial listeners. This was the first in-depth study of a segment of the radio audience since the "War of the Worlds" research of 1938-1940. It was learned that serial listeners felt tremendously loyal to the programs, their key characters, and often the sponsors' products (a fact of considerable interest to advertisers), and believed that they learned how to solve everyday problems from what they heard, and responded differently to different serials. Most serial listeners were from lower socioeconomic groups, and most listened to several serials each day. Ironically, this companionship role of soap operas was adequately understood only as the serial form began to slip in daytime radio schedules (see 6.65).

Finally, researchers looked into the presumed effect of propaganda on military and civilian subjects. The study of German radio programs and films, and some Allied efforts in the same media, gave clues as to how persuasion took place under various audience conditions. Findings bore fruit in Allied propaganda in both Europe and the Pacific—and domestic advertisers applied many of the basic results when the research findings became available after the war.

6•8 Postwar Planning and Wartime Control

Four major regulatory developments occurred in the early 1940s: a lengthy allocation process; governmental wartime censorship; the FCC attempt to control ownership of broadcast networks and stations, with a resulting congressional investigation of the commission; and an incredible wrangle between radio broadcasters, the American Federation of

Musicians, and the federal government. Oddly enough, censorship, which one might expect to be the most controversial and sticky, became an example of successful voluntary cooperation between government and broadcasters. Real sparks flew only over other developments.

6•81 *Allocations Conflict:
Television versus FM*

As the war neared its end, in addition to hundreds of new AM station applications and requests for changes in existing stations, some 600 FM and 158 television applications to construct new facilities were piling up in the FCC's Washington offices. Some applications were frivolous, some were "insurance policies" filed by older media concerned about television competition, many were withdrawn, but most reflected a belief that radio and television broadcasting were headed for a postwar bonanza—tapping of the pent-up consumer demand of the war years. For the next decade, the struggle between services over spectrum space and channel allotments to various communities was to absorb the attentions of broadcasters, regulators, manufacturers, and politicians. The decisions of the 1944–1953 period (see also 7.8) shaped broadcasting, especially television, down to the present day.

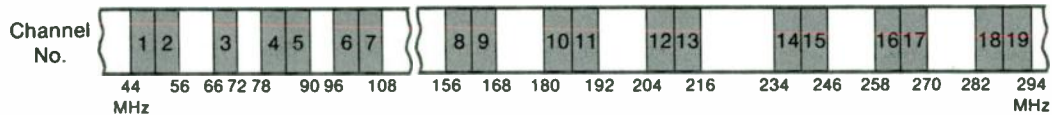
During the 1930s, as new uses for radio developed, the usable, assigned part of the spectrum was continually moved upward. By the start of World War II, the practical limit for radio use was in the neighborhood of 100 MHz. Wartime research quickly opened the region above 100 MHz to tactical communication, radar, and many other uses. As in World War I, a constant interchange of ideas and technology went on between civilian and mil-

itary engineers. Early in World War II larger manufacturing concerns realized that overcoming technical drawbacks to use of the VHF and UHF portions of the spectrum would probably be easier than overcoming political and economic objections to their use for television broadcasting and other civilian services. Some frequency bands were better than others for certain applications; for example, frequencies above 30 MHz generally were restricted to little more than the "line of sight" distance from the antenna to the horizon—50–90 miles, depending on antenna height—with the lower frequencies being somewhat better. The enormous inertia of investment in equipment, particularly home receivers, designed to operate in a particular band was another limiting factor. Technical aspects of the propagational characteristics of a given band were uppermost in the minds of engineers, but economic "realities" were uppermost in the minds of those who hired the engineers.

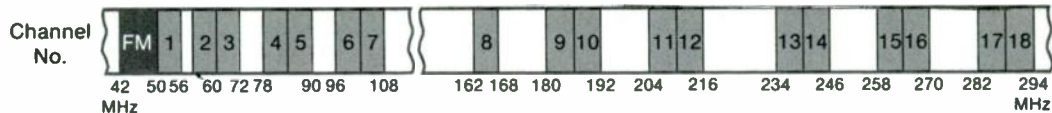
The complexity of these economic realities must be understood to perceive why certain decisions were made. At least four separate but related factors led to the 1944–1945 allocations decision climax: (1) the wartime freeze, which led to a pent-up consumer demand for new goods and services and made feasible the planning of changes long in advance of production; (2) the new international responsibilities of the United States, requiring a tremendous amount of spectrum space for the armed forces, and leadership and cooperation with the ITU and other world agencies in reestablishing allocations guidelines after the war; (3) the fight between FM radio and television for essentially the same spectrum space, since the VHF band was believed best suited to both; and (4) the television feud between those industry forces that wanted immediate postwar television and those that argued for further

The Changing Allocations for Television: 1937–1952/Though this chart covers a greater period than the chapter, the major allocation decision was made in 1945 (the third bar of the chart). Note the changing interrelationship of TV channels and FM channels. See notes.

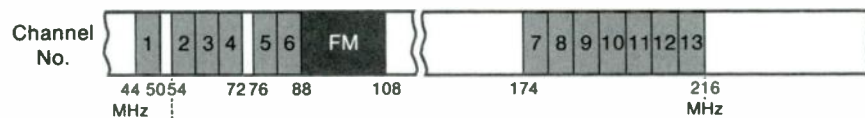
October 1937 (experimental): 19 VHF Channels*



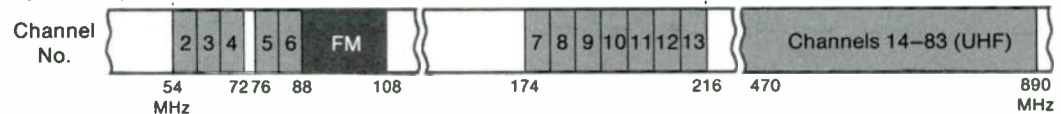
May 1940 (commercial): 18 VHF Channels



May 1945 (second commercial): 13 VHF Channels (Note: Channel 1 deleted May 1948; FM includes 106–108 MHz allocated to facsimile but not used)



April 1952 (end of Freeze): 12 VHF Channels and 70 UHF Channels (commercial and noncommercial)**



■ = TV Channels (6 MHz wide) UHF not shown to scale
 ■ = FM Channels (200 kHz wide after 1941)
 □ = Other (nonbroadcast services)

Notes:

**Earlier allocations:* There were two allocations for visual broadcasting (television) prior to those shown on the charts, but both were short-lived and little used. The first came in the October–December 1928 period, and called for 10 kHz-wide channels at the upper end of the standard (AM) broadcast band. Such channels were too narrow to work, but their nearness to existing stations and receivers on the spectrum placed them technically in familiar territory. The second allocation, issued late in 1928 and actually used for several years, was in effect until the October 1937 allocation shown on the chart. This allocation provided for five 100 kHz-wide channels at 2.0–2.2 MHz and 2.7–2.9 MHz. They were for experimental work only and, partly because of the Depression, saw little use.

***Later changes:* On May 20, 1970, the FCC removed television channels 70–83 from potential television broadcast use, applying them to land mobile needs. No on-air stations were affected, though several translators and other station assignments had to be moved. Sixty-eight television channels were left, although channel 37 (608–614 MHz) has been reserved for radio astronomy since 1963.

Source: FRC and FCC *Annual Reports*, and "Background of Frequency Modulation," in Milton B. Sleeper (ed.) *FM Radio Handbook: 1946 Edition* (Great Barrington, Mass.: FM Company, 1946), pages 3–7.

changes and improvements in standards and allocations before the postwar boom began. These economic and social problems complicated technical hearings already confused by military research findings on spectrum propagation characteristics. In addition, all parties recognized that the FRC and FCC allocation practice of the 1920s and 1930s merely to regularize existing uses and allow a service to spread out, as exemplified by AM radio (see 3.81 and 4.82), was inefficient and impractical.

The allocations hearings where all this came to a head were instigated by the international situation. The FCC had long been a member of the Interdepartmental Radio Advisory Committee (IRAC), the U.S. government body composed of major federal government *users* of the radio spectrum—the military services, FBI, Forest Service, and so forth. The FCC represented both its own limited needs and the far more important and large-scale needs of civilians, including common carrier, safety and special services, amateur, and radio and television broadcasting. In June 1943 an IRAC committee began to plan for postwar use of the spectrum, for not only had military needs mushroomed, but a plan would be needed to replace the prewar worldwide Cairo agreement of 1938. IRAC submitted a tentative plan to the FCC in the latter's capacity as a member, for the FCC has no control over federal governmental usage. The FCC, seeing the military's proposals as a naked spectrum grab, balked at approving anything until a public hearing on the issues had been held, as required by the Communications Act of 1934, since many allocation changes affected nongovernmental users. Although the Department of State announced it would use the IRAC proposals in postwar international meetings, the FCC stood ground and effectively won after not

participating in the State Department's government-industry meetings.

Late in 1943, to make use of the rapidly increasing military spectrum and propagation research findings, the FCC called on the manufacturing industry to establish a Radio Technical Planning Board (RTPB) of industry and government engineers and other technical people, to evaluate wartime data in relation to prospective postwar changes in broadcasting and other allocations. Faced by the IRAC situation, the FCC urged the RTPB to present its case or cases at an extensive public hearing in fall 1944. RTPB was divided into several panels, each of which would consider a major topic—FM, television, facsimile, allocations in general—and make recommendations at the hearings.

The hearings lasted from September 28 to November 2, 1944, the most extensive conducted by the FCC up to that time. More than 230 witnesses testified, 4,559 pages of testimony were gathered, and 543 exhibits were submitted for the record. The presentation of still-secret military data required that some sessions be held behind closed doors. One of the first issues considered was the fight between FM and television interests (see 5.1).

In 1943, during Senate Commerce Committee hearings, Edwin Armstrong pleaded in favor of allocating additional frequencies for relaying FM broadcasts around the country. By this time there were more applications than available FM channels in New York and New England, and it was apparent that this region at least would need additional channels for FM broadcasting.

By 1944, however, Armstrong was fighting to retain the channels FM already had. His fight for additional space succumbed to the pressures of the wartime spectrum propagation research and the 1944 allocations hearings. During those

hearings, the 1945 decisions, and ensuing appeals and suits, FM and television struggled for the mutually exclusive right to occupy various parts of the VHF spectrum, especially the 42–50 MHz band then occupied by 55 pioneer FM stations. This fight, lasting from 1944 through 1947, grew more and more bitter as RCA used all its large-corporation force to back television against FM and its solitary inventor. Since Armstrong, out of fairness to earlier small licensees, would not give RCA a special license to use and resell rights under Armstrong's patents, RCA resorted to other techniques, including refusal to pay Armstrong royalties due him from RCA production of television sets with FM sound. Careful review of the evidence indicates that RCA did not care much one way or the other about FM, but it was not going to let anything stand in the way of television!

Some of the 1944 testimony, concerning military advances in uses of frequencies as high as 300 MHz, was classified. Participants in the hearings had access to the data, but they could not utilize it or communicate it to their backers or the press. Consultants had to be members of the RTPB. This became important when the recommendation was made to move FM from its 42–50 MHz allocation "upstairs" to a position closer to 100 or even 120 MHz. The recommendation was based largely upon flawed classified information provided by former FCC engineer Kenneth Norton, who predicted that FM would experience serious interference on the 40–50 MHz band when the 11-year sunspot cycle reached its peak in 1947–1948. Although RTPB's Panel 5 (FM) recommended an expanded band in the 50 MHz area, the FCC, after announcing most other allocations, decided on June 27, 1945, to move FM to 88–106 MHz. A few months later it added the 106–108 MHz band pre-

viously reserved for facsimile. This new allocation for 100 channels provided 60 more than on the old band and reserved 20 of them for educational uses. The FCC never explained how television, whose picture transmissions were especially susceptible to interference, would avoid the hypothetical sunspot problem. On the other hand, Armstrong never explained how he could have a nationwide FM system with only 40 channels.

The move "upstairs" gave Armstrong more channels but at the unacceptable, to him, cost of starting over, since it made existing transmitters and receivers (perhaps 400,000) obsolete. Armstrong initiated several futile appeals to the courts, the legislative branch, and public opinion. He tried without success to make the FCC rescind its order and retain a couple of the old channels for relay purposes. His case sparked hearings in both the House and the Senate into FM and FCC allocation policies, but much recrimination failed to topple the FCC's decision. FM was trapped. The newer television service had won primary attention, and war-end demand for radio receivers was satisfied by the manufacture of AM sets. The manufacturing industry was afraid to confuse the buying public or divide the industry's priorities. Resolving the situation by ignoring FM took care of part of the problem, but the television manufacturing industry was split as well.

6•82 *Allocations Hearings and Decision*

The arguments over moving FM up to the 88–108 MHz band were but a sideshow to the main event between RCA, which wanted postwar television immediately, following "proved" standards, and CBS, which tried to delay full exploitation

of television until it had completed research on color and high definition in the upper frequencies. (The situation was analogous to the Westinghouse decision at the end of World War I to use suddenly surplus manufacturing capacity for the production of broadcasting receivers.) If there were rival products, such as television and FM, or different television standards, the resulting public confusion might force manufacturers to divert facilities to less profitable lines of merchandise. Or, if one company controlled the patents and know-how, such as RCA with its television system, then other corporations might find themselves in the cold.

As a result, toward the end of World War II, the industry was divided. To RCA's great satisfaction and profit, almost the entire manufacturing industry favored RCA's position: the immediate establishment of postwar television using prewar standards, and the postponement of potential improvements in both standards and allocations to a vague future. CBS, lacking a strong patent position in black-and-white television, wanted to promote its system of color television and steal a march on RCA. It advocated further research on monochrome and color and an allocation system able to accommodate the foreseeable expansion of television—in particular, a large number of channels in the UHF band, with only temporary assignments on VHF. CBS asserted that delaying the innovation of higher-definition or color television would freeze the television system into the technical standards and allocation mold of 1941. The public had invested \$2 million in receivers by 1944, but this was nothing compared to the hundreds of millions of dollars that it was expected to spend on television within two years of the war's end. CBS management and engineering witnesses called attention to the expensive military research

on the UHF band during the war and the possibility of its leading to a practical high-band color television system within a year—if everybody worked on it.

To gain manufacturing allies in its fight against RCA, as well as to show genuine interest in UHF, CBS ordered a UHF transmitter from General Electric and cooperated in the development of UHF receivers with Zenith, but it received little support before the FCC. The CBS system—which promised far better quality of both black-and-white and color picture than we now have—would require complete redesign of receivers to permit them to operate on the UHF band with a bandwidth of 16 MHz. Eventually, CBS managed to fit its color system, but not the proposed high-definition monochrome system, within a 6 MHz standard channel. Supporters of “television now” attacked CBS for trying to marshal public and industry support, while WCBS-TV repeatedly announced that its broadcasts were not inducements to buy television sets “at this time.” Resentful of its proposal to abandon the VHF band and all previous planning, they accused CBS of trying to hamstring television because of its investment in AM broadcasting and its lack of a manufacturing subsidiary to profit from the sale of television sets, and of trying to strengthen its own position while posing as a champion of science. Although many of these charges were valid, the opposition could not destroy the basic soundness of the CBS call for extensive serious planning for technical quality, the most logical allocations scheme, and the greatest amount of competition.

The lineup of opponents to CBS was formidable. As soon as the war ended, most electronics manufacturers would have excess plant capacity and some factories built with government money would be ready for purchase and conversion to tele-

vision-receiver production based on prewar technical standards. The introduction of new standards would require tooling up, and the delay might cause producers of black-and-white television to miss out on profits from the expected postwar surge of buying. In addition to RCA, manufacturers, broadcasters, and individuals who feared postwar unemployment and were looking for new industries to take up the slack all opposed these CBS proposals. They were joined by such bodies as the just formed Television Broadcasters Association.

Perhaps the greatest handicap of CBS was that it was moving counter to the demand for consumer goods. Its argument that postwar demand for radio and phonograph equipment could keep them busy while they engineered a new television system failed to convince an industry—and a country—impatient for glittering new services. People felt that the available television system should be exploited to the fullest, regardless of its shortcomings.

These shortcomings, generally recognized, included the psychological barrier that establishing television on VHF would create to changing the system later to UHF, and the existing allowance of too few channels for a nationwide, competitive television system. RCA, ignoring the lessons of television's false start in 1940, Dumont, and others believed that it was better to get started immediately on VHF and trust that future problems could be met with equanimity.

The most important support for the RCA position came from the RTPB Television Panel. It recommended at the hearings that television could and should be established in black-and-white, on 6 MHz channels on VHF frequencies. It suggested that 30 contiguous channels on the VHF band would be sufficient. On reviewing the latter proposal, the RTPB's Allo-

cations Panel badly mangled it by recommending 26 channels, divided into seven segments rather than one continuous band. All were to be in VHF, with nine below 108 MHz. The three uppermost channels were for *local* or *community* station use, with low power and antenna, and would probably be needed only along the densely populated Atlantic seaboard. The RTPB Allocations Panel also suggested providing some 30 additional channels, each 20 MHz wide, for experimentation and future development.

Although the knowledge did not stop pressure for immediate activation of 15 or so channels, virtually all parties testifying at the FCC hearings agreed that at least 25 to 50 channels would be needed eventually and that their most logical location would be in the UHF. But, as a Philco executive put it, "There is no good reason why the public should not enjoy our present television while . . . research is going on." The rebuttal, by soon-to-resign FCC Chairman Fly, was disregarded: "I am rather regretful to see editorials talking about the necessity of freezing television at the prewar standards because there were 7,000 receivers in the market and in the hands of consumers. . . . If we are going to have that cry with 7,000 receivers we will never change [the system] basically . . . when the quantity of receivers may run into millions. . . ."

It would be hard to overemphasize the importance of the 1945 decisions that stemmed from these hearings. Much of their structure remains, and they are the source of many of today's problems. The January 15, 1945 report of the commission proposed assigning television only 12 VHF channels (six between 44 and 80 MHz, six between 180 and 216 MHz) as compared to the 25 or 30 proposed by the RTPB panels. Channels allocated to television in 1940 were permanently lost to military and

other governmental uses. Spectrum space was so short that 11 of the 12 channels would have to be shared with government and nongovernment fixed and mobile services on a geographical mutual noninterference basis. The scheme did allow enough space for a maximum of seven stations in a given city but not enough for nationwide competitive service.

After further hearings and oral briefs early in 1945, including more classified testimony from military witnesses, the FCC issued its Final Reports on May 25 and June 27, 1945. Television received another channel near the high end of the VHF (174–180 MHz), and FM (see 6.81) was definitely moved up to 88–108 MHz, freeing the old FM band (44–50 MHz) for television's channel 1 as proposed earlier.

The June 27 report had four extremely serious drawbacks: (1) It required television to share channels with fixed and mobile services, a dangerous practice for a service highly susceptible to interference. (2) In discarding the engineering criterion of a continuous band of channels, it increased the cost of sets by requiring expensive switches that would cover four bands over a range of 172 MHz (from the bottom of Channel 1, at 44 MHz, to the highest part of Channel 13 at 216 MHz) rather than continuous tuning over only 78 MHz (13 channels at 6 MHz each). (3) It rendered the FM investment obsolete and delayed the start of postwar FM on a frequency band considered by many less suitable than its previous band. (4) And most important, it authorized full-fledged exploitation of television on an inadequate number of channels. The FCC decision to use the thirteen VHF channels was separate from its decision to reject CBS proposals for wide-band color television on the UHF band. Commission and industry unanimously agreed that thirteen channels were too few for nationwide, com-

petitive service. No provision for alleviating the situation was made other than labeling some channels on the UHF band "experimental," although the FCC spoke of VHF as "temporary," with UHF the future "home" for television. In an ostensible effort to free television from its wartime fetters and speed its progress, the FCC actually bound the new service in a straightjacket.

Faced with the weight of opinion that RCA and its allies mustered, the FCC could not have done other than establish postwar television with prewar transmission and definition standards. RCA had worked *within* the industry to achieve its goals. As will be seen, RCA reaped the benefits from the tremendously rapid expansion of television service by selling sets and taking in huge patent royalties. Still working on its own color system, RCA fostered a "don't rock the boat" attitude in the industry with respect to color. The resulting FCC rejection of CBS's color and wide-band proposals encouraged expansion of black-and-white television service. The FCC, apparently eager to place its imprimatur on the winning side, approved.

6•83 *The Petrillo Affair*

In June 1940 James Caesar Petrillo, president of the Chicago local, was elected national president of the American Federation of Musicians. Soon afterward he demanded that broadcasters playing recorded music pay fees through the union, in addition to those paid to ASCAP and other performing rights societies (see 5.85) and "stand-by" fees paid to musicians by the networks since 1937, whenever they used recorded music more than once. When Petrillo's negotiations with the networks broke down in June 1942, he announced a complete ban on recording—

both for home use and broadcasting as of August, depending on public demand for music to pressure the record companies and networks to pay graduated fees directly to the union.

Petrillo struck what many considered a low blow in 1943 when he banned the traditional NBC broadcasts from the Interlochen, Michigan, Music Camp because the student musicians were not members of AFM, although many of their teachers were. The union barred the teachers from working at Interlochen, although the camp's director gave up his union membership in protest. Petrillo made the Interlochen ban stick under threat of a national AFM strike banning the performance of all kinds of music.

In summer 1943 Petrillo was asked to lift the recording ban on grounds of "national morale"—at least insofar as it affected music heard by the fighting forces. After Petrillo ignored these requests, the National War Labor Board ordered the AFM ban lifted in mid-1944, but the union stood fast. Even a plea from the President in October 1944 could not move Petrillo. The ban on recording broke down only when Decca Records and WOR in September 1943 and then Columbia and RCA in November 1944 gave in to AFM demands.

In spring 1944 Petrillo started a campaign to employ AFM members as *platter turners* (technicians who actually put records on turntables) in radio stations, and in February 1945 he ran out his next big gun, aimed at broadcasters alone. He ordered AFM musicians to refrain from playing for FM, which in the war years often rebroadcast AM programming, unless the parent AM stations hired duplicate stand-by orchestras of AFM members. No television work was permitted, pending further study. That battle would peak after the war, even though Petrillo successfully withstood outraged public opinion and

even a new law—the Lea Act, which forbade "featherbedding" and union "coercion"—designed to curb his power in 1946 (see 7.85).

Petrillo's muscle-flexing was a hint of rising union strength in the ranks of broadcast and broadcast-related employees. As the industry grew far beyond its wartime size after 1945, unionization became increasingly important (see 9.3). Foreshadowing jurisdictional disputes to come was a battle between the AFM and the National Association of Broadcast Engineers and Technicians (NABET) over control of the men who turned discs over on the turntables at radio stations. In Chicago, Petrillo's home town, the AFM won, but the technicians' unions won in other large markets while smaller towns were less unionized.

6•84 *Office of Censorship*

The first post-Pearl Harbor attempt to control what radio stations might say about the war effort came from the National Association of Broadcasters. Shortly after December 7, 1941, the NAB issued a list of 16 "do nots" to guide news reporters away from disseminating information of possible value to the enemy. Soon after, the government set up the Office of Censorship, under former newspaperman Byron Price, to oversee communications inside the United States. The office, operating under the premise that "what does not concern the war does not concern censorship," worked for voluntary cooperation of the various media. To secure industry cooperation and obtain the services of industry experts, it set up a broadcast division under direction of a radio station executive. Most NAB rules soon were made official. In its first version on January 15, 1942, the "Code of Wartime Practices for

American Broadcasters" noted that censorship was voluntary and that broadcast management was responsible for finding potentially dangerous material in news programming, other programs, and commercial copy. Broadcasters controlled most programs voluntarily by spot checking and submitted a few—news commentary by Drew Pearson and *The March of Time* on Blue, and *We, the People* on CBS—for formal prebroadcast censorship. This code, revised in May 1942 and again in December 1943, contained many "suggested" restrictions:

Broadcast no information on specific military units, installations, or disposition of enemy prisoners in the United States.

In the event of an enemy attack, make no reports of damage inflicted—and no indication of an attack until it is over.

Do not identify by name persons injured or killed in battle until the military authorities have indicated they have notified next of kin.

Supervise musical request programs and "any program which permits the public accessibility to an open microphone is dangerous." This usually meant banning man-on-the-street interviews for fear that an agent could convey a message to the enemy through an innocent-sounding song or combination of words.

Do not accept public service announcements by telephone; they must be in writing from a known source.

Broadcast only foreign language programs that are accompanied by full English-language scripts for checking.

Ban weather forecasts; knowledge of wind direction or barometric pressure would be vital to an enemy bombing attack.

The 127 foreign language stations, broadcasting in 30 different foreign languages, offered a special problem. Stations broadcasting German or Italian programs were

carefully investigated, and the Office of Censorship required them both to hire a linguist to check program content and to file translations of their programs. These expensive requirements forced many stations to drop foreign language broadcasts, just as World War I had helped diminish the foreign language newspaper in America.

Media people feared the tendency of bureaucracy to get too large and costly. They recalled the World War I efforts of the government to censor through the Creel Committee on Public Information, which many believed to have cut too deeply into film and the press. But the voluntary controls administered by the Office of Censorship seem to have worked well and with little controversy. There was common recognition of what was needed, and common resolve to accomplish it with the least conflict.

6•85 *The FCC Investigates . . .*

Cooperation is not a word to describe wartime activities of the FCC. The strongly held views of Chairman James Lawrence Fly—the first chairman to have the ear of the President—did not agree with those of most broadcasters and, as it turned out, many congressmen. Most of the commission's activities had little to do with the war, owing to the authority of the War Production Board, the Office of War Information, and the Office of Censorship. The FCC monitored enemy broadcasts, kept watch for unauthorized transmissions, and continued investigating station and network ownership.

The proposed chain broadcasting regulations of May 1941 (see 5.83) entailed the FCC in much legal wrangling. In January 1942, the Federal District Court for the Southern District of New York ruled that it had no jurisdiction to act on the

NBC-CBS suit against promulgation of the proposed FCC rules. That same month, the Justice Department filed antitrust suits against CBS and NBC-RCA. That action, backed by the Mutual network, forced the major networks to appeal to the U.S. Supreme Court, which agreed in June 1942 to review the chain regulations. Its decision of May 10, 1943, was one of the legal landmarks in broadcasting history. In *NBC v. the United States*, the court, by a vote of 5-to-2, not only upheld the FCC's right to enforce the chain broadcasting regulations but also reinforced its rights under the Communications Act of 1934 to act in its best judgment under the "public interest, convenience, or necessity" rubric. The court held that regulation and selection of

licensees was within the jurisdiction of the FCC as assigned by Congress, and that such regulations did not conflict, as the networks had claimed, with the First Amendment. This was the most important upholding to date of the FCC's powers. NBC reluctantly shed the Blue Network (see 6.3), and in October the government and Mutual withdrew the antitrust suits against NBC and CBS, having accomplished their purposes. The new FCC regulations went into effect in mid-1943, leading to the sale of some stations in cities where one licensee had owned more than one station, and to the long, difficult, physical and financial untangling of the Red and the Blue networks.

FCC investigation of newspaper

A Landmark Supreme Court Decision: 1943

The Act [of 1934] itself establishes that the Commission's powers are not limited to the engineering and technical aspects of regulation of radio communication. Yet we are asked to regard the Commission as a kind of traffic officer, policing the wave lengths to prevent stations from interfering with each other. But the Act does not restrict the Commission merely to supervision of the traffic. It puts upon the Commission the burden of determining the composition of that traffic.

While Congress did not give the Commission unfettered discretion to regulate all phases of the radio industry, it did not frustrate the purposes for which the Communications Act of 1934 was brought into being by attempting an itemized catalogue of the specific manifestations of the general problems for the solution of which it was establishing a regulatory agency. That would have stereotyped the powers of the Commission to specific details in regulat-

ing a field of enterprise the dominant characteristic of which was the rapid pace of its unfolding.

The question here is simply whether the Commission, by announcing that it will refuse licenses to persons who engage in specified network practices (a basis for choice which we hold is comprehended within the statutory criterion of "public interest"), is thereby denying such persons the constitutional right of free speech. . . . The licensing system established by Congress in the . . . Act of 1934 was a proper exercise of its power over commerce. The standard it provided for the licensing of stations was the "public interest, convenience, or necessity." Denial of a station license on that ground, if valid under the Act, is not a denial of free speech.

Source: *National Broadcasting Co., Inc. et al. v. United States et al.* 319 U.S. 190 at 215-216, 219, and 226-227 (May 10, 1943); the opinion written by Mr. Justice Felix Frankfurter.

ownership of radio stations also dragged on during the war. Begun in summer 1941, the hearings continued on and off until January 1944, when the commission "concluded, in the light of the record of this proceeding, and of the grave legal and policy questions involved, not to adopt any general rule with respect to newspaper ownership of radio stations." The commission submitted the results of its hearings to the interested congressional committees and decided to face the issue case by case instead of making rules. Nor did this end the matter; both the Justice Department and the FCC were still working on newspaper-broadcasting station joint ownership divestiture in the 1970s.

6•86 . . . and Is Investigated

During the early 1940s the FCC was more the subject than the instigator of investigation. In 1940 RCA pushed a Senate investigation of the FCC after Chairman Fly forestalled RCA's plan to inaugurate commercial television with inadequate technical standards (see 5.15). For years disgruntled parts of the industry and critical members of the House and Senate had sought congressional investigation of the FCC, especially for alleged inaction on monopolistic control of broadcasting. While its chain broadcasting investigation helped allay some of the concern that the FCC did not go far enough in promoting the public interest, many thought that the commission had gone too far, including in 1942 congressmen, constituent broadcasters, and newspaper publishers. Leadership of the anti-FCC group fell, however, on Georgia Congressman Eugene E. Cox—ironically a former supporter of the commission—for reasons that were less savory than the economic conservatism of many senators

and representatives. The FCC had reported to the Department of Justice that Cox had illegally received payments from a Georgia station for representing that station's views before the FCC. Early in 1943 Cox pressured the House Speaker to appoint a five-man committee to investigate the FCC. Naturally, as proposer of the resolution, Cox became chairman of the committee!

The hearings, beginning in mid-1943, were not friendly. At the first session the FCC's general counsel was threatened with expulsion from the room for trying to speak to the committee. Cox and most of his fellow committeemen complained that the FCC had delved into programming and business aspects of broadcasting beyond its prerogatives, played political favorites in official actions, and entered wartime fields properly the army and navy's. They charged that Chairman Fly dominated the commission and helped his friends get station licenses. They said that the FCC was unpatriotic, in failing to implement a proposal to fingerprint radio operators; that it operated its monitoring service inadequately and drew manpower for it from military needs; and that it harbored potential subversives. They said that the FCC spent too much time and attention on broadcasting and neglected telephone and telegraph problems. The hearings dragged on for months, even with the resignation from the committee of chairman Cox, two general counsels (the second of whom, John J. Sirica, became the federal judge who presided over the Watergate break-in trial in the early 1970s), and most of the staff. With President Roosevelt's support of Fly and the personal nature of some of the charges, it was not surprising that the hearings had few results other than some FCC personnel changes, some specific findings that led to proposals to amend the 1934 Communi-

cations Act, and a mound of paper. Chairman Fly resigned early in 1944, Commissioner Payne was not reappointed, and Commissioner Craven declined renomination, although he returned to the FCC in the mid-1950s. In retrospect, the whole investigation may have been an exercise. But it made the commission even more cautious and responsive to congressional wishes and whims and taught Congress the publicity value of an FCC investigation, insuring that commissioners would be familiar with Capitol hearing rooms in years to come.

6•9 Radio in a World at War

Of all the wars of this century, radio had its greatest impact in World War II. Wireless had limited use in World War I, before broadcasting developed. Television was making strong inroads into radio's audience by the Korean War of the 1950s and had become dominant by the Vietnam War. Radio was effective in three ways during the 1939–1945 war: as a non-broadcasting aid to military tactics and strategy, enabling unprecedented coordination of air, sea, and ground forces; as a source of domestic information and entertainment (see 6.61); and as a medium for international propaganda (see 6.92).

6•91 *Domestic Effects on Other Media*

Radio helped tie the country together during the dark years of 1942–1943, when we “hung on” while our war machine geared for maximum effort, and the brighter 1944–1945 period, when we knew the enemy had to give in. Radio news reported the war at home and abroad, delivering more news to more citizens than any

combination of print and film media. Radio's unique impact came from its mixture of programming-as-before combined with greatly increased news, news features, and commentary. Radio could entertain and inform the public faster and better than other means.

One reason for radio's success was the effect of the war on other media. Short supplies and poor quality of paper for newspapers and magazines helped push many advertisers to radio. Some newsprint went for comic books, which had their high point of readership in these years. Born in the mid-1930s, the comic book followed American fighting men around the world, often telling adventures of characters first heard on radio. The paperback book also bloomed during the war. If soldiers were not reading comics or listening to Armed Forces Radio, they were often reading paperback fiction, which took up less shipping space than hardbacks.

Hollywood went to war as much as radio. The stereotypical brutal German Nazi and sadistic “Jap” or “Nip” plied their evil ways on the screen even before we entered the war. Serial film characters turned their attention from fictional criminals to the Axis, in an orgy of entertainment propaganda. Perhaps more important to the morale of fighting men, many Hollywood stars went on the USO circuits, setting an example for radio and stage personalities. Military personnel around the world viewed Hollywood films, in a good example of distribution and exhibition under difficult conditions. As did radio creative personnel, many filmmakers lent their talents to the government for the duration; some, like Frank Capra, who directed the *Why We Fight* film series, worked in the service as professionals. Members of both industries, of course, joined the armed forces in other capacities and many saw combat.

The popular music business, at the height of the big band era when the war began, was hit hard in April 1942, when the War Production Board cut shellac supplies for records to 30 percent of 1941 consumption. The material was needed for wartime use, and its scarcity drastically reduced record output for several years. Not affected were most broadcast transcriptions, which already were recorded on vinyl, the plastic material from which all records soon would be made. The AFM recording ban discussed in 6.83 also reduced record industry output.

6•92 *American Broadcasting Overseas*

Overseas broadcasting by the United States took two forms: broadcasts intended for American troops abroad, and the fledgling propaganda efforts of the *Voice of America*. Troop broadcasting started out with a temporary, low-power unauthorized transmitter in Alaska, which tried to bring domestic radio fare to soldiers in one of the most physically demanding theaters of war. Army brass who discovered this operation recognized its potential value to morale. An attempt was made to meet this need through shortwave. However, because such facilities already were overtaxed, the Armed Forces Radio Service (AFRS) turned to regular medium-wave transmissions of two kinds: large, permanent stations at major bases and smaller, low-power temporary units that could follow an army on short notice. The military either climatized and issued receivers or, where troops were stationed in one location for a while, obtained some by purchase or, in occupied territory, by "moonlight requisition."

Frequently AFRS ran into difficul-

ties with technical matters, overly zealous censors, publicity-hungry senior officers, and the sensibilities of nations in which troops and AFRS might be stationed. AFRS stations primarily programmed domestic network radio fare: the programs minus the commercials, plus music recordings and a heavy dose of news. The Armed Forces Network (AFN) appeared in England in mid-1943 and soon operated more than 50 low-power stations on bases throughout the United Kingdom. After D-Day, shortwave relays delivered broadcast material to forces in France. The 20-hour AFN broadcast day contained regular AFRS fare, orientation programs, and public service announcements. AFN and AFRS programs had a minor propaganda effect on civilians around the bases, who trusted the news "that the Americans tell themselves" more than the output of overt psychological or political warfare outlets.

Our strategic overseas effort was the Voice of America (VOA). The government began production of radio programs in January 1942 and first applied the name "Voice of America" to the programming in February. From its start, VOA broadcast in a variety of languages to several parts of the world—broadcasts were carried on privately owned shortwave stations in this country, which the government took over for the duration late in 1942, or on new government-owned transmitters. After its formation in mid-1942 (see 6.61), OWI became responsible for VOA and rapidly built up a worldwide production and broadcast operation. By the end of the war, VOA had major production centers in New York and San Francisco, with more than 1,000 programs a week coming from New York alone. Programming consisted mainly of music, with news, commentary, entertainment programs from domestic radio, and programs specially designed for VOA

broadcasts, often using well-known radio characters.

6•93 *Axis Radio Propaganda*

Starting in the late 1930s, the Rockefeller Foundation funded a shortwave listening project at Princeton University to monitor and translate German, Italian, Japanese, and other foreign broadcasts. In March 1941 the U.S. government assumed responsibility for the work when it created the Foreign Broadcast Intelligence Service (FBIS)—later the Foreign Broadcast Information Service—as a function of the FCC. The service regularly published summaries and digests of broadcasts, and recordings of some of the more important ones. In operation 24 hours a day, seven days a week, FBIS covered the world, receiving more than 1½ million words a day in late 1942 and 2½ million words a day by 1944. The FBIS continued after the war as part of the CIA and still issues respected summaries of Soviet, Chinese, and other foreign broadcasts.

The domestic audience for foreign broadcasting was quite small; perhaps 5 percent or 10 percent of the total population had and used shortwave listening equipment, typically as an “additional feature” on larger console and table model radios. It was estimated that 150,000 Americans tuned directly to generally English-language broadcasts from Germany, with fewer hearing Italian or Japanese transmissions.

German international radio broadcasting came under the Ministry of Enlightenment and Propaganda headed by Dr. Joseph Goebbels, a “natural” propagandist and one of Hitler’s closest advisers. German radio transmitted to the world at large and to countries that were specific

military targets. Broadcasts of the first type stressed the correctness of the German position on world issues, the fine life inside Nazi Germany, and the heroic exploits of German arms. The second kind created a climate of fear and fomented internal strife in the target country by stressing German military strength and supporting the rights of dissident or minority groups, particularly those of German origin. One of Goebbels’ most famous, or infamous, radio personalities was “Lord Haw Haw,” the microphone name for British turncoat William Joyce, who broadcast to the British Isles for the Nazis starting in 1939. His nickname came from his affected upperclass-English style. Joyce failed to sway his audience, however, for the British laughed at him even as he advised them of locations for upcoming bombing raids. Later in the war, Berlin transmitted “Axis Sally,” an Ohio woman named Mildred Gillars, who tried to destroy the morale of the Allied forces by playing big band music and messages of impending doom. The soldiers usually listened to the music and ignored the message. At the end of the war, the British captured Joyce and hanged him as a traitor. American authorities tried Gillars and imprisoned her until 1961.

The Italians seemed to follow Germany’s example, but without success. In addition to Mussolini’s, the most famous voice used by Italy for overseas broadcasts to the United States belonged to American expatriate poet Ezra Pound. Pound declaimed the wonders of Fascist Italy and the damnation of the democracies fighting it. The Americans captured Pound, but committed him to a mental hospital for a number of years as unfit to stand trial.

The primary mission of Japanese overseas broadcasts during World War II was to convince fellow Asians of the inev-

itability and benefit of the “Greater East Asia Co-Prosperity Sphere” being built with the force of Japanese arms. For the American fighting men in the Pacific, Japanese broadcasting primarily meant Tokyo Rose (Iva Ikuko Toguri and others), who played band records and offered them a broadcast soft shoulder, telling them that, while they were fighting, other men were wooing their wives and sweethearts at home. Although the music was popular—one story claims that we parachuted new recordings on Tokyo to replace the old, scratchy ones (but the new batch all broke on landing)—the propaganda was largely ignored. The Americans captured and fined Toguri and sent her to prison. She later worked in Chicago while hoping for a pardon—finally granted in 1977.

Allied nations also broadcast beyond their borders, especially the British. The BBC was the main Allied voice heard in Europe for four long years, after Germany had conquered most of the continent early in 1940. It provided balanced news and comment and, increasingly, coded messages to specific resistance groups to coordinate guerrilla action with Allied military forces. Much of the advance work prior to D-Day was accomplished in this way. The BBC’s “World Service” newscasts probably had the highest credibility of any nondomestic broadcasting service in the world.

To the listener, American broadcasting during World War II changed only in respect to increased war-related content and the freezing of physical growth. However, as in World War I, the prospect of change, particularly in television, was enormous. The demand for consumer goods, the possible postwar uses for electronic war matériel factories, the GIs’ new skills in electronics and broadcasting, peacetime use of new leisure—all were crying for action. However, many key

questions were put off until after the war even though, as will be seen in the following chapters, the answers turned out to be not readily available.

6•94 *Period Overview*

Although the war cramped radio, like the rest of the nation, in respect to personnel and material supplies, these were some of radio’s best years in respect to economic success and public esteem. Radio’s wartime news role was indispensable. The artificially low number of stations, held nearly constant due to the construction freeze, shared in a feast of wartime advertising income while other media suffered from paper shortages. With potential competition from FM and television also held back by the war, the AM network-dominated radio establishment reached its zenith.

Apart from that economic fact, the war years are important for the groundwork they contributed to postwar changes. A fourth national network, now ABC, resulted from the chain broadcasting rules and the 1943 Supreme Court case upholding the FCC. This court decision became a precedent for future FCC regulatory incursions into various aspects of the industry. While they achieved little public recognition and only limited discussion within much of the industry, the 1944 allocations hearings set the stage for television’s postwar dominance (see 7.13, 7.8) and FM radio’s birth and temporary decline (see 7.22). The issues, complicated in themselves, were made more so by wartime secrecy requirements. While the future was being set, the public took more notice of the less important Petrillo affair and the politically charged Cox hearings into the FCC.

The war years are best described as a profitable hiatus in the continuing de-

velopment of American broadcasting. The war had global importance, and radio, apart from its important reportorial role, took a back seat for the duration together with most other civilian goods. But, as in the Depression, radio remained available to most of the public and served an important information and entertainment function.

Further Reading

Barnouw (1968) provides an overview of radio's domestic and foreign role during the war, while Lichty and Topping (1975) includes many useful contemporary accounts. Kirby and Harris (1947) offer an informal analysis of radio in the war effort. Sevareid (1946), Kaltenborn (1950), Ken-

Key Broadcasting Indicators: 1945 / This is the fourth of ten tables offering comparable information for a 50-year period (to 1975), presented at five-year intervals. Sources for items 1–6 and 11 are the tables in Appendix C, while other information comes from sources indicated. This is the first table in the series to include information on FM and television, whose commercial operation was approved in 1941. Most data are for January 1.

Indicators	AM	FM	TV
1. Number of commercial stations	881	48	8
2. Number of noncommercial stations	38	8	—
3. Total stations on the air	919	52	8
4. Number of network-affiliated stations	874	na	na
5. Percentage of commercial stations affiliated with networks	95%	na	na
6. Total industry revenue (add 000,000)	\$424.0	na	na
7. One-hour station rate (New York)	\$1,200	na	na
8. One-minute station rate (New York)	na	na	na
9. One-hour network rate, evening	\$18,500	na	na
10. Number of broadcasting employees	.....	37,800	.....
11. Percentage of families with sets	88%	na	.01%
12. Broadcasting regulatory budget (FCC)	.....	\$6,213,343	.....
13. Total FCC personnel	.....	1,513	.....

Notes (see Appendix D for full citations)

na = not applicable or not available.

2. Educational television allocations were not approved until 1952.
4. Many FM stations were network affiliates through their AM sister stations, but there are no clear records on this. Likewise, while many of the few television stations were network owned, the television networks had not yet been formed.
5. See note 4.
7. For WEAf, the NBC flagship station name in New York, soon changed to WNBC.
9. NBC radio network with 150 affiliates.
10. The average weekly salary for those employees was \$60.05; minimum wage was 25¢ an hour. Lichty and Topping (1975), page 290, table 23.
- 12–13. FCC budget for fiscal year 1945; of the total, \$4.2 million was for war-related activities.

drick (1969), and many other volumes by reporters detail wartime experiences and radio's methods of finding stories. Two small paperbacks issued by CBS (1945) provide transcripts of actual reports from war theaters and describe well how they sounded on the home front. A postwar textbook by CBS news director Paul White (1947) includes a fine chapter on radio's reporting of D-Day in Europe. For one network's role in the war, see NBC (1944), while Bulman (1945) details the professional lives of major wartime correspondents and radio commentators. For other sources on radio programming, see the books discussed at the end of Chapter 5 and Dryer's collection (1942) on radio in wartime.

Kate Smith's 1944 War Bond drive and how it succeeded as radio-borne mass persuasion is the subject of Merton (1946), while the Chappell and Hooper volume (1944) mentioned in the text is the best description of radio research immediately prior to television.

For material on regulatory issues discussed here, see the sources noted after Chapter 5, especially the FCC *Annual Reports* and *Report on Chain Broadcasting*, as well as Robinson (1943). Good material on the Petrillo affair is found in Warner (1953) and Llewellyn White (1947).

Material on the international propaganda role of radio abounds. A fine study of the BBC during the war, easily the definitive analysis, is Briggs (1970). A special study of BBC overseas broadcasts to occupied Europe is the focus of Bennett (1966). A popular analysis of radio propaganda by Allied and Axis countries is found in Rolo (1942) and Huth (1942) as well as Childs and Whitton (1942). For material on William Joyce, see Cole (1964). A recent analysis of radio as an instrument of propaganda and intelligence, with useful discussions of its development, is found in Hale (1975).

Era of
Great Change
(1945–1952)



“Television was already conducting itself provocatively, trying to get radio to pucker up for the kiss of death. Young men with crew cuts were dragging TV cameras into the studios and crowding the old radio actors out into the halls.”—Comedian Fred Allen in Treadmill to Oblivion





Era of
Great Change
(1945–1952)



“In New York City, a considerable degree of specialization on the part of particular [radio] stations has already arisen—one station featuring a preponderance of classical music, another a preponderance of dance music, etc. With the larger number of stations which FM will make possible, such specialization may arise in other cities.”—FCC, Public Service Responsibility of Broadcast Licensees (1946)

The seven years from late 1945 to early 1952 mark the transition of American broadcasting from a small radio system dominated by four networks to a far larger AM–FM radio and television system in which networks concentrated on television and left radio stations to their own programming resources. A reader only familiar with today’s broadcasting would hardly recognize the limited system of 1945, while the 1952 system contained all the elements to be found a quarter-century later.

This same short period also marked a massive change in American life. By the fall of 1945, World War II was over and the United States had become the most prominent country in the world. Confusion

Outline:

Era of Great Change (1945–1952)

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and expectation accompanied the end of wartime rationing and shortages and the implementing of plans for postwar consumption. Military personnel flooding home, though obviously welcome, clogged an overcrowded and changing employment market, and put an additional strain on inadequate amounts of housing. Millions of war-delayed marriages were celebrated and consummated, leading to the baby boom of the late 1940s and a demographic bulge down through the years. The G.I. Bill of Rights provided financing for hundreds of thousands of veterans to go to college. One industry after another endured union-management arguments and strikes. Every industry or service was in transition, particularly transportation.

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Postwar inflation was fierce. The Hollywood motion picture industry almost succumbed to an important court case, a debilitating search for communist influences, and, finally, competition with an upstart: television.

The United States was also caught in international transition from 1945, when we dominated a world at relative peace, to 1952, when we were in a shooting war in Korea and a deepening cold war with the Soviet Union, a newly communist China, and a slowly expanding "third world" of newly independent nations attempting to maneuver between and manipulate both sides. The cold war almost reached the flash point in the 1948–1949 Berlin Airlift, by which the Western allies provided all of West Berlin's needs when the Russians cut off ground access. The war in Korea, which started in June 1950, found American troops fighting a major war in Asia, although the world was not plunged into total war and the participants limited the weaponry used. As will be seen, all of this affected broadcasting.

The important changes in radio and television resulted from the FCC technical investigations and rulemaking proceedings discussed in 6.8 and 7.8. A lengthy and at times bitter debate on broadcasting's public service responsibility in the FCC, both houses of Congress, and the courts indicated additional change. FM radio and television were being built on the profits of AM radio, which itself experienced a 59 percent growth in income and 156 percent growth in number of stations between 1944 and 1952 (see Appendix C, tables 1 and 4). The relatively small "club" was rapidly becoming a major industry employing many people and having a great variety of problems. The radio audience in any one locality listened to familiar programming but sensed the imminence of television, which only one per-

son in ten had seen by mid-1948. And its coming hit people with the same feelings of expectation and excitement that the original radio audiences had felt in the early 1920s.

7•1 Technical Innovations: High Fidelity and Television

Generally speaking, the public has taken little notice of technical controversies. But, in the 1945–1952 period, large corporations vying for a vast potential market in improved phonograph records drew considerable public attention. At the same time, magnetic tape recordings entered the home entertainment market, several years after the professional broadcasting industry had adopted simpler models. More sophisticated technology—notably the transistor, invented in 1948—was still in the laboratory, as industry wrangled over standards for recording and television.

7•11 *Battle of the Speeds*

For nearly fifty years, the 78-rpm record had been a mainstay of home entertainment and broadcast music. Many stations also used 15-inch or 16-inch 33 $\frac{1}{3}$ -rpm electrical transcriptions for syndicated 15-minute programs but still had to depend on commercially available 78s for much of their daily musical programming. The 78 had many drawbacks: it was heavy and breakable; sound quality was mediocre; any musical selection that ran longer than four or five minutes took two, three, or more records; but most importantly, the constant need to change and turn records marred the appreciation of any extended piece of music. In an attempt to overcome

this problem, RCA had test-marketed a 33 $\frac{1}{3}$ -rpm standard-groove record for the home market in the early 1930s; but, because it would play only on a new-style record player, the project folded in the Depression economy within a few months.

In 1947–1948, however, engineers at CBS Laboratories, working under Peter C. Goldmark, devised a disc system with 33 $\frac{1}{3}$ -rpm speed and *microgroove* recording, which had many more recording grooves per inch of diameter. These two factors made it possible to put 20–25 minutes on each side of a 12-inch disc. CBS introduced this long-playing (LP) record in 1948 to an enthusiastic public in the form of a new system: slower recording speed, finer grooves, vinyl record base, a better stylus, higher quality microphones and recording amplifiers—all resulting in a vast improvement in the fidelity of sound and convenience of playing records. At last, the average music lover could hear superb reproductions of the finest music at his or her convenience. The LP—together with FM and interrupting of selections by commercials on AM stations—contributed to a drop in amount of classical music listening on low-fidelity AM radio. AM radio preferred serving a mass audience to a smaller class audience; but the public now expected higher sound quality on *all* radio, and that would require a considerable investment by stations.

A few months later RCA introduced its EP or “extended play” disc, intended primarily for popular music. A lightweight seven-inch disc with a 1 $\frac{1}{2}$ -inch hole in the middle—at first requiring another totally different reproduction system—revolved at 45 rpm and offered better sound quality than the 78-rpm record. Competition was tight for many months, with RCA even issuing symphonies and operas in the 45-rpm format, requiring a box of discs and killing the convenience of

extended play. Eventually the public balked at having to invest in three separate systems in order to play available records. The RCA 45 became the standard format for popular single tunes, while classics and collections of popular music were recorded on the 33 $\frac{1}{3}$ -rpm disc. RCA later unhappily adopted the 33 $\frac{1}{3}$ -rpm LP for its fine catalogue of classical music. In short order, the 78 faded from the scene except for collectors, and record players capable of all three speeds came on the market. This standardization proved beneficial to all concerned and established a home music-reproduction pattern that lasted until cassette tape recording became popular in the 1960s.

7•12 *The Coming of Tape and Hi-Fi*

In the late 1940s, magnetic recording arrived on the domestic professional and consumer market. In 1947 Sears Roebuck sold a military-developed model with thin wire as the recording medium for \$170—a very high price considering that the minimum wage was slowly rising from 25 cents an hour. It was intended mainly for business use, as its fidelity was not good enough for musical recordings and recording wire was very difficult to repair or edit. The machines were heavy and cumbersome but far more portable than earlier devices of comparable sound quality. The first tape recorders went on sale about the same time, using a $\frac{1}{4}$ -inch-wide paper base tape that allowed about 15 minutes of sound recording on a seven-inch reel.

If necessity is the mother of invention, then laziness may be the mother of necessity. The broadcast networks long had prohibited recordings because of their generally inferior quality, even refusing to bend the rules for on-the-scene news cov-

erage during the war. Popular radio singer Bing Crosby wanted to record his program rather than follow the usual network practice of doing two live shows in one night to cover different time zones. NBC's ban on recordings kept him from pursuing other interests, including golf. Crosby had seen tape recorders in use in Europe when he was entertaining troops during the war, and his Crosby Research Foundation, which eventually amassed many patents on magnetic tape recording, developed recording techniques and equipment of high quality. He took his program, and high ratings, to ABC, which welcomed him and his ideas. New techniques and devices, including plastic-based rather than paper-based tape, soon followed, and by the early 1950s reel-to-reel tape recorders were standard equipment at most broadcasting stations. Time zone differences could be handled by a simple replaying of a tape, and, in recording studios, networks, and stations, the Magnecord or later the Ampex recorder became a programming standby.

Development of the LP record and magnetic recording led to a new consumer industry. The term *hi-fi*—short for high fidelity sound reproduction—was used in England before the war for certain custom designs, but now small firms such as Fisher or H.H. Scott began applying it to limited and even mass-production equipment. Hi-fi addicts became sophisticated as to the size and location of loudspeakers, the power and distortion of amplifiers, and the specifications of radio tuners. Many hi-fi sets—actually collections of matched components—were designed to take advantage of the growing number of FM stations, many of which programmed classical music (see 7.62), the flood of LP records, and the promise of home tape recording. Where once only professional users of sound equipment

purchased precision devices, now a groundswell of consumers bought high-priced components, mass-produced units that frequently promised more than they delivered, and even build-your-own kits.

7•13 . . . and Television

The technical standards for television had been adopted in 1941 (see 5.15), but a number of important refinements appeared after the war. Chief among them was the new and sensitive orthicon camera tube announced by RCA in October 1945—and shortly afterwards the image orthicon still used today. This tube was a great improvement over the iconoscope and became the standard for years. Since the IO could work with much less light, television became more sensitive to minor light variations than most motion picture photography. Actors no longer had to swelter under hundreds of foot-candles of light, station owners no longer had to pay for enormous quantities of power and light, and engineers welcomed the stability of the new tube.

Another development was the use of motion picture film in television programming. There were many problems involved in matching a mechanical-optical medium (film) providing 24 pictures a second with an electronic medium (television) operating at 30 pictures a second. A workable means of telecasting films soon was developed, using a film projector with a special shutter aimed at a television camera. A *film chain*, as this combination was known, became the key piece of equipment for new stations as it could run feature or even free industrial or commercial films more cheaply than live programming. A mirror device even permitted *multiplexing* more than one projector into a single camera.

But preserving televised images was harder to do. For years, once a program was telecast, it was lost; there was no good way of recording both picture and sound from the television screen. Finally, in 1947–1948, a film camera was able to record pictures in synchronization off a specially bright television kinescope or picture tube—at a price: film, or *kinescope*, recordings of television programs were less clear, less well defined, had less contrast than the original television picture, and were far poorer than an original film. Thus, making *kines* was an art. The viewing public readily spotted even the best as a poor recording. Some programs were recorded in this way only for archival purposes, but the networks used kinescope recordings only to supply programs to affiliate stations not yet connected by wire or microwave relay for simultaneous transmission.

Kinescope recording was so unsatisfactory that several firms tried to develop an electronic system that would be more compatible with electronic television. Bing Crosby Enterprises conducted one of the first demonstrations of magnetic videotape recording in late 1951. Again, the singer was seeking a way to record his television musical variety program to avoid the inconvenience of doing it live. However, it took several years before videotape systems became commercially practical. By 1952 the tape still had to be moved at an almost fantastic 100 inches per second past the recording heads, but the picture was vastly better than existing kinescope standards. Videotape would also be cheaper than kinescopes because the tape could be reused many times, could be played back immediately without processing, and, most important, was electronic—probably equal in quality to live television. Broadcasters would have to wait until the late 1950s, but the end product—if RCA and Ampex were correct—would be worth waiting for.

7•2 Growth of AM, FM, and Television

The 1946–1952 period is characterized by an almost explosive growth in number of AM stations as well as the arrival of large numbers of both FM radio and television outlets. Although the new services were growing rapidly, AM radio outdistanced them in new stations and additional communities served by at least one station.

7•21 *Postwar Expansion of AM*

The pressure to open new AM radio stations was intense. The natural growth of radio had been held back for more than 15 years, first because of the economic depression and then because of the wartime freeze in priorities. In addition, many returning military personnel wanted to apply wartime radio training and experience to broadcasting—many to start their own stations. Businessmen were aware of the financial potential of radio, the capital was available for starting new stations, and prospects for the tried-and-true AM industry looked more favorable than the new services of FM and television (see 7.22 and 7.23), particularly since transmitting equipment and audiences were more readily available.

In addition, the FCC early in 1946 changed its technical standards for radio to allow more stations on the same or adjacent channels to be located in a given area. Since more stations on the same number of channels meant greater signal interference, the decision reduced the effective range of many stations and reversed the long-held policy of serving rural areas—overrepresented in Congress—through clear-channel stations. Under pressure from persons desiring licenses,

the FCC decided that local radio listeners would be better off with reception of one or two local stations serving local needs than with reception of one or two distant signals. After the rules were changed, even though existing stations were to have been protected, AM stations increased from about 930 in 1945 to more than 2,350 seven years later.

More than two-thirds of this growth was in smaller stations in smaller markets. Often the new station was the first in a town that previously had relied on distant stations. From 1945 to 1949 alone, more than 560 communities received their first local AM radio station, some received more than one new AM station and an FM station as well. From 1945 to 1950, additional stations on formerly clear (one station only) channels increased by 10, while regional stations rose by 68 and local stations by 453! But, as noted, this growth was achieved at the cost of greater interference. Whereas less than 10 percent of AM stations during the war had operated in daytime only, nearly one-third had to be so limited by 1950, and many more had to lower power at night or use directional antennas to protect existing stations. All of this made radio more complicated and expensive, and in some communities led to inferior reception. Where before the war there might have been several clear or high-power stations in a major city, after the war new lower power stations in many of that city's suburbs fragmented both the listening audience and the advertiser's dollars (see 8.5).

Not all AM operators were successful. A few went under and many remained marginally profitable in the late 1940s, partly because of the technical problems already described and partly because some officials and many broadcasters kept saying that AM was obsolete. They claimed that FM soon would replace AM and that

television would then reduce or even eliminate radio as a major force.

7•22 *The FM Enigma*

Expansion of postwar FM was clouded by Edwin H. Armstrong's continuing and losing fight to regain the prewar 40 MHz band for either FM direct broadcast or interstation relay, and by continuing difficulty in obtaining transmitters and other equipment designed for the new 88–108 MHz band (see 6.81). From 1945 to 1948, the 50 or so FM stations that had been on the air before the war could broadcast on both the old band and the new. At the end of 1948, low-band FM

transmissions were canceled, and some 400,000 prewar FM receivers became useless. Armstrong sparked two congressional investigations but could not dislodge the FCC from its 1945 decision to move FM to the new band nor lengthen the time allowed for the changeover. Many listeners, stuck with expensive but useless receivers, were cautious about supporting the new medium further.

To allay some of this concern, the FCC consistently referred to FM as the preferred radio service, even suggesting that AM might eventually be phased out in its favor and that television would have limited importance for some time due to its costs. On the surface, it looked as though many people were taking the pro-

Postwar Patterns: Broadcasting Explodes / The substantial and sudden growth of radio and television right after World War II marked a period of activity unique in broadcasting—all three services were growing together rapidly for the first time. That growth is apparent in this comparison showing stations actually on the air, authorized but not yet on the air, and pending applications for new stations—all for June 30 of each year. The FCC had dismissed without prejudice all wartime applications for AM and FM stations, explaining the “na” under “pending” for 1945 for both services.

Year	AM Radio			FM Radio			Television		
	On Air	Authorized (not on air)	Pending	On Air	Authorized (not on air)	Pending	On Air	Authorized (not on air)	Pending
1945	931	24	na	46	19	na	9	—	118
1946	961	254	680	55	401	250	6	24	40
1947	1,298	497	666	238	680	431	11	55	9
1948	1,693	331	575	587	433	90	29	80	294
1949	2,006	173	382	737	128	65	70	47	338
1950	2,144	159	277	691	61	17	105	4	351
1951	2,281	104	270	649	10	10	107	2	415
1952	2,355	65	323	629	19	9	108	—	716

Note: A freeze on new TV station authorizations was in effect from September 1948 until April 1952 (see 7.82).

Source: FCC *Annual Reports*. For summary data as of January 1, see Appendix C, table 1, which includes information for educational stations, excluded here except for AM (about 25 on the air each year).

ferred advice. At the end of the war, more than 600 applications for new FM stations piled up and the commission allowed recipients a “conditional grant” to proceed with personnel, studio, and program planning prior to station construction. The initial screening allowed faster processing of the successful applicant’s engineering submissions and got stations on the air in shorter time. Recognizing the demand for more channels, yet mindful that many potential licensees still in the military would be delayed in applying, the FCC held back some FM channels between 1946 and 1947, against strong industry opposition. By far the largest proportion of new FM licenses went to AM station operators; by 1949, for example, 85 percent of FM stations on the air were owned by AM licensees. Usually both stations were in the same town, with the FM outlet as insurance against possible AM demise—or protection against independent competition.

In its planning for FM, the FCC considered the lack of planning that had gone into AM assignments over the years. When AM stations applied for maximum power, the FCC had granted it as long as it did not cause major interference to an existing station, even though it might prevent smaller stations from getting started elsewhere and deny AM stations in the same market an equal technological chance to compete for advertising business. To avoid creating the same problem with FM, the FCC decided to assign all FM stations in a single area so that they were roughly equal in coverage, could compete for advertisers fairly, and would not cause interference elsewhere.

But the FM boom of the 1940s was short-lived. Total authorizations began to drop in 1949, and the stations-on-the-air count dropped the following year and kept dropping—as the number of AM and television stations continued to grow. FM’s

fortunes declined because (1) FM equipment companies had to take time to reengineer to the new higher band at the same time that prewar equipment became obsolete; (2) the resulting confusion in the minds of broadcasters, potential advertisers (see 7.51), and the public made buyers suspicious; (3) FM receiver sales were erratic and only a fraction of the number promised were manufactured (see 7.71); (4) common AM-FM ownership for more than 80 percent of the FM outlets lessened aggressive pursuit of FM success, and the limited money, time, and personnel were frequently committed to television; (5) duplicated programming on many AM-FM stations (see 7.62) made the newer radio service pointless to most potential listeners; thus (6) few FM networks offered special programming; and (7) advertisers showed little interest and support. In addition to these problems, FM had to compete with both its sister media: established and growing AM and more exciting television. By 1952, FM’s future looked bleak to all but a handful of independent station operators who programmed classical and other music for a small audience of hi-fi buffs. FM was a class service in what was supposed to be a mass medium. Two years later, frustrated by FM’s decline and exhausted financially and mentally by constant patent royalty battles with RCA, Edwin Armstrong killed himself, ending his two-decade-long fight for “radio’s second chance.”

7•23 *Establishment of Television*

As the postwar period began, only six television stations were on the air, in New York, Washington, Schenectady, Chicago, Philadelphia, and Los Angeles, broadcasting a few hours a day. Due to

Early Television Studios

Most pre-Freeze television stations varied greatly in layout, construction, and equipment. In the largest cities, giant radio studios designed for large studio audiences—including NBC's famous 8H, the home of the NBC Symphony Orchestra—were converted to television, and downtown motion picture and stage theaters were used as well. Most stations established a makeshift studio—few could afford two—in a building designed for some other purpose, with too low a ceiling for proper lighting, inadequate or nonexistent air conditioning, poor soundproofing, and a rabbit's warren of offices and corridors. Two studio cameras and their control units, at least one film chain for showing motion pictures, slides, or stills, and a network connection were all that was needed. Some studios were also oddly shaped or had supporting columns that interrupted space, camera movement, and lighting; some were housed in war-surplus Quonset huts. When a building was specially built, it was usually of inexpensive cinderblock construction. Although engineers liked the even illumination of fluorescent lighting, creative production people used motion picture lighting techniques because fluorescents could not be dimmed and were inappropriate for dramatic lighting. Too often, in the earliest studios, cameras moving over irregular wooden floors produced bumps and wiggles on the air. Microphones designed for radio had to be positioned so close to the actors that they often appeared in the picture. Monochromatic (black, white, purple) makeup had—thankfully—been discarded, but few studios bothered with

anything but shades of gray for their settings. Soundproofing followed radio practice, and absorbent materials were draped everywhere the fire inspectors would permit, to soak up echoes and camera noise and other movement. Since all programs were live, actors and other talent had to watch not only script, director, and clock but camera as well. The tremendous heat from the lighting—an actor could lose seven to ten pounds during a performance—made air conditioning essential for the sake of both people and equipment; but because of power demands, cost, and noise from air conditioners, many studios were uncomfortable hothouses even in the dead of winter. Even CBS had to use converted space for its New York studio; and if a camera broke down, as frequently happened with hand-made equipment, the show had to go on with only one camera.

Television stations operated by networks and large AM radio stations whose owners had been planning them for years still had too little space, even though the height in the studio may have appeared enormous to radio veterans; some studios had several cameras in each, and interconnected control facilities provided flexible operation. The needs for set construction and storage, repair space, and ready access for large and awkward equipment were usually overlooked by those without stage or feature film backgrounds, further reducing the number of "more than adequate" television studio installations. Television was new, experimental, in the red, and faced an uncertain future.



An early television drama takes place under the hot television lights (note the protective hat on the cameraman) and with boom mikes and theatrical sets. These programs were the training ground for the first generation of television technicians and on-air personnel. Courtesy of Wisconsin Center for Film and Theater Research.

some confusion on final allocations (see 6.82 and 7.81) and the high cost of station construction, television's postwar start was far slower than had been the case for either AM or FM. The additional investment, in the absence of public support, made investors wary. Television equipment was more complicated to manufacture, and equipment makers wanted first to meet the highly profitable demand for AM station equipment and receivers.

When the television Freeze began in September 1948 (see 7.82), only 34 stations were telecasting from 21 cities to about one million sets. The Freeze would artificially limit television to larger markets. Even if there had been no government-imposed moratorium, high capital and operating costs probably would have slowed television's establishment in smaller markets. Even in one-station markets with an audience monopoly, the great costs so reduced advertising income, determined essentially by audience size, that few stations could operate in the black in their first years. Yet, despite these limitations, the demand for television stations increased each year of the Freeze, as stations that had received construction permits got on the air. The major manufacturers of television transmitters—RCA, GE, and Dumont—were running six months late when the Freeze began, and were hard pressed to meet the demand when it ended. Pioneering would pay off handsomely. The 107 stations that got on the air before or during the Freeze became the major money earners of the industry for more than a decade afterwards.

Since in most cases pioneer television station operators also owned AM outlets, they had some broadcast experience and the AM operation was often the source of developmental money. But otherwise television was sufficiently new and different that owners had to feel their

way through problems of construction, equipment, programming, and daily operation. With few television-experienced personnel, a young war veteran might become a director in a matter of months, weeks, or even days—and had to learn everything on the job. This led to mistakes but also to a feeling of teamwork that lasted until the industry grew to the point of being impersonal. In one respect early television pioneering was markedly different from radio in the 1920s. Broadcasting itself was no longer new, and the pattern was clearly set: as soon as possible network interconnections of stations would cross the country (see 7.32), bringing common programming to all.

7•24 *The First Debate over Pay-Television*

An emotional issue in this period was whether television should be supported by direct payments from the public instead of indirect advertising revenues. The idea was not new—there had been pay-radio and even pay-television proposals in the 1930s—but the great increase in television costs over those of radio revived it in the late 1940s. Zenith, the giant Chicago radio and later television manufacturer, under the direction of Commander Eugene F. McDonald, Jr., was the major proponent of pay-TV, but also working on specific proposals and techniques were New York-based Skiatron and, on the West Coast, Telemeter, owned primarily by Paramount Pictures. Each firm had its own system, but all involved sending a scrambled picture via a normal broadcast channel and making the unscrambling technique available only to customers. This channel would be useless, of course, to persons who did not pay.

Zenith's "Phonevision" system initially sent signals over telephone wires to unscramble the television signal, which came over the air in scrambled form. This system was the first to receive a major test, when, early in 1951, some 300 families in Chicago were equipped with the telephone lines enabling them to purchase programs in addition to seeing regular "free" television. Many thousands of families had applied, and the sample was expected to be a cross section of urban population program interests. For three months the pay channel, an experimental station licensed to Zenith, supplied feature films and other special entertainment at least three times a day. Zenith maintained that the test was a major success, even though film distributors refused to supply first-run films for the venture. Early in 1952, armed with the test results, which could be interpreted in various ways, Zenith petitioned the FCC to allow regular pay-TV programming in major American cities. In the meantime, Skiatron tested its "Subscriber-vision" in New York, using the facilities of WOR-TV and another sample of 300. Telemeter conducted tests in Los Angeles and wealthy Palm Springs.

Backing for pay-TV came from major professional sports teams concerned about television inroads on their gate receipts (see 7.91) and from cultural organizations, such as symphony orchestras, seeking a new source of revenue. Violently opposed were movie makers and theater owners, although they accepted theater-shown pay-TV events, and commercial television broadcasters. Another group argued for pay-TV via cable, which did not occupy a scarce broadcast channel and was less susceptible to illegal unscrambling by ingenious technicians and tinkerers. Indeed, to prove that cable was the only practical method, one party had a standing offer to "decode" any unscrambling device

used with on-air pay-TV. All sides flooded the public with propaganda booklets and articles and appealed to the FCC for a clean-cut decision on pay-television, which the commission deferred until late 1968 (see 9.22).

7•25 *Effects of Growth on Ownership Patterns*

The drastic change and adjustment in postwar broadcasting is perhaps best seen in relation to station ownership. Between 1923 and 1945 only a limited infusion of new owners and ideas occurred because stations grew slowly in numbers and not many stations changed hands. From 1945 to 1952, however, the near tripling of AM stations and the arrival of FM and television produced a flood of new owners.

Prewar AM radio was controlled by companies or individuals concerned with station operation in major and medium-sized cities, where virtually all stations were on the air day and night and transmitting power increased steadily over the years. One of the largest ownership classes was newspapers, which owned some 30 percent of all stations by 1940. But by 1952 they dropped to just over 20 percent, as newspapers concentrated on the newer media (see below) and independent broadcasters, many of them war veterans, opened AM stations.

The new stations tended to be in smaller towns and suburbs, had less power—most were on regional or local channels—often were restricted by directional antennas or limited to daylight broadcast hours, and had to face competition from FM, television, and older AM stations. These variances led to far greater divergence at industry conventions than before. A large proportion of the new stations

competed without network affiliation, which, prior to 1947 or 1948, had been considered almost essential to rapid success. This was due to two factors: the networks did not want or need affiliates to overlap in geographical coverage, and the role of radio networks was declining (see 7.31). The overall effect was to create greater diversity in AM operations.

Most FM stations were built by AM licensees. They not only possessed experience in broadcasting but often were first in line for the new services, wanting to protect their AM investment and possibly profit from new financial opportunities. AM licensees owned roughly four-fifths of FM stations, which usually only duplicated AM programming (see 7.62) and occupied channels that an independent (non-AM) owner might otherwise have used. This is not to suggest a conspiracy, but it helps explain FM's impending problems of survival. Newspaper owners moved into FM as they had earlier built or purchased AM stations. Throughout the 1945–1952 period, with minor fluctuations, newspapers controlled about one-third of the FM stations on the air.

Most early television stations also were operated by AM licensees. Television required some outside revenue to survive several years of massive losses, and, with the exception of stations that were supported by receiver sales—Dumont, GE, and RCA, for example—this came from AM income. Newspapers were bigger owners in television than they had been in either radio medium. By the beginning of the Freeze in 1948, they controlled nearly one-third of the television stations. More important, since they held a large number of approved applications, by 1952 they owned more than 45 percent of the television stations. Television costs tended to encourage multiple-station ownership, whereby an owner could apply economies

of scale to management even if it had only one station in a given region, since television owners often were larger corporations with nationwide interests, whereas radio was generally considered small business.

The coming of FM and television raised a phenomenon that had disappeared from AM broadcasting with enforcement of the duopoly rule: a single owner possessing more than one station in the same market. AM-FM, AM-TV, and AM-FM-TV combinations lessened the diversity potential of new media and new owners, for now a single owner could run three stations—and sometimes the newspaper, too—under single direction in the same market. Some smaller communities had only one media owner. Critics became increasingly concerned about this concentration of media control (see 9.84).

7-3 Radio Networks Give Way to Television

At the end of the war in 1945, 95 percent of all radio stations were affiliated with one or more of the four national networks. Only seven years later, affiliation had dropped to just over half of all radio stations on the air. In the same period, television networks grew from vague proposals into powerful combinations having affiliation agreements with virtually all on-air television stations. Between these two developments, the industry saw radio as a *national* advertising and programming medium give way almost totally to television.

7-31 *The Old Order Passes*

Oddly enough, the radio networks ranked in number of affiliates in reverse

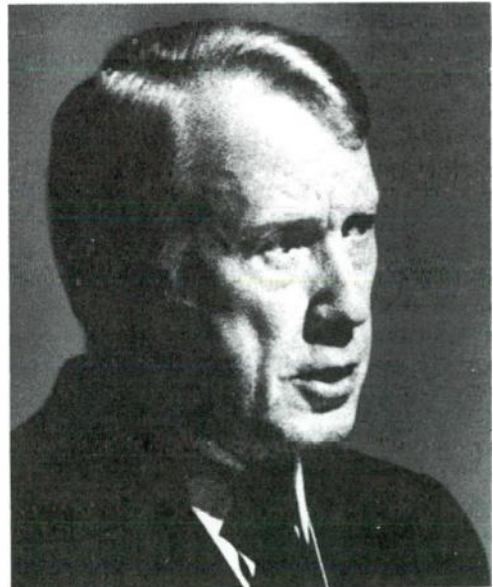
order to their importance in broadcasting. CBS and NBC led in importance and impact, but ABC had about 50 more affiliates than either of them and Mutual had two and one-half times as many, although these usually were smaller rural stations lacking the audience pull of the major stations affiliated with NBC and CBS. Newest of the major networks was the American Broadcasting Company, as the Blue Network was known after 1945 (see 6.3).

CBS had named thirty-seven-year-old Dr. Frank Stanton as its president early in 1946, although William Paley retained ownership control. From this position Stanton became a spokesman for the broadcasting industry during the next 25 years, much as David Sarnoff spoke for most of the electronics industry. Both NBC

and CBS observed their twenty-fifth anniversaries in 1951–1952, with promotional hoopla about the great past days of radio and the wonderful coming days of television. Internetwork rivalry continued, with both ABC and CBS making major talent raids (see 7.61) on bigger NBC. Starting as early as 1947, ABC sought merger partners to bolster its financial position (see 7.32). A swap in call letters was arranged over several years to identify flagship stations more easily with their network; for example, CBS's WABC call letters went to the American Broadcasting Company's New York outlet, whose WJZ call letters went to Baltimore after a decent interval, while CBS obtained the call letters WCBS from a station in the South.

Even with the FCC chain broad-

The CBS Team/CBS radio in its most important days and CBS television for its first quarter-century was shaped primarily by two men: Since 1929 William S. Paley (left) served first as president and then as chairman; and Frank Stanton (right) served as president from 1946 to 1971. Both men are shown in the late 1960s. For the competing NBC executive team, see page 330. Photos courtesy of CBS Inc.



casting rules (see 6.85), the national networks exercised great power over individual affiliates. In several cases, when local radio stations wanted to substitute a local program for a network program, network officials threatened to reconsider the station's affiliation contract. Even though the station licensee, by law, had the responsibility for what went over the air, until 1948 or so such threats had great effect, for network affiliation was the key to success.

Later, however, as independent radio stations increased and television networks expanded, the radio network declined in importance almost as fast as it had risen, leaving a residue of news, brief features, special events, and well into the 1960s such die-hard entertainment programs as Arthur Godfrey on CBS and Don McNeill's *Breakfast Club* on ABC. With audience interest focusing on television, advertisers and popular programs soon left radio for television. By 1951–1952, large chunks of time previously network-programmed were coming back to the affiliate stations for local programming.

The change in role was not unexpected. Early in 1949, NBC President Niles Trammell predicted that "within three years, the broadcast of sound or ear radio over giant networks will be wiped out." But apparently most network executives did not agree. For various reasons, chiefly its much higher costs, they felt that television would grow slowly enough to make a gradual radio-to-television transition during the 1950s. But the public's interest in and advertiser fascination with television, as well as the impatience of radio executives to make a mark in television, left network radio a dying operation by 1950.

There were still attempts to introduce different types of radio networks. Several were limited, regional FM-only arrangements. But in late 1947, the exclusively FM Continental Radio Network

added eastern and midwestern stations by use of AT&T wire or off-air relays. Programs of music originating at several stations were picked up by other affiliates, with some distant stations receiving the material on tape or by wire lines. FM inventor Edwin Armstrong, whose own W2XMN in Alpine, New Jersey, was an important affiliate, secretly met nearly all the expenditures of the operation. Continental went out of business after Armstrong's death. For a time in the 1940s, both ABC and CBS proposed special networks for their FM affiliates, with high-fidelity duplication of AM network programs. This proposal was aimed at protecting the network organization should AM die off, but, in the end, a few FM stations simply affiliated with conventional low-fidelity AM-based networks.

More interesting, and generating considerably more publicity, was the establishment of the Liberty Broadcasting System. Begun as a single station in Texas by Gordon McLendon in 1948, LBS was based on skillful re-creation of baseball games by McLendon, who combined wire service reports of an ongoing game with sound effects records to make his listeners think they were hearing a play-by-play description. The legality of the method was questionable, because the ball clubs controlled the rights to game broadcasts. By 1949 McLendon's station was feeding the games to more than 80 others in the Southwest. Recreating both baseball and football games—and carrying many as direct play-by-play broadcasts—McLendon's operation had expanded to 200 stations by 1950 and was assuming network stature, with six hours of programming per day. McLendon announced plans for a nationwide network with 16 hours a day of varied programming, just when the established networks, except for Mutual, were letting their radio operations

slide in favor of television. By June 1951, the Liberty network had 400 affiliated stations and boasted a strong news department with a growing reputation. Then the organization started to come apart. To obtain funds for continued expansion, Liberty brought in a Texas oilman whose role and conservative views soon decimated the news staff. At about the same time, several ball clubs brought suit against Liberty. The costs of litigation, plus natural advertiser and broadcaster aversion to legal controversy, led to suspension of network operations in mid-1952. A couple of revival attempts failed, and Liberty's former affiliates either signed with one of the big four or turned independent.

Perhaps the radio networks assisted in their own demise when they provided the initial financial support for television stations and networks, an invaluable training ground for personnel, and models for television network organization, operations, and programming.

7•32 *The New Television Networks*

The expansion of television networks has to be examined in relation to (1) the technology and implications of coaxial cable and microwave relay, and (2) the actions of individual networks. The required technology for interconnection of television stations was understood by the early 1940s, but wartime priorities and the high cost of installation in relation to a very few stations and receiver owners delayed action. As with existing radio network interconnections, AT&T would provide the means of television networking and rental charges on stations and networks would pay for it—another direct outgrowth of the 1926 radio group–telephone company agreement (see 3.23). The

first coaxial television cable (see Appendix B), between New York, Philadelphia, and Washington, D.C., was laid by mid-1946. Television stations in the three cities were thus able to carry the Louis-Conn heavy-weight championship boxing match by cable, and the Schenectady station received the telecast by relay and rebroadcast it to its small audience. The wide publicity given to that event helped convince many persons that television networks were not far off. By November 1947, the cable was extended from New York to Boston, interconnecting the major population centers of the coastal Northeast. Turning west, AT&T engineers interconnected stations in the East with those in the Midwest by late 1948 so that major cities in the northern and eastern half of the nation were receiving network programs simultaneously. Major interconnection links ran from Boston to Washington, from Philadelphia west to Chicago, from Milwaukee south to St. Louis, and from Detroit to Cincinnati. Expansion of network lines from this point took more time since population centers were farther apart.

In an almost direct parallel to the events of the early 1920s, the embryonic television networks clashed with AT&T over the rates to be charged for use of the coaxial cable. AT&T wished to establish a permanent tariff as soon as possible and discontinue experimental use of the line. When the broadcasters, judging the proposed rates far too high, refused to pay, AT&T cut off the service. Before a compromise was reached, a New York station used old Western Union twisted-pair telegraph lines to carry the video signal of the six-day bicycle races from Madison Square Garden to the studio—just as, more than 20 years earlier, the same licensee had used Western Union wires to carry the same races on radio during a similar battle.

Since the South and the West had

fewer stations and viewers—in spite of a north-south interconnection installed on the West Coast in 1950—AT&T's investment in coaxial cable would take much longer to be paid off. Of course, the cable also could carry thousands of simultaneous telephone conversations, but telephoning also was greatest between major centers of population. Construction began on the main trunk east-west line in 1950. On most of this route point-to-point microwave radio relay towers with the same signal-carrying capacity as the coaxial cable were built about 30 miles apart, so that each tower would receive the signal, beef it up, and retransmit it to the next tower. All this was done at electronic speeds, with only a fraction of a second elapsing from initiation of a television signal on one end of the line to its reception on the other. The line was finished in time for testing in late summer 1951, just 36 years after completion of the first transcontinental telephone line. AT&T had laid plans for an inaugural program on all four networks late in September, but when President Truman was scheduled to address the peace conference officially ending the war with Japan in San Francisco on September 4, that occasion was used to open the coast-to-coast link. Ninety-four stations carried the address to about 95 percent of the country's television sets, with a potential audience of a million viewers. The remaining stations got a delayed program by kinescope recording. A few weeks later, regular national network telecasting began, sharing the one line. One of the first broadcasts was CBS's new *See It Now* series with Edward R. Murrow (see 7.64). It opened with a shot of Murrow in a control room with television monitors showing *live* scenes from both the Atlantic and the Pacific oceans. Television had obliterated distance and opened a window on the world.

The development of television networks differed in several respects from

the rise of the radio chains. First, the video webs grew directly and rapidly from radio organizations complete with personnel, funding, and expertise, and they led the television industry from the start rather than following individual stations as radio had done. This also speeded the industry's development. Second, virtually all stations were affiliated with one or more—frequently two or three—networks at a time; the only independent stations in those early years were in New York and Los Angeles. Third, networking developed on a broad front, with no fewer than four competitors throughout this period. As with radio but to a greater degree, the networks initially lost money, with even owned-and-operated stations earning too little to cover the massive capital expenditures, but were operated with the expectation of future profits. Fourth, although radio networks could use conventional AT&T or even Western Union wire lines, television networks depended on installation of coaxial cable or microwave circuits for intercity connections. Fifth, television offered more program variety from the start than radio did in its earliest years (see 7.63 and 4.6).

It was clear as early as 1941 that owners of the more profitable radio networks would undertake the formation of television networks. First into the ring after the war was NBC, which by February 1946 had an informal four-station network of flagship WNBT in New York and affiliates in Washington, Philadelphia, and Schenectady. Since new stations nearly all immediately assumed a primary or secondary affiliation with NBC, by fall 1948 NBC had nearly 25 affiliates throughout the Northeast and into the Middle West, plus some noninterconnected affiliates on the West Coast. This marked the start of the first network season. Before 1948 most stations programmed on their own, receiving only a few programs from the fledgling networks.

Because ABC was the newest radio network and a weak third in importance (see 6.3), it decided to move rapidly into television to attain equality with NBC and CBS. It signed an affiliate in Philadelphia even before opening its first owned-and-operated station. Expansion into television was a heavy investment for a network controlled largely by one man, Edward Noble, who had a majority ownership stemming from his purchase of the Blue Network from NBC in 1943. As a result, ABC floated a series of stock sales in the late 1940s to fund network expansion. Even by 1947 there were rumors that ABC was seeking either a merger partner or a purchaser to gather sufficient capital to compete with better-financed CBS and NBC. Early in 1951, ABC admitted that it was negotiating with International Telephone & Telegraph, CBS, and General Tire & Rubber. The latter two companies planned to split up the network if successful in their bids. But Noble decided against division of the network and turned to a new prospective partner, United Paramount Theaters (UPT), headed by Leonard Goldenson.

UPT was the exhibition side of the original Paramount motion picture company, divorced from the production side as a result of a court mandate following an antitrust consent decree (see 7.91). UPT had money to invest in broadcasting and, after intensive bargaining, ABC and UPT announced in May 1951 that they would exchange stock and merge, with Noble as chairman of the board, and Goldenson as president. The two firms' boards approved the deal that summer and asked for FCC approval, required because transfer of control of stations was involved. The FCC held long hearings on UPT's previous antitrust problems in the motion picture field and their potential influence on its operation of a broadcasting network, and also

weighed the basic question of such concentration of media control. Final approval of the merger in February 1953 gave ABC cash to continue television expansion, which almost had stopped in 1951 for want of capital. But this time ABC was still in a weak third position from which it took more than two decades to recover.

CBS was a relatively small company among American businesses, unable to command the financial leverage of RCA. It entered television strongly backing its own color system and holding back on network expansion until the color decision was in (see 7.821). As a result, unlike both NBC and ABC, CBS had to purchase rather than build most of its O & O stations in major markets. Its choices were fairly limited and the stations it bought could not contribute much to network startup costs.

A fourth television network was *without* radio connections. In 1944 Allen B. Dumont put WABD, named for himself, on the air in New York with announced plans for a postwar television network. After the war, Dumont started WTTG—named after his chief engineer, Thomas T. Goldsmith—in Washington, and pressed ahead with his network plans. His financial support came from a prosperous television manufacturing business. Dumont's plan was to expand along the Atlantic Coast and then pick up affiliates and other O & Os inland as receiver ownership increased and the AT&T coaxial cables expanded westward. Unfortunately, this plan did not succeed. New television stations typically took on a primary affiliation with a major network, usually NBC or CBS, and at best made a secondary or tertiary connection with ABC and Dumont—with Dumont often left out. To earn income, the Dumont network offered to sublease its AT&T-supplied network lines in daytime hours for closed-circuit use at \$11,000 an hour, but there were no takers. The affil-

Network-Owned Television Stations: A Changing Cast / The following table shows network-constructed (C) or -purchased (P) owned-and-operated stations from 1941 to date. There was (and is) a restriction on the number of VHF stations that a single owner could control (five), and there was only a brief period when CBS and NBC experimented with the two UHF stations each could own. The cities are listed by their market order in the mid-1970s. For each station entry, the top line gives the current call letters (or the call used when network owned the station minus any "-TV" suffix) and the channel number, while the second line provides the date the station began operation under network control, with a letter indicating whether the network constructed or purchased the station. Termination dates are shown for stations no longer network owned. Current O & Os are boldfaced.

Market Rank/City	ABC	CBS	NBC
1. New York	WABC (7) (1948, C)	WCBS (2) (1941, C)	WNBC (4) (1941, C)
2. Los Angeles	KABC (7) (1949, C)	KTTV (11) (1948–1951, P) KNXT (2) (1951, P)	KNBC (4) (1947, P)
3. Chicago	WLS (7) (1948, C)	WBBM (2) (1953, P)	WMAQ (5) (1948, C)
4. Philadelphia	—	WCAU (10) (1958, P)	WRCV (3) (1955–1965, P)
6. San Francisco	KGO (7) (1949, C)	—	—
7. Detroit	WXYZ (7) (1948, C)	—	—
8. Cleveland	—	—	WKYC (3) (1948–1955, C) (1965, P)
9. Washington	—	WTOP (9) (1950–1954, P)	WRC (4) (1947, C)
12. St. Louis	—	KMOX (4) (1957, P)	—
13. Minneapolis–St. Paul	—	WCCO (4) (1952–1954, P)	—
21. Hartford–New Britain	—	WHCT (18) (1956–1958, P)	WNBC (30) (1956–1958, P)
24. Milwaukee	—	WXIX (19) (1954–1959, P)	—
28. Buffalo	—	—	WBUF (17) (1955–1958, P)

ABC: ABC built the five stations it owns, and has not changed any of them for other operations in other markets. Technically, the licenses did change hands when ABC merged with United Paramount Theaters in the 1950s.

CBS: CBS station interests in markets 2, 9, and 13 were minority interests, not controlling shares, ranging in each case from 45 percent to 49 percent. Its short-lived operations in markets 21 and 24 were the only CBS ventures into UHF operation. Of those, the Milwaukee station has since been deleted entirely. The present CBS station in market 2 is wholly owned.

NBC: For the story behind NBC ownerships in markets 4 and 8, see text 8.3. The Cleveland station is the only one owned by the same network at two separate times. NBC's short-lived experiments with UHF are found in markets 21 and 28. Its New York station has used a variety of call letters (WNBT, WRCA-TV, WNBC-TV).

Call letters and channels—particularly of stations that started as experimental stations—changed during the years.

All data from two sources: Network Study Staff, Federal Communications Commission, *Network Broadcasting*. 85th Cong., 2d Sess., House Report 1297 (1958), page 575, table 48, and *Broadcasting Yearbook*.

iated stations grew in number, but few took a substantial number of Dumont programs. As the Freeze on new stations (see 7.82) continued, it became obvious that Dumont's lack of network success had more than financial roots. There were too few channels in the major markets, only a handful with as many as four commercial stations on the air. As a result, he became an ardent proponent of providing an adequate number of competitive channels in most markets (see 7.82).

Within a short six years, television networks went from paper plans to operating coast-to-coast entities. The operating pattern of networking was quickly based on the radio model—except that the networks, rather than the advertising agencies, had to bankroll expensive program development (see 7.5)—and has changed little since. Virtually all on-air stations, other than those in the few cities with four or more commercial channels or in the hinterland beyond network service, were affiliated with one or more of the national networks.

7•4 Rebirth of Educational Broadcasting

The outlook for noncommercial educational broadcasting was brighter in 1945 than it had been for 15 years. First, there was a new radio service: noncommercial FM broadcasting. Second, pressures were building for similar channel reservations for educational television. Educational organizations that had nearly been squeezed out of the AM band since the mid-1920s would finally have opportunities and room to broadcast.

7•41 Expansion into FM

Placement of the educational allocation on the 88–92 MHz band in 1945 (see

6.82) made educators especially optimistic. The number of FM educational stations on the air grew steadily from six in 1946 to more than 90 in 1952—14 percent of all FM stations on the air. Particularly useful was the NAEB, which helped lay plans for a national FM network of stations, with an interim tape-recording program exchange to serve the many university-owned stations in the Midwest and community and educational institutions elsewhere. The concept of the NAEB Tape Network started when Seymour N. Siegel, manager of New York City's noncommercial AM-FM station WNYC, saw his first hand-made American magnetic tape recorder late in 1946. In 1951, the NAEB received a Kellogg Foundation grant to establish permanent headquarters at the University of Illinois and begin a tape duplication operation to facilitate a noninterconnected "bicycle network," in which one station's programs were delivered to other stations in succession. More than 40 stations soon were participating. Efforts to set up a national interconnected noncommercial FM network, however, lagged until the late 1960s. Some regional networks were established, especially in Wisconsin where by 1952 a state-supported eight-station network provided a full day's programming to most of the state.

Perhaps chastened by earlier experiences with educational AM radio, educational institutions, school districts, and municipalities applied for FM licenses very slowly. Apart from past disappointments and the problem of cost—especially for colleges and universities straining to serve millions of postwar students—potential educational FM station operators were wary of the continuing scarcity of FM receivers (see 7.71) and television's possible effect on radio. Late in 1948 the FCC, recognizing the burden of high cost and the limited or campus-only uses planned by

some colleges, allowed educational FM licenses to broadcast with as few as 10 watts of power—enough for a two- to five-mile range—instead of the normal, more expensive lower limit of 250 watts. By requiring fewer technicians with high training, the low-power class added many new stations. Of the 92 educational FM stations on the air in 1952, more than one-third were 10 watt operations.

7•42 *Hopes for Educational Television*

More than anything else, the lobbying effort for educational reservations for television (see 7.825) forced a not yet completely mended split among educational broadcasters. Some concentrated quietly on radio and other traditional media, while others focused on high-pressure lobbying and fund-raising for educational television (ETV). The problems were immense; few schools or districts could afford television broadcasting, and commercial broadcasters, contending that they could meet educational needs, tried to defeat any reservation of channels for education. That claim had been voiced before, in the late 1920s and when Congress debated the Communications Act of 1934. It sparked educators to work together to convince their boards that ETV was worthwhile, and to maintain the right to seek their own station.

In October 1950, with the enthusiastic backing of FCC Commissioner Frieda Hennock, a successful lawyer who was the first woman commissioner, representatives of several organizations met to form the Joint Committee (later Council) on Educational Television (JCET). With foundation and other support, JCET mounted an intensive campaign before the FCC for educational television reserva-

tions. This organization first was seen as an ad hoc group which would cease operations as soon as the FCC provided the reserved channels, but its need for permanence soon became clear. For one thing, JCET had to fight a two-front battle—getting the needed allocation on the one hand and finding and encouraging potential educational broadcasters on the other. CBS, having to *buy* into top markets because of its late entry into television station ownership, and the National Association of Broadcasters were the chief opponents of reserved channels for education. They contended that educators were not ready for television and that, at most, some UHF channels, not allocated to television, would suffice. Also bothersome were conservative educators who only recently had grasped the potential benefits of radio, let alone far more expensive and complicated television. In addition to lobbying, JCET provided a public information program to mobilize public opinion in ETV's favor until a prestigious cooperating organization, the National Citizens Committee for Educational Television, took over this function.

Reasoning that proof of the lack of educational material on the air would influence FCC decision-makers, NAEB sponsored content analyses of the program fare of commercial stations in major cities. The first, covering a January 1951 week of New York television, found virtually no educational programming. Studies in other cities during 1951–1954 showed the same pattern (see table on page 282).

In spring 1948 at least five universities were active in ETV. The University of Iowa had applied for a station, Iowa State University had received a construction permit, the University of Michigan was providing educational programs over a Detroit station, American University was doing the same on a Washington, D.C., network outlet, and Kansas State Univer-

sity was continuing experimentation. To get coverage over a wide area at limited cost, educators took part in Westinghouse and Glenn L. Martin aircraft company experiments with “Stratovision” in the late 1940s (see 7.823) and provided regular airborne transmissions in the 1960s (see 9.4).

In February 1950 Iowa State’s WOI-TV at Ames, Iowa, became the first non-experimental educationally owned television station. Taking some programs from the networks and selling advertising, the station was able to support a variety of educational programming without expense to the university. WOI-TV soon sent material to other schools for placement on commercial stations until they could have their own educational channels.

For the first time in years, since they allowed AM licenses to slip from their fingers in the late 1920s and early 1930s, educational broadcasters had something to work and plan for—expansion into FM and television. The allocation of specific reserved channels, in the early 1940s for FM and in 1952 for television, saved educators from having to compete for outlets with potential commercial broadcasters. After three decades of commercial broadcasting, nonprofit licensees and potential licensees now had a chance to show what *they* could do.

7•5 Radio Advertising Supports Television

The end of the war saw the end of the excess profits tax and ten-cent-dollar advertising (see 6.5). But now consumer advertising for goods and services would expand as industry reconverted to civilian needs. Advertising time and space sales more than doubled from 1945 to 1952, from just under \$3 billion to well over \$7 billion. Newspapers continued to receive about 35

percent of the expenditure, with broadcasting in second place with 15 percent. The percentages changed little, but from 1945 to 1952 broadcast advertising volume increased from \$425 million to more than \$1,078 million. While television got little of that prior to 1950, by 1952–1953 television and radio divided the ever larger broadcast advertising pie about evenly.

However, these overall figures tend to hide a number of important—and, for some broadcasters, serious—internal developments.

7•51 *The Changing Economics of Radio*

While advertising revenues generally supported FM and television as well as AM, major shifts were occurring in radio advertising. First, advertising agencies had less control of programs, especially after CBS moved in 1946 to take more control of network programs. Criticism about the role of agencies in radio may have been involved, but the rationale for the switch was that it gave the networks more of radio’s potential profits, which they needed for their expansion into television. The agencies, on the other hand, while willing to risk capital on developing new radio programs to sell to advertisers, refused to risk the amounts that would be necessary for television programming and reduced all their broadcast programming activities (see 7.52). Another change in advertiser support of AM network radio was that, as audience and advertiser interest in television waxed, interest in network radio waned each year.

While radio advertising revenue was rising, the network share of it, including O & O stations, fell from \$23 million to just over \$11 million—a drop of more than 50 percent in seven years. The four net-

works' share went from 47 percent in 1945 to 26 percent in 1952. As early as 1948, more and more programming became sustaining and networks repeatedly cut their time charges, but to no avail. Advertisers changed to local spot radio and other media, including television. Once network radio started to slip, it went fast.

Locally, two conflicting trends spelled financial trouble for many postwar AM stations. As radio went from a national to a local advertising medium, its competitive stance changed. The local radio station proportion of radio income increased from one-third of radio's revenues in 1945 to well over one-half just seven years later. Although the increased revenue was welcome—and overall radio advertising was up too—the pot had to be split among more stations than before and competition with other media was fierce. Whereas up to and during the war radio competed mostly against magazines and a few major newspapers for a national or regional audience, after 1950 it competed directly with the well-entrenched chief local advertising medium: newspapers. There were, of course, twice as many daily newspapers as radio stations at first, but the postwar growth of radio balanced these numbers.

The very growth of radio was one of its worst problems, since more stations meant more operators scrambling for available advertising dollars. New stations commonly operated in the red for a longer period, with perhaps one-third of *all* stations losing money in any given year. Stations allowed on the air only during daylight hours suffered in their search for advertisers, as did those with low power or especially restrictive directional antenna patterns. Early in 1947, the FCC issued *An Economic Study of Standard Broadcasting*, which suggested that the financial outlook for radio was dim because the increasing

number of new stations would get ever smaller pieces of the advertising pie. The FCC report suggested that “old” radio markets would have the most difficulty, with new stations taking advertising from old ones; whereas in “new” radio towns the first station would have only the local paper as competition.

Amid these internal changes, however, even though *network* radio was dying, at no time prior to 1953 did *overall* radio revenues fail to grow each year (see Appendix C, table 4). AM radio's share of all advertising income dropped from 15 percent in 1945 to 9 percent in 1952, but the total dollar value for revenue kept increasing.

While AM radio had problems in distributing income, at least it had the income to distribute. The FM station operator usually had little or no income at all. The reasons for FM's failure to attract money during its period of growth were several and serious, and, as will be seen in future chapters, none of them was easily overcome.

Foremost was that advertisers saw FM radio merely as another kind of radio. They were spending on AM, and frequently on television (see 7.52), and could not figure any gain by adding FM. To a large degree, they were right; most FM stations merely duplicated the programming of their sister AM stations, making the FM audience, such as it was, a free bonus. This mass giveaway of FM time was almost fatal to the few independent FM stations that tried to sell advertising. In addition, few FM operations could obtain and show to advertisers information as to how many listeners in the market owned FM receivers. Advertiser analysis of FM receiver sales (see 7.71) suggested a small audience. Stations not duplicating AM programming soon earned a reputation for “fine music” programming, which,

although admirable to their faithful listeners, attracted far too few people to attract advertising. Of those stations trying to sell time, few published rate cards, making it clerically hard for prospective purchasers.

Total FM revenues did not pass \$1 million until 1948, and at no time during this period was the FM industry collectively even close to the black. A few big independent stations did fairly well in major markets—thanks to loyal audiences providing some direct support for the programming—but most were a drain on their owner's finances. Chiefly because of this drain, in the face of radical adjustments in AM radio, and the continuing demand of television expenses, hundreds of FM stations folded after 1950. Unable to bolster a system that obviously had peaked and now was in decline, broadcasters cut their losses and concentrated on AM and television.

7•52 *Video Commercialism*

Though soon to become the leading national advertising medium, television began in this country in a limited, local setting, and advertising revenues did not begin to cover programming and technical expense. Thanks to the precedent of more than two decades of radio advertising, advertising promised from the start to become television programming's prime support. The major question was: when would television reach enough big city audiences to make network television worthwhile—for advertisers feared its huge cost. As one research report put it late in 1949, "We seriously doubt that television will ever become a truly nationwide medium (as compared with present radio patterns and service) if it has to depend on the economics of advertising alone."

Television costs in the late 1940s generally ran ten times higher than those for radio. Construction of a station without live production facilities, equipped only for reproducing movies or programs from another station, cost much more than the typical radio station. Construction of a fully equipped station with at least one studio, a film and slide chain, and network capability cost considerably more. Running such a station took many more trained technical and business personnel. A typical network prime-time program cost between \$6,000 and \$8,000, and even the far less costly local programs ran much higher than radio's finest show. The visual demands of television—sets, lighting, costumes, makeup—and more personnel, the costs of buying, maintaining, and operating television cameras and other studio equipment—all added up. Finally, the costs of laying coaxial cable or setting up microwave links—even in 1949–1950 when the network reached only from the eastern seaboard to the Midwest—led AT&T to raise its hourly charges to at least ten times the comparable charge for radio network lines. These initial construction and continually rising operational costs kept the television broadcasting industry in the red until 1952, and many stations were money losers long afterwards.

Faced with time charges high enough to cover such costs, advertisers moved into television very cautiously, and some agencies stayed out completely, fearing that their standard commission would never cover the work and costs of getting into television. The agencies also abandoned the field of network program development, which they had dominated since the late 1920s. Companies that began to advertise in 1946–1948 aimed to secure a time slot on a given station, to obtain rights to talent or program ideas, to gain experience while the rates were compara-

tively low, or just to experiment with the new medium. Polled after initial advertising stints, most sponsors had little idea of the impact of their messages, especially since audiences were so limited. Advertisers without radio advertising experience were extra cautious.

Early commercials ran from the "standard" minute format to occasional *pitches* or advertising "programs" of 15 or 30 minutes. Early television commercial experiments sought an effective combination of visual and aural appeal at the least cost. The simplest advertisements were merely signs held before a television camera while an announcer off camera voiced the brief message. Slightly more involved ads combined slides and announcer talk. Even more complex was the silent film with live announcer—the first format to use movement in a commercial. The sound film, especially with animation and other visual sleights of hand, quickly became popular with sponsors, despite its costs. Many sponsors chose the lower costs but greater simplicity and greater risks—particularly if something went wrong during a demonstration—of live television. A television commercial could cost as little as \$50 or as much as \$10,000 to *produce*—before buying time on which to show it to an audience. Product identification became of utmost importance, and symbols or animated characters introduced on television spread the advertising message by word of mouth and other media. Gillette continued to back sporting events on radio while moving into television. It sponsored the Joe Louis–Billy Conn heavyweight fight of June 1946—the first interconnected "network" program. Bristol-Myers sponsored a series of travel films, becoming the first sponsor of any television series.

During these early years most advertisers sponsored entire programs and became identified with the program and

its stars. For example, Texaco's identification with *Texaco Star Theater*—the Milton Berle show, a Tuesday night institution—sold a lot of gasoline (see 7.63). Although the network often owned the program, full sponsorship allowed the advertiser considerable control. As rising costs made partial sponsorship or spot buying necessary, the advertiser's influence on the program faded.

Television advertising was placed with individual stations until 1949 when the eastern and midwestern branches of the networks were connected. Network advertising became possible as interconnected stations supplied a widespread audience for the same program at the same time. Network advertising accounted for at least half of the 1949–1952 television advertising (see Appendix C, table 5), as local advertising dropped from one-third to less than one-quarter and national and regional spot ads rose in importance. Thus the emphasis of television advertising was set nationally from the start. The first network rate card, issued by NBC in June 1949, offered advertisers 19 interconnected stations for \$7,000 an hour; New York alone was \$1,500. By adding other noninterconnected stations, which would insert the ad by film, NBC charged around \$10,000 an hour for its 34 affiliates. These rates appeared astronomical to advertising agency and advertiser personnel used to radio's rates, but in a few short years they would seem amazingly cheap.

7•6 Programming: Both Heard and Seen

No startling new types of programming appeared in the immediate postwar years. Strong internetwork rivalry in both radio and television marked the difficult transition of many programs from

Network Radio Programming: Fred Allen and “Stop the Music”

Two developments in this period epitomize what was happening to radio network programming—and both affected radio comedian Fred Allen. For 15 seasons Allen’s Sunday night hour (later a half-hour) on NBC had been one of the ten most highly rated shows. His first problem was more a public relations man’s dream than anything else. One of Allen’s key joke targets had been the many NBC vice presidents: Allen noted that their job, on finding a molehill on their desk in the morning, was to make it a good-sized mountain before they left that afternoon. Things came to a head, however, when Allen ran overtime on the April 27, 1947 show and his comment about NBC having a vice president in charge of program ends—who saved minutes and seconds of program time until he had two weeks’ worth, at which time he took a vacation—was cut off the air. The problem snowballed the following week when NBC cut off Bob Hope and Red Skelton when each tried to joke about Allen’s hassle. Newspaper stories and ads indicated that ratings of all the affected programs were going up. It was a tempest in a small teapot, but the enmity between Allen and NBC brass did not help him later when he was in trouble.

In 1948, ABC began *Stop the Music*, a national music quiz program starring Bert Parks. It placed telephone calls at random across the country. When a person answered, Parks would call to the show’s orchestra to “stop the music!,” and the

caller who could name the tune being played—the assumption was that he or she would have been listening to the program—won big prizes. ABC put this program opposite Allen’s Sunday night slot with bad results for the comedian. His show dropped from the top 10 to number 38 while the new quiz show went to the number 2 slot within a few weeks. Genuinely concerned about the effect of the competing show on his audience, Allen posted a bond to guarantee a \$5,000 prize to anyone listening to his program who missed an opportunity to answer a *Stop the Music* call correctly. There were several fake attempts to collect, but no genuine payoffs. But the result was that Allen went off the air in June 1949 as the quiz show mania took over much of radio’s network audience.

Radio Drama at Its Height

In the postwar years, there was an increase in radio “thriller” programs, aimed primarily at school-age boys (see Appendix C, table 6). Popular programs were *Challenge of the Yukon* (with Sergeant Preston of the Royal Canadian Mounted Police and his dog King, around the turn of the century), *Sky King* (a modern rancher using his airplane, the “Songbird,” as well as a convenient pair of young relatives with whom the audience could identify), *Roy Rogers* (the singing cowboy star), *Straight Arrow* (a western with an Indian point of view), *Mark Trail* (as much nature education as adventure), and *Space Patrol* (young cadets learning the ropes in a future century). Traditionally, the thrillers were “stripped” or “across the board” at the same hour five days a week after school and had the serial element of suspense—hanging from one episode to the next. They were often the focus of radio and cereal package premium offers or items enclosed in cereal boxes. Some of the programs made the transition to television quite well—*Sky King*, *Roy Rogers*, *Superman*, *Lone Ranger*—while others—*Jack Armstrong*, *Captain Midnight*—either lasted on video briefly or did not make the move at all.

Several programs for parents and older children also soon transferred to television. Crime-detective drama included *Sam Spade*, *Dragnet* (low-key police realism in Los Angeles), and *Lineup* (police work in San Francisco). Comedy was also strong, especially the new *Our Miss Brooks* (Eve

Arden as a long-suffering high-school teacher who loves a biology instructor from afar). While most of these shows were off radio by 1952 or 1953, a few went to television for lengthy runs. Then, they faded out for years, only to be revived for a new audience in the 1970s fascinated by nostalgia. People who remembered the shows, or people too young to have heard them originally, became dedicated fans of shows and often stars long gone. They traded or sold tape recordings of old shows, and old radio programs played in the evening, usually on selected stations in larger markets, drawing sizable audiences, especially college students, from prime-time television. As noted in Chapter 9, a few original dramatic presentations for radio appeared in the 1970s, but the late 1940s marked the height, and 1970s radio drama was mostly not-so-instant replay.

radio to television, and the decline of national radio and the rise of network television produced some programming changes and trends.

7•61 *Decline of Network Radio*

Before radio networks disappeared from the scene, they had two or three very good years—and before they succumbed had a lively knockdown fight over top stars and their shows. Television helped instigate the radio “talent raids” of 1948–1949. CBS started them when it realized that it was left behind in the race for television affiliates.

Always with a bent for showmanship, CBS, realizing that radio stars might also become popular on television, came up with a novel interpretation of the tax laws. If a star formed a corporation with himself or herself as the major asset, employee, and stockholder, the network could then purchase control of the program from the corporation for a great deal of money and the star would pay a tax on capital gains rather than on straight income, which was more heavily taxed. The first major acquisition came in September 1948, when CBS “stole” *Amos ‘n’ Andy* from NBC in a \$2 million deal with stars Freeman F. Gosden and Charles Correll. CBS then enticed Jack Benny and Edgar Bergen (“Charlie McCarthy”) from NBC, and Bing Crosby from ABC. The *Ozzie and Harriet* show and Red Skelton also went over to CBS before other stars started getting better deals from their own networks. Many of the CBS contracts were personally negotiated by CBS Chairman William Paley. The networks tried to counter one another’s gains with lawyers and also with advertising and promotional battles in the press. Most of these changes took place in the 1948–1949 sea-

son—coincidentally, the first network TV season—but continued into the following year, when NBC came back with offers to CBS stars and managed to hire away Groucho Marx, Bob Hope, Kate Smith, and Ed Wynn with their respective shows. To prevent further migrations, the respective networks hurriedly placed under long-term contracts each program and star then working for them. Ironically, none of this had a lasting effect on network radio, all but defunct within five years, but strengthened CBS’s financial and programming resources for television.

Radio’s trend toward cheaper music and quiz shows, as opposed to drama, in prime time was one indication of increasing psychological pressure from television. *Stop the Music* (see page 273), a big money show based on music, was followed by *Break the Bank*, *Hit the Jackpot*, *Sing It Again* on the networks and similar programs on local stations. While most network variety and straight music shows used live bands, the local stations, and soon ABC, began to use transcriptions, breaking the old taboo on recorded music over network radio. Music, which always had been strong in local radio, now penetrated daytime network programming. The late 1940s saw development of the *musical clock* format of music, weather, time checks—hence the format’s name—news on the hour, and commercials. A local *disc jockey* ad-libbed chatty background material. Indeed, the concept of the disc jockey as opposed to the anonymous, regimented studio announcer began to grab hold in local radio in these years, as declining network programming left stations to their own devices. From a mere announcer playing records, making commercial announcements, and introducing news and other program segments, the *jock* began to build his own on-air personality, reaching informally out to the audience, tailoring

Types of Radio Programs Broadcast in 1946 / Shown below are the program types broadcast by 85 sample radio stations representing all types of AM stations in all sizes of markets, for a week in November 1946. Compare this table to the slightly different data for 1932 (page 120), and 1925 (page 73) to see the continuing major role of music, the increase in drama on the air, and the great increase in news and public affairs programs. This table includes both networks and local programs.

Program Types and Subtypes	Percentage of Time
Music	41%
Old familiar and western	7%
Popular and dance	26
Classical and semiclassical	8
Drama	16
Daytime serials	6
Mystery	3
Comedy	2
Other	5
Other Entertainment	14
Women's (homemaking)	1
Comedy and variety	7
Quiz and audience participation	6
Information	23
News and commentators	13
Sports of all types and formats	4
Talks	3
Farm programs	2
Forums and panels	1
Other	8
Religion and religious music	6
Unclassified miscellaneous	2
Total	102% (error due to rounding)

For large stations, about one-third of the schedule was local and live, about one-quarter was recorded or transcribed, and the remainder was network material. Non-network stations devoted nearly two-thirds of their schedules to recorded material, chiefly music. Of the full sample of 85 stations, about one-third of the time on the air was sustaining, with little variation by station size. For all but the largest stations, most news came from the networks.

*Source: After Kenneth Baker, Table 4 "An Analysis of Radio's Programming," in Paul F. Lazarsfeld and Frank N. Stanton, eds. *Communications Research 1948-1949* (New York: Harper & Row, 1949), pages 51-72, mainly page 58.*

music and other elements to build that personality. Though the heyday of such a role was yet to come, the basic idea was set. On New York stations such programs as *Milkman's Matinee* and Martin Block's *Make-Believe Ballroom* were popular. On smaller stations, to the unhappiness of unions and the joy of station management, disc jockeys ran their own control boards and played their own turntables, without the help of an engineer—a combination or *combo* of duties that was to become the rule for radio.

Much of the music on networks replaced faltering daytime serials. While ratings of the long-running titles remained strong, attempts to begin new serials met with little success. Loyal audiences kept this type of program on the air, but fewer people listened than before and during the war. Competing with the soap operas was an increasing number of music, quiz, and human interest programs. One of them, which ran for years on radio and later on television, was *Queen for a Day*, which started on Mutual in 1945. Host Jack Bailey would pick women from the audience who had sad tales to tell, and the audience would applaud according to how miserable a particular life was. The woman garnering the loudest applause measured on a volume meter was crowned queen for that day, and got prizes and, to the extent feasible, whatever she had requested to make her life happier. This sort of participation by the studio audience was not new, but the human interest element of *Queen for a Day* was unusual.

Realizing that it would be hard to support radio programming as advertisers left for television, broadcasters toyed briefly with the idea of direct audience support—or pay-radio. Under this scheme, listeners would pay a nickel a day, \$18 a year, to hear programming without advertising. There was strong opposition, and

the plan was shelved when one of its proponents, William Benton—founder of the major advertising agency of Benton & Bowles—became U. S. Senator from Connecticut. The concept of pay-radio was revived briefly in 1947–1948 when several stations expressed interest in a home music service based on patents of the Muzak Corporation, but opposition and lack of favorable interest killed the idea.

The only noticeable trend in radio programming during this period was the slow decline in total network programs and the increase in sustaining programs. A typical network affiliate now originated more programming than it took from the network—a reversal of the two-decades-long trend of network domination. The conviction that television would soon make all radio programming obsolete gave the radio business a general feeling of foreboding. Bright young, and not so young, programming executives looked for opportunities to move over to the newer medium. A straw in the wind was the increase in *simulcast* programs in the 1950s, in which popular radio programs became television programs, with the audio portion carried on radio. Radio listeners reacted with annoyance to unexplained references or disconcerting studio laughter. Many of these programs gave the impression of waiting for the time when they could abandon radio completely.

7•62 FM: Fine Music and Duplication

FM did not offer much that was new (see 7.71). Ever since the standard (AM) broadcasters had convinced the FCC in the 1944–1945 debate that FM would develop much faster if it could duplicate AM shows, the FCC had allowed unlimited

AM-FM duplication. To protect AM advertisers from discrimination, the networks and many local AM stations took this one step farther: co-owned FM stations could duplicate AM programming only if they carried *all* AM programs and advertisements. Since about 80 percent of the FM stations going on the air in the late 1940s were owned by AM stations in the same market, most FM stations carried AM programs. This sharply reduced the motivation of the public to buy FM receivers.

The independently owned-and-operated FM stations—fewer than 90 of the more than 700 on the air—opted for inexpensive musical programs, either background music hardly ever marred by talk or ads, or classical music and commentary. They also started issuing monthly program guides, which detailed the station's offerings for the coming month and often community events as well. In some cases these guides made more money through subscriptions and advertising than advertising carried on the FM station itself.

In many ways, FM was temporarily out of the running. Whether or not it was a "conspiracy," the AM radio broadcasting industry effectively throttled FM development by making the new medium sound just like existing radio but without static and costing more for a receiver. Lacking sufficient unique appeal, FM—not surprisingly—did not attract audiences (see 7.71) and stations began to leave the air (7.22).

7•63 *Early Television Entertainment*

Of all the periods in broadcasting history, two share the excitement of audience expectancy that the American public felt toward broadcasting. The first was in the early 1920s when radio was getting

underway, the second was the period when television was beginning to reach across the country. While radio programs continued to attract large audiences, attention was now focused on the generally unexperienced television medium.

In 1945 the few television stations that had started in 1940–1941 returned to the air after wartime suspension with only a few hours of broadcasting a day, mostly on weekday evenings. Much early television programming was radio material with the addition of limited visual elements. Except for some theatrical or short subject films, most programming was live. From 1946 to 1952 television spread into daytime and weekend hours, started to use many different kinds of programming, mostly entertainment formats that had developed on radio, and became dominated by the networks.

As new stations increased competition in a few large markets, and as more television receivers were sold (see 7.72), stations began to offer programs in the afternoons. By the early 1950s, most stations were on the air in the morning and on weekends as well. The increased air time called for more programming material—again, usually local and live. Every station had its cooking expert; a late afternoon children's program host, usually a cowboy or a clown; a general interview host for daytime shows; and a small local news staff. Local programming filled daytime hours and weekend mornings, and networks filled evening hours.

Prior to fall 1948, however, all television programming was local, with only an occasional special event being carried by more than one station at a time. Even network-owned stations operated as local independents. But, thanks to the operators' experience with radio's formats and talent, program variety, even on local sta-

tions, quickly approximated radio's, with music, variety, drama and comedy, quiz and other audience-participation shows, newscasts, and special events.

At the same time, video experimented with format, as radio had in the 1920s. Even early limited-length schedules had program hours to fill, and nearly anything could be tried as long as it did not cost too much; television was losing money in this period. Technicians, creative programmers, and performers had an exciting time trying, changing, and discarding formats. There were few restrictions or regulations. The twin aims were to fill air time and to see what would work best.

One format many television executives considered a natural was the motion picture, once the technical problem of converting 24 pictures a second to 30 was solved. But what they had in mind was the short; many doubted that the feature film would ever be available for home television. The pattern of television programming, except for sports and public events, fell into 10- and 20-minute segments rather than radio's 15-minute program pattern. Indeed, until the influx of ex-radio executives in the late 1940s, television scheduled programs in multiples of 20 minutes—long enough for two film reels of 1,000 feet on 35mm and a couple of commercials. Television programmers were uncertain as to how long audience attention could be held. With radio one could use imagination, but with television the audience had to pay total attention, which they believed any program an hour or longer could not command. In addition, the motion picture industry, alarmed over the growth potential of television, refused to sell any post-1948 and very few earlier movies for television showing. This visual media competition increased in the 1950s (see 8.6 and 8.91).

Network programming dominated most evening hours on television from the start, and gradually expanded to daytime and weekends. Program managers quickly learned to fill local off-hours with the least expensive fare they could find—usually short films or off-network or independently produced and syndicated programs. They also ran old network output in fringe hours—a trend which was to increase in importance during the 1950s and 1960s as more old programs on film or videotape became available for reruns.

There was no question that advertiser-supported entertainment would be the basis of television programming just as it had been in radio. Because of its higher costs, getting the largest possible audience was even more important to video than radio, as the key to attracting advertiser money. The NAEB survey of a week's programs on New York's seven stations in January 1951 (see box) showed that of 564 hours telecast, 25 percent was drama (including 10 percent police/crime and 6 percent western), 14 percent was variety and vaudeville, 13 percent was entertainment for children, 10 percent each was sports, homemaking, and interviews/news, while only 3 percent was informational apart from news. The week covered offered little important programming and only one hour of serious music. Advertising was heavy, especially in the daytime and particularly on the Dumont and NBC stations. A year later the researchers found that crime shows had increased to 15 percent of the total for New York, thus giving 25 percent of the programs over to what the NAEB termed portrayals of lawlessness—crime and western combined—while variety shows had declined. The NAEB later found basically similar conditions in Los Angeles and Chicago television: predominantly entertainment with emphasis on action-ad-

venture drama. Advertising took up about 20 percent of the broadcast time in Los Angeles compared to about 15 percent in New York, including some program-length pitches.

The industry's own major awards stressed entertainment too. The annual Emmy Awards, named after the image orthicon television camera tube, or *immy*, were first made in 1949 for the previous season. They covered only Los Angeles stations for three years and honored entertainment programs only. Six awards were made in 1949 and 11 in 1950. In February 1952 the awards attained coast-to-coast coverage and applied to national content. Six awards that year went to entertainment programs and one to Senator Estes Kefauver (see 7.64).

With the single exception of sports broadcasts (see below), variety programs were more abundant on network television evening prime time than any other type during this period. And, just as radio networks had prospered with *Amos 'n' Andy*, so did television expand on the antics of Milton Berle. Labeled by extensive publicity as "Mr. Television," or "Uncle Miltie," Berle was the host and chief screwball of *Texaco Star Theater*, which began on June 8, 1948, and was amazingly popular—far more popular than the Fred Allen radio program with the same name for the same sponsor—for the next five years. Berle knew how to use the visual "sight gags" possible only on television and was happy to make a fool of himself. He delivered one-liners and topical jokes, used weird costumes and settings, and had top-flight guest stars who joined in the antics. For an audience becoming used to television, the combination was highly entertaining.

A calmer version of the variety show—actually, closer in spirit to vaudeville—was *Toast of the Town*, which began

on June 20, 1948, with Broadway gossip columnist Ed Sullivan as host and lasted more than two decades as the *Ed Sullivan Show*. Sullivan was wooden and ill at ease in front of a crowd, but he had a talent for selecting stars, potential stars, and other acts for his program. The very first program featured the then little-known comedy team of Dean Martin and Jerry Lewis, making their television debut amidst a classical pianist, the Broadway composer-author team of Richard Rodgers and Oscar Hammerstein II, and a boxing referee. This mixture of high culture, popular interest, and three-ring circus became the hallmark of several television shows, all modeled to some extent on Sullivan's.

Many other long-lasting television stars started in these early years of network television. Garry Moore began a daytime variety show in 1950 and has been on television in various capacities ever since. In Chicago, *Garroway at Large* began in 1949, a low-key program epitomizing the "Chicago School" of television and reflecting the low profile approach of Dave Garroway. Three years later, Garroway was the initial host on NBC's *Today* show. Suffering at first from its early hour of 7 A.M. (ET) and perhaps excessive gimmicks, this live two-hour combination of news, weather, features, interviews, and some performances, programmed with short lengths of viewer attention in mind, made *Today* a lasting fixture. *Today*, and its sister *Tonight* show, hosted over the years by Steve Allen, Jack Paar, and Johnny Carson, are good examples of unique television formats—both devised by NBC's brilliant network chief of the early 1950s, Sylvester "Pat" Weaver.

Another rapidly accepted staple of early television was the talent contest, a radio holdover made more interesting to both performer and listener by the addition of sight. In 1949 television won over

the long-running *Original Amateur Hour* (see 5.61), now under the direction of Ted Mack, and radio personality Arthur Godfrey's *Talent Scouts*. Both programs were to last a decade or more on network television, spurring some local station copies.

A common musical format of early television was the 15-minute or half-hour filler show—though few called it that then—featuring a singer or orchestra playing popular music interspersed with ads. Local stations offered such programs because they were simple and inexpensive to produce, with few or no guest stars or other gimmicks. Some programs were built around well-known orchestras—Paul Whiteman, Wayne King—and singers—Vaughn Monroe, Kate Smith—but other programs created stars. One was a former Pennsylvania barber named Perry Como, whose relaxed informality—he looked out of place in a necktie—brought him a network program in 1950 after two years as a featured personality in a variety show. However, some well-known performers did not “make it” on the intimate medium of television. One was Frank Sinatra, fresh from a spectacular recording and radio career, who did not do well in television in 1950–1952.

A musical program built more on an idea than on its stars—one of whom was Sinatra—was *Your Hit Parade*, which had run for 15 years on radio when it moved to television in 1950. The program played the top-selling tunes of the week selected by a “survey,” plus a few extras. Extensive sets and dances helped maintain interest, especially when the same tunes were in the “top ten” for weeks. When the faster paced rock music came in, often instrumental and dependent for success on the styling of a particular artist or group, this type of program went into decline.

As on radio, little “serious” or classical music appeared on television. *Voice*

of *Firestone*, beginning in 1950, was one of the few such programs regularly shown. Although it was attractive to its sponsor and audience, the network killed the program because the audience was too small to provide audience flow to adjacent programs. A cultural highlight of television's early years was Gian Carlo Menotti's opera, *Amahl and the Night Visitors*, which was commissioned by NBC and first shown on Christmas Eve 1951. An estimated five million viewers, at that time a sizable audience, viewed it in the first of many Christmastime showings.

Music and variety formats were important from the start but never dominated the medium as they did radio. Although they were “good television,” they were expensive and not specially suited to the visual element of television. The particular advantage of variety and musical programs in the early days of television was that they could be simulcast on radio with little or no loss in content.

The situation comedy rapidly became a mainstay of television programming. A number of such programs came directly from radio in 1948 and 1949, with others following later. Among the most popular programs were the *Life of Riley* with William Bendix, one of the earliest programs dealing with a blue-collar worker; *Our Miss Brooks*, a wisecracking teacher played by Eve Arden; *The Goldbergs*, written by and starring Gertrude Berg in a Jewish, New York setting; and *Amos 'n' Andy*, with black actors playing the leads instead of originators Gosden and Correll. The last left the air finally in 1966 because blacks resented the stereotypes and whites never related to it as they had to the radio version.

I Love Lucy appeared in 1951 and set a standard for television comedy for decades to come. On the surface, it was just another situation comedy, but the

Changing Patterns of Television Programming: 1951–1954 / The most extensive analyses of early television programming were the series of programming studies conducted and published by the National Association of Educational Broadcasters. Here are the major findings of those content analyses.

Program Type	New York		Los Angeles	Chicago	New Haven
	1951	1954	1951	Summer 1951	1952
Drama	25%	38%	26%	26%	24%
Comedy	3	9	3	3	4
Crime-detective	10	13	8	5	9
Western	6	4	6	6	—
Domestic/romance	5	4	5	1	9
Other drama	1	8	4	11	2
Music and Variety	18	15	16	12	19
Serious (classical)	1	1	—	} 3	} 4
Popular and light music	3	6	6		
Variety programs	14	8	10	9	15
Other Entertainment	12	8	8	15	11
Personalities	5	3	2	8	1
Quiz shows	7	5	6	7	10
Information	31	24	39	39	36
News	5	6	12	5	12
Weather	—	1	—	1	—
Public discussions and events	2	3	2	3	1
Other information	4	2	4	2	6
Sports	10	5	5	21	11
Homemaking	10	7	16	7	6
Other	14	14	11	8	9
Religion	1	2	1	—	1
Children's shows of all types	13	12	10	8	8
Total	100%	99%	100%	100%	99%
Number of stations:	7	7	8	4	1

Source: *Los Angeles Television: May 23–29, 1951*, by Dallas W. Smythe and Angus Campbell. (Urbana, Ill.: NAEB, 1951), pages 6, 79; *The Purdue Opinion Panel, Four Years of New York Television: 1951–1954* (Urbana, Ill.: NAEB, 1954), pages 69–75; Donald Horton, Hans O. Mauksch, and Kurt Lang, *Chicago Summer Television: July 30–August 5, 1951* (Urbana, Ill.: NAEB, 1951), pages 15, 25, 27, 55; and Dallas W. Smythe, *New Haven Television: May 15–21, 1952* (Urbana, Ill.: NAEB, 1953), page 106. © National Association of Educational Broadcasters. By permission.

combination of the zany Lucille Ball, her Cuban husband Desi Arnaz (until they were divorced in real life), and a fine supporting cast instantly gave it a high rating. Under varied titles and with changes of cast, the show stayed on the air until the 1970s. One show was particularly memorable—when nature and art combined to have Lucille Ball and “Lucy Ricardo” give birth during the same week. Many years later, the son joined the cast. Another long-lasting situation comedy reflected something of a real life marriage. *Ozzie and Harriet*, formerly a radio program (see 6.65) starred the real family of bandleader Ozzie Nelson.

Other comedy also caught on, particularly programs such as Jack Benny’s,

or (George) *Burns and (Gracie) Allen*. On television, these programs were a mixture of situation comedy and variety. One of the best was *Your Show of Shows*, a variety format with inspired sketches by Sid Caesar, Imogene Coca, and a supporting cast that included Carl Reiner. The unusual 90-minute format focused on Caesar’s satiric commentary on everyday life, and became such a classic that a film put together from old kinescopes was successful in the 1970s. Bob Hope did stand-up humor and slapstick sketches on several programs before his own *Bob Hope Show* debuted in 1952. Except for some of the longer variety formats, the television comedy show dealt for a half-hour with a narrow range of predictable, but often funny, situations fea-

Radio to Television: The Goldbergs / Running on CBS television from January 1949 to September 1953, *The Goldbergs* was based on the long-running radio series about the daily lives of a poor Jewish family in the Bronx. The program was built around the character of Molly, played by program creator Gertrude Berg, shown here with Eli Mintz playing Uncle David. Photo credit: Culver Pictures, Inc.



The Great TV Comedy Teams / Two mainstays of network television programming in the 1950s were the situation comedy—epitomized by Lucille Ball (shown here in the original *Love Lucy* with then husband Desi Arnaz and William Frawley as Fred Mertz)—and the comedy-variety show, one being *Your Show of Shows*, in which Sid Caesar and Imogene Coca brightened television with sophisticated team humor.



Photo credit: Culver Pictures, Inc.



Photo courtesy of National Broadcasting Company, Inc.

turing actor-comedians, frequently unknowns, of varying quality.

Another early television genre was the half-hour crime-detective show, long a radio staple. The best known was *Dragnet*, which began on television in 1951 with a low-key, starkly realistic portrayal of a Los Angeles police team at work. Its musical theme became instantly recognizable, and its approach, use of jargon, and true-to-life characters became a model for many police-based series. Most other early shows, some of which had transferred from radio, were low-budget and relied on violence, before it was of much concern, rather than on plot or characterization.

However, these first years of network television are perhaps best remembered for their path-breaking work in prestige anthology drama. In the 1948–1949 season *Studio One*, *Philco Playhouse*, and *Kraft Theater* all went on the air live for a half-hour or more each week. “Anthology” programs used a different cast and story each week, staying away from the stereotyping and restrictions of the weekly serial or situation series. Many present television stars, and a number of film and stage personalities, entered television in these programs. Slightly less prestigious were anthology series hosted by a movie star; Ronald Reagan for *Death Valley Days* or Loretta Young, who might play a role in several shows a year. *Studio One*, on CBS, programmed adaptations of novels, stories, or plays, while *Philco Playhouse* aired original drama. These and other drama programs provided a valuable outlet and training ground for stage or radio actors and new plays; the legitimate theater and television were much closer at this time than the motion picture industry and television, partly because most television production was in Broadway’s backyard. By 1951 16 anthology series, each presenting a different live drama each week, made

up 12 percent of prime-time programming. While such programs had great audience appeal at first, partly due to the higher income and education of early set owners, anthology audiences began to drop off as program costs doubled from 1949 to 1952 and a larger audience wanted diversion rather than serious drama.

Most early programming for children of school age also used the dramatic format. One popular format was the western program—there were no “adult westerns” until the mid-1950s—including *Hop-along Cassidy*, *The Lone Ranger*, and *Cisco Kid*. Originally network programs, they have returned over and over again in syndication. A few of these, produced by far-seeing creators, were shot in color and had a revival in later years, when color telecasting came along. Another children’s program type was the science-fiction thriller such as *Captain Video*, *Tom Corbett*, *Space Cadet*, or in modified form, the first (1950) television version of *Superman*. This series, based on the hero of radio, comics, and films, was another example of the universality of a good archetype or gimmick.

A favorite of the youngest audiences was the children’s equivalent of the variety show: circus, puppet, or animal. Some of them were *Super Circus* (1949), with music, circus acts, animals, and, of course, clowns; the immensely popular *Howdy Doody*, which began in New York in 1947; and the appealing *Kukla, Fran, and Ollie*, a Chicago product with the very human Fran Allison and two Burr Tillstrom puppets. Although attracting adults as well as children, *Kukla, Fran, and Ollie* did not have the audience size of *Howdy Doody*, which featured a western puppet character, host Buffalo Bob Smith, Clarabelle the clown, and a “peanut gallery” of children in the studio. It was a late afternoon “must” until 1960, and Buffalo Bob Smith was able to tour colleges successfully in the early

1970s, reaching the same audience. In 1952 a program aimed at the youngest preschoolers, *Ding Dong School*, offered the conversation, low-key instruction, commercials, and entertainment of Miss Frances, a former professional teacher.

The remaining important format as to time on the air and audience size was sports programming. Boxing, basketball, and bowling were most common in 1948–1949 but dropped sharply within four years. The Wednesday and Friday night prizefight telecasts, together with baseball's World Series and special events in golf and racing, enlarged television's audience in neighborhood bars more than almost any other format. Throughout this period, wrestling and roller derby matches offered more spectacle than sport, and their stars became well-known personalities. These programs, often scripted, were not intended as pure sports contests; wrestling, in particular, was often played as melodrama.

Quiz and panel programs came over from radio as mainstays of both evening and daytime television programming. One of the first was the Goodman-Todson production firm's *What's My Line?*, which began in 1950 and was still showing in syndicated form in the 1970s. Somehow, its panel of articulate celebrities trying to guess a contestant's occupation has held audience interest all this time. Others of this genre were *I've Got a Secret*; the *Quiz Kids*, featuring child prodigies and playing more on human interest than knowledge; *Beat the Clock*; *Strike It Rich*—the show with a "heart line" for announcement of donated special prizes for those with tear-jerking problems; *Truth or Consequences*; and *Queen for a Day* (see 7.61). Groucho Marx's *You Bet Your Life* was more a vehicle for Groucho's talk and gags than a true quiz show. Appealing to many who like quiz programs was *This Is Your Life*, where

host Ralph Edwards surprised a famous personality by confronting him or her with persons from the past, who would tell the personality's life story and engage in tearful reunion.

7•64 *Rise of Television Journalism*

Radio news in the 1946–1952 period was dominated by the newsmen who had reported World War II. Edward R. Murrow, the best known, became a CBS network vice president and member of the board—positions he soon gave up for full-time news work on both radio and television. Network and local newscasts, a legacy of the immediate prewar and war years, continued although reduced in number of hours from the wartime peak. The audience still turned to radio for fast-breaking news. News veterans who broadcast into their second and even third decades were Drew Pearson; Edwin C. Hill; Fulton Lewis, Jr.; Gabriel Heatter; Lowell Thomas, whose nightly news program on NBC and later CBS lasted from 1930 to 1976; and Walter Winchell, who often spoke more gossip than solid news. One of the more famous and long-running news interview programs, *Meet the Press*, began during this period, and so did *Capitol Cloakroom*, which presented interviews with senators and representatives.

Both NBC and CBS televised daily 15-minute newscasts in the networks' first season. The NBC *Camel News Caravan* had John Cameron Swayze narrating clips of newreel film, while *Douglas Edwards with the News* did the same on CBS. Swayze was to last until 1956 and Edwards until 1962.

Supplementing regular newscasts was a series of special events. In 1951 television covered the welcome given General Douglas MacArthur after President

Truman had relieved him of command in Korea, and the closing ceremonies of the San Francisco peace conference that officially ended the war with Japan. Perhaps the televising of the 1950–1951 Senate hearings into organized crime in the United States made the greatest audience impact. As the little-known Tennessee Senator Estes Kefauver chaired hearings for weeks in various parts of the country, viewers saw the world of organized crime unfold. The high point was the testimony of reputed gangster leader Frank Costello, who demanded that the cameras stay off his face—so they focused on his hands instead. The nervous movement of the hands, tied to what he was saying, clearly portrayed a man under extreme pressure. These hearings informed the country about organized crime—and catapulted Kefauver into the limelight in time for the 1952 presidential race.

The first television public-affairs series on a network was *See It Now*, hosted by Edward R. Murrow and produced by Fred W. Friendly, the same team that had created radio's *Hear It Now*. Beginning in 1951, this weekly half-hour program usually focused on a newsworthy and often controversial (see 8.64) person or news event.

7•65 *Election Broadcasting*

Another indication of the passing of an age was the 1948 election campaign. That radio still could make or break candidates was demonstrated in a Portland, Oregon, debate between Harold Stassen, former governor of Minnesota, and front-running Governor Thomas E. Dewey of New York, both Republican presidential candidates. The two men debated whether the Communist party should be outlawed. Stassen, soundly trounced for his poorly

expressed liberal views, subsequently lost the primary to Dewey. Given the political realities of that year, at the height of the cold war with the Soviet Union, both Dewey and the polls figured he had the November election in the bag. But on radio, although Dewey certainly was the “better” speaker, with a more traditional “radio voice” than his opponent, President Harry S Truman, he tended to speak over the heads of his audience. Truman had the difficult task of offsetting minority party incursions from Progressive Party nominee Henry Wallace on the Democratic left and States’ Rights Party nominee J. Strom Thurmond on the right. Truman’s radio talks were sometimes abruptly cut off for lack of funds to pay for the entire program. Both sides relied heavily on spot announcements and short political programs. Truman won a famous political upset and by 1951 became the first President to allow audio recording of his news conferences—at first just for checking reporters’ notes but a few months later for direct broadcasts.

The 1952 presidential campaign was the first to be televised nationally and made available to a majority of the population, although some politicians had appeared on camera as early as 1928 and the 1948 campaign had been covered in cities with television. Both conventions were broadcast, and reporters covered pre-convention primaries. However, the highlight of the election year—ironic in relation to the events that occurred 22 years later—was the September 23, 1952 nationally televised address of the GOP vice-presidential candidate, Senator Richard M. Nixon of California. Nixon had been accused of having access to a multi-thousand-dollar secret “slush fund” given him by supporters. General Eisenhower, the Republican presidential nominee, was ready to dump Nixon, but the latter asked for a

chance to clear himself. That night Nixon, speaking without notes, explained his financial condition in a half-hour, emotional address later called the “Checkers” speech, because of its reference to a pet dog his daughters had been given and which they were going to keep “no matter what.” Listeners reacted to the speech with telegrams and calls urging the GOP leaders to keep Nixon on the ticket. The rest of the election was predictable, although neither major candidate came across well on television: Eisenhower because he bumbled and often misspoke or mispronounced words, and Illinois Governor Adlai Stevenson because he often spoke over the heads of his listeners. In Massachusetts, Congressman John F. Kennedy won a Senate seat against incumbent Henry Cabot Lodge after a series of televised debates. The television networks provided detailed election-night coverage for the first time. Nationally, the 1952 campaign proved the value of television spot advertisements for making voters aware of candidates rapidly and was the start of politicians’ concern with television *image*.

In five years or so, television networks and stations had developed most of the program formats the medium would use for decades to come. The prior existence of radio had enhanced the growth of television, which used many of the same shows and performers—particularly in these transitional years when many shows were presented on both media at the same time.

7·7 The Increasing Demand for Broadcast Services

Audience attention immediately after the war focused not on television but on radio. Television was no closer in 1946 to most Americans than it had been in 1941

when only a few cities had stations and a few thousand people had receivers. Readers of magazine and newspaper stories knew about television, but immediate ownership was beyond most people. Far more concern centered on radio—how to get those old sets repaired or replaced. After four years of war there was a tremendous demand for radio receivers—and everything else.

7·71 Meeting the Continuing Demand for Radio

As can be seen in Appendix C, table 8, the number of radio families increased by nearly 10 million in the seven years under discussion. In the same period, the number of cars with radios more than doubled so that, for the first time, by 1951–1952 a majority of cars had radio. These bare figures hide a number of interesting developments.

Virtually all manufacturing effort was put into the AM market in the post-war 1940s. More than 50 million AM receivers were made in 1946–1948 alone, to replace older sets and satisfy the major immediate postwar demand. The phenomenon of the multiset household bloomed: as radio prices came down, the number of sets per household increased. Bedrooms and kitchens now contained small \$15 table model receivers with plastic cases and simplified internal circuitry, in addition to larger sets in living rooms.

For FM radio, the story was different. Two things combined to hold down receiver production: the 1945 allocation change for FM, which forced major reengineering by the manufacturers, and the great demand for AM sets. Naturally, with all major companies tooled up for the ready-made AM radio market, it got precedence. While more than 50 million inex-

pensive AM sets came off the lines, FM production was limited to only 2.9 million units in the 1946–1948 period—less than 6 percent of AM production. Furthermore, FM sets cost \$50 or more, as they were more complicated and manufacturers had start-up costs to recover.

Much FM production was limited to large and expensive console radios and television sets. Because the new FM band was located just above VHF television channel 6, and because television's sound system was FM, about one-third of the television sets made in the late 1940s had FM radio reception capability built in. This proportion dropped to 20 percent by 1952 and disappeared a few years later. As FM's fortunes waned, FM trade groups and set makers tried to promote FM receiver purchases, but few urban areas had more than 10 percent FM set penetration by 1952. Caught between the lack of audience and too few stations to attract any, FM broadcasting found itself unable to break the vicious circle before the 1960s (see 8.21).

7.72 *Trends in Television Receivers*

Unlike AM and FM radio, television had to build its postwar audience from scratch. Of the perhaps 8,000–10,000 receivers in use before the war, only part were still working when peace came. In 1946, some 6,500 were made and sold in New York, Los Angeles, Chicago, Philadelphia—communities that had stations on the air at that time. Television set manufacture started slowly because of lack of facilities due to AM demand, supply bottlenecks—picture tubes, for example—uncertainty over final spectrum allocations (see 6.82) and the possibility of black-and-white obsolescence due to color, and the chicken-or-egg relationship between high prices and consumer demand. Picture

tubes, blown and shaped by hand at first, could not be made in quantity. Some early sets were sold in kit form to meet demand and reduce price. Dumont announced the first postwar television receivers for sale in May 1946, followed several weeks later by RCA. Philco came into the market in 1947 and many others by 1949, although the sales process was confused and unorganized.

A television set was a sizable investment. The typical 5-inch to 7-inch receiver cost from \$375 to \$500 in mid-1948—several weeks' pay for the average worker. In addition, the buyer paid an installation fee ranging from \$45 to \$300, depending upon antenna requirements, and usually invested in a one-year service contract and a roof-top antenna, especially in cities more than 30 miles from the transmitter. Fully three-fourths of early receiver production went to East Coast cities; half to New York. The small screen sizes led to a brisk market in large magnifiers, costing from \$10 to \$60 each, set in front of the receiver to enlarge the picture. In 1949 and 1950, larger screen sizes were made, with the 10-inch set becoming the standard, although Dumont, long a leader in this area, offered a \$500, 20-inch tube (not complete set) as early as 1947. Zenith introduced a set with a circular picture—actually almost all tubes were circular but covered with a rectangular mask—and garnered a good portion of the market in 1949–1950 before rectangular tubes were marketed. Although the screen looked larger, the circular shape chopped off much of the sides of the rectangular picture being transmitted. As set sales increased and competition became stronger, the cost of receivers dropped so that a typical small-screen set cost only \$200 by the early 1950s. Manufacture was slightly limited after 1951 by the Korean War military equipment demands (see 7.821).

Early Postwar TV Receivers / As noted in the text, early television receivers were not inexpensive, often costing several hundred dollars. These newspaper ads taken from metropolitan papers give an idea of what was available for what price. All sets then were black and white.



9-PC-41
Projection model **\$795**
Plus \$1.01 Fed. Tax



New Zenith TV Console
Model 2438R. 165 sq. in. "2-in-1" screen. 18th century cabinet, mahogany veneers and hardwoods. Only

\$319.95
Plus Fed. Tax

Motorola

TABLE
MODEL
TELEVISION
WITH
BIG 16-INCH
PICTURE!



- Big-as-life pictures on 16-inch rectangular tube!
- Easy to operate. Just two simple controls!
- Built-in antenna gives powerful performance!
- "Performance Tuning" to insure you long, dependable service!
- Beautifully styled, modern, no-out-of-habit-to-notice!
- Pictures clearer than ever, just as the TV camera "sees" them!

MODEL 17-T-3
\$219.95
Plus Fed. Tax

Big 12½-Inch Television!

new
"BROADVIEW"
SCREEN
gives 25% more
picture area



SIMPLIFIED
CONTROLS
even a child
can operate it!

**Brighter,
clearer, steadier pictures**

by *Motorola*

Here's a big screen permitting an entire roomful of people to see comfortably. Features the new BILT-IN-TENNA—no installation in "good signal" areas. Here's cabinet beauty to complement your lovely furniture. Hand rubbed to satin-smooth "piano finish." Mahogany or blond. See it, hear it, compare it today. **CONVENIENT TERMS.**

Model **\$279.95** \$6.00 in. Plus Fed. Tax
Shown Only includes 1 year
guarantee and tax.

Still, the television audience increased (see Appendix C, table 9) from almost zero to more than one-third of the nation's homes in the few years covered in this chapter. As the number of set owners grew, the market became more organized and inadequate manufacturers and sales organizations were squeezed out. The installation charge came down sharply or was eliminated. In 1952 not only was a television receiver a far better product, with a much larger screen, but it sold for perhaps half of its 1948 price. Most people saw their first television program in a public place, either a store window or a neighborhood bar—"We have TV" signs were a surefire come-on, especially just before a major sports event. With that initial exposure and increasing advertising by television stations and sales outlets, a few families made the plunge—and then more followed.

The receiver soon dominated the early television home. It usually went into the living room, relegating radio to another room, and became the center of attention for the family, and their non-television-owning friends. Some families without sets installed outside antennas in order to keep up with their neighbors. For the first week or two the family looked at virtually every program and marveled at the phenomenon. Slowly, the fascination declined, and individual family members began to watch specific programs. In a very short time, television replaced most radio, reading, and weekend movies—to the detriment of the other media.

Television's expansion was much faster than radio's: radio had taken a decade to reach a 33 percent penetration, but television managed it in only seven years. Initially, the large cities and the Northeast generally had more sets than elsewhere. Although people in rural areas without stations, particularly in the South and

Midwest, went to great lengths to receive distant signals, these regions naturally had the slowest rate of television set sales.

7•73 *Developments in Audience Research*

In the late 1940s, the last years of AM radio hegemony over broadcasting, two excellent major surveys of public attitudes toward radio and its content appeared, both under the direction of Paul Lazarsfeld. *The People Look at Radio* (1946) showed that the vast majority of persons surveyed in 1945 thought the radio did a good or excellent job, ranking higher than the churches, newspapers, schools, or local government. An expanded and updated survey published in 1948 as *Radio Listening in America* showed that, while television was just getting underway, the majority of listeners still liked radio, but it had slipped in favor of newspapers as the prime source of news now that the war was over. These volumes provide a useful picture of the radio audience just before television radically changed audience habits and views.

Prior to 1950, radio ratings were dominated by C. E. Hooper's "Hooperatings," based on coincidental telephone call surveys. With the coming of television, A. C. Nielsen's meter-produced ratings (see 5.73 and 6.72) began to cut into Hooper's near-monopoly. Clients endlessly debated the merits of the two systems. Advertisers and broadcasters complained about having to pay for two different services doing the same job, and Hooper began losing clients to Nielsen. Early in 1950 Nielsen purchased the other's national rating service, leaving Hooper free to work in local individual markets but giving Nielsen a virtual monopoly over national television

ratings. Nielsen has provided meter-based national television ratings ever since, although other companies later came into the field (see 8.72).

Until 1952 most research into television viewing habits was eminently practical: who owned sets, how much they watched, and what products and services they bought. A New York advertising agency began systematically and periodically to poll a New Jersey town of 40,000 people (dubbed “Videotown”) near New York City to see how television was changing the population’s lives. The surveys showed high satisfaction with television and increasing amounts of time spent watching it daily. Families tended to stay together more of the day because of television, but researchers realized after a while that a family watching television together did not necessarily communicate more; they just sat in silence and watched, sometimes with their television-less visitors.

Television was recognized as different in many ways from radio. For one thing, since it required less imagination than radio, it focused attention more than radio. Television made personalities appear more human when seen as well as heard, gave the viewer a sense of sharing in events, and appealed to young children. These capabilities forewarned social scientists of its potential impact on families and American life.

Each of the networks issued research reports for agencies and affiliates, and these today make excellent snapshot views of television’s progress. They show that the early television-owning American household was not typical but had a higher income, needed for the purchase of expensive receivers, and above-average education. Early audience profiles also showed that television-owning families were larger and younger, spent more time every day with television than with all other media

combined, and bought more products in general and cars and appliances in particular. But most Americans, especially those removed from large cities or the Northeast, probably did *not* own a television set.

At least one concern of the 1970s cropped up in the first days of television: its effect on young children. Suddenly the home environment harbored a medium with sound and pictures less easily controlled than other media and attractive to very young children. Television critic Robert Lewis Shayon’s *Television and Our Children* suggested that the answer to such problems lay in family control over their children’s viewing habits and in organized community action to encourage better children’s programming and less violence on the air. Such arguments grew louder in the decades to come (see 8.73 and 9.72).

7•8 Regulating Expansion

The Federal Communications Commission found itself in the thick of the broadcasting transition that marked the 1945–1952 period. Probably the most important and certainly the most time-consuming controversy was television allocation—how to apportion sufficient channels to allow a choice of content in most regions without sanctioning interference from or to stations already on the air. At the same time, the commission issued its clearest statement yet on “public service responsibility” for broadcast licensees; the commission’s staff fretted over the increasing number of radio stations trying to divide a relatively static advertising pie; a Chicago union leader was tying broadcasters into knots; and the industry was acquiescing in the blacklisting of entertainers accused of communist sympathies.

7•81 *Mess in the Making:
1945–1948*

As the war ended, there were enough television channels and enough skepticism about television's future in the smaller markets that an applicant could easily obtain a license for a frequency. However, in larger markets, particularly in the crowded Northeast, there were not enough channels. The FCC engineering staff tried to apply sound engineering standards in assigning channels to the various cities and to avoid co-channel interference by allowing sufficient geographical distance between stations on the same channel. Their plan, based on the May-June 1945 decisions (see 6.82), specified the locations at which stations could be licensed, market-by-market, and the number of stations, or channels, at each location. This would ensure some coverage for rural areas and would ease the administrative burdens on both commission and applicant, since expensive engineering surveys would be unnecessary. The only alternative would have been a grab bag analogous to the unsatisfactory AM radio solution: letting applicants fight for what they considered the best channel in the best location, no matter how many stations in other towns thereby could not be started. Since the number of channels, 13, had been determined, the only other major variable was the distance between stations operating on the same or adjacent channels. Power and antenna height were less important variables (see Appendix B, Waves, etc.). Although FCC engineers hoped to allow a margin for safety against interference by 200-mile co-channel spacing, such spacing would give New York City only four channels if the rest of the congested portion of the Eastern Seaboard was to get adequate service. This meant that New York City—always in need of

more stations because it was the nation's largest market—would not have three of the total seven channels available. (Since adjacent channels would give interference if used in the same market, only 7 of 13 could be used in any one city.) The FCC quickly found itself in a political box: New York *had* to have the maximum number of stations, yet, with Congress still dominated by rural interests, service had to be provided to smaller communities.

The compromise solution, reached after several trials, gave New York its seven channels by eliminating two of the three "community" (low-power) channels and, among other compromises, by locating (in the FCC's own words) "television stations . . . somewhat closer together in the eastern part of the United States than was done in the original Commission proposal." No allocation plan gives something for nothing. In this case, the price of seven channels in New York was neglect of the safety factors previously deemed necessary to protect television against tropospheric interference. Instead of the 200-mile separations proposed originally, the plan adopted by the commission toward the end of 1945 (see 6.82) called for separations of only 150 miles. This distance took care of groundwave interference but made no provision for the possibility, particularly at the height of the sunspot cycle, of radio waves traveling, as Armstrong and others had warned, through the lower atmosphere (troposphere) and causing very bad interference between stations on the same channel.

The FCC took steps in 1947 to solve two other problems with the 1945 television allocation plan. First, only one community channel was used solely by television; the other 12 channels were shared with the safety and special services. Although the assignments were based on mutual noninterference, this was

obviously an impossible standard. Second, establishment of television in Canada and Mexico conflicted with U.S. television.

After a number of revisions, the commission decided in May 1948 to delete channel 1 (44–50 MHz) and turn it over to the safety and special services. In exchange, the other television channels would be free of fixed and mobile services sharing. Although the television industry made a protest as a matter of form at the loss of channel 1, it generally agreed that 12 *exclusive* channels were preferable to 13 channels if 12 of them were subject to sharing. The safety and special services also were pleased at this compromise—until they outgrew channel 1 and were permitted to share some lower UHF television channels in the most congested areas and take over—together with common carriers—the upper 15 UHF channels in 1970. The border station problem was solved by international agreements governing assignments of channels to cities within 250 miles of the border with Mexico in 1951 and Canada in 1952.

The chief problem remained. As television grew in popularity, the demand for new stations became insistent. The Television Broadcasters Association pushed for the seven channels in New York City. The commission, apparently unable to foresee the consequences of its actions, repeatedly narrowed the mileage separations between stations on the same or adjacent channels. Although broadcasters were pleased to receive grants of the new channels, safety factors had been thrown away.

By fall 1948—less than three years after the television broadcasters and potential broadcasters started putting pressure on the FCC through the public and individual congressmen to get stations for *their city*—it was obvious that a major error had been made. As more stations went

on the air, and as the sunspot cycle reached its zenith, the shortcomings of the 1945 allocation table became unbearable. For example, mutual interference between stations in Detroit and Cleveland, a little more than 90 miles apart, was making reception impossible well into the heart of each city. The situation called for drastic action, of a sort not seen since the FRC acting as “traffic policeman of the airwaves” had cleaned up the AM band using the Radio Act of 1927.

In September 1948, with only 50 or so stations on the air but with an additional 50-plus construction permits outstanding, the effect of narrow separations, heightened by the sunspot phenomenon, led to a flood of complaints from broadcasters and the public that the FCC could not ignore. After hearings, on September 29 the commission “ordered applications for new TV stations placed in the pending file.” They remained there, not for the six to nine months suggested by FCC Chairman Wayne Coy, but for nearly four years. The reasons for instituting the now-famous *television Freeze* were not the only reasons it took four years to lift. The Freeze provided time for RCA and CBS to continue their fight over color television, committees to resolve the use of UHF frequencies, pressures for an educational channel reservation system to mount, and interference problems to be settled.

7•82 *The Television Freeze: 1948–1952*

The “temporary” Freeze on new television stations lasted until April 14, 1952. Although the FCC acted upon no new applications, it allowed stations holding construction permits to go on the air. The people that had television enjoyed expanded programming, but people in

other areas looked forward to the end of the Freeze as ardently as the potential licensees.

Arrayed against those wishing access to a competitive television structure were the 108 "pre-Freeze" stations, including the outlets owned and operated by the networks. This group worked in various ways to maintain the Freeze and hold off potential competition, while promoting scarcity and inequality of television channels to ensure the least competition when the Freeze eventually lifted. Manufacturers, too, were glad to sell millions of sets, using well-understood prewar technical standards, to viewers of pre-Freeze stations.

The maneuverings of the haves and have nots focused on a lengthy series of commission hearings, which determined the eventual end of the Freeze and future shape of television. These hearings covered five substantive issues, related chiefly by their differential values to the two groups involved. The issues, not in any special order, were (1) color television standards, (2) reduction of tropospheric interference, (3) possible spectrum locations for additional channels, (4) city-by-city assignment of channels and criteria for these assignments, and (5) educational television channel reservations.

7•821 Color Television Standards Hind-sight tells us that color television standards might better have been considered separately from the main Freeze hearings. Regardless of the motives of participants in the imbroglio, the color phase of the hearings delayed the end of the Freeze by more than a year. The color controversy was incorporated into the general hearings partly because it raised problems of spectrum allocation until 1949, when both CBS

and RCA managed to make their respective systems work within the 6 MHz-channel bandwidth in use for black-and-white television.

Although CBS had lost round one of its fight for a wide-band color system during the 1944 hearings (see 6.82), the setback did not stop the firm for long. While CBS's main field of endeavor had been radio broadcasting, it recognized the potential of television and wanted a place of leadership in the new medium similar to RCA's. Despite the conclusion of most electronic manufacturers and engineers that commercial color television was years in the future, CBS sought to marshal public opinion behind the notion of "color now." In doing so, it may only have confused prospective set buyers. RCA, in order to protect its own extensive investment in color research, was forced into a public demonstration of its admittedly outmoded (1941) system. By showing its system, although RCA protested that a good electronic color system—as contrasted to the mechanical CBS system—was at least five years away, RCA admitted that there was something to the CBS claims after all.

During the hearings, CBS had to bear the burden of proof not only against the public's growing investment in the VHF black-and-white system but against RCA's improved all-electronic compatible color system. Because the CBS system was not compatible, viewers with black-and-white sets would be unable to pick up color telecasts in monochrome. Another drawback was the large, noisy, and hard to synchronize and maintain mechanical color wheel used to filter, transmit, and reconstitute the primary colors in sequence, but CBS said that could be overcome by further engineering work. In spite of repeated public statements that RCA would sell its color

kinescope (picture playback) tubes to anybody, CBS never was able to purchase any in order to demonstrate that electronic rather than mechanical color reconstitution devices could be used at the receiver end.

RCA, in addition to publicizing the advantages of all-electronic compatible color, which it continued to perfect over the next several years, questioned CBS's motives in asking for immediate color standards. RCA representatives maintained that the industry, happily making black-and-white sets, should agree on new standards before the public heard about them. This was, of course, a complete reversal of RCA's position during the 1940 standards fight, when RCA tried to force through its own standards for commercial use in the face of violent opposition from the industry.

In hearings over its petition, the fringes of the industry supported CBS and the major established firms such as Dumont and Philco supported RCA. The FCC tended to depend on older elements of the industry in preference to CBS, with its limited experience in engineering and manufacturing. The same established companies also supplied most of the leadership for the RTPB and RMA committees, which the FCC continued to follow.

However, after long and acrimonious hearings and demonstrations, the commission approved the CBS color system in October 1950, over the entries of RCA and Color Television, Inc. Neither RCA, which appealed the FCC decision up to the Supreme Court and an 8-0 decision in 1951 upholding the commission, nor the rest of the manufacturing industry would accept this decision. John Crosby, columnist for the *New York Herald Tribune*, summed up the color decision in his October 24, 1950, column:

And God said, Let there be light: and there was light.

And God saw the light, that it was good: and God divided the light from the darkness.

And the FCC saw color and said, "Let there be color," and there was color. Or at least there was an edict decreeing color. And the public tried to divide the black and white from the color and discovered only confusion. Next to the FCC's, God's problem was comparatively simple.

Few CBS-standard color sets ever were made, although the company purchased some manufacturing facilities to make its challenge of RCA credible. While manufacturers were balking at the idea of constructing noncompatible, clumsy small-screen television sets and paying CBS a royalty for the privilege, RCA worked hastily to improve its own system. CBS recognized that its meager support would soon evaporate, since the new compatible RCA system would not disrupt existing television broadcasting, stop the profitable manufacture of black-and-white sets, cause public resentment over sets that would become obsolete overnight—even though CBS proposed that monochrome television on the VHF band be continued, for a while, at least—or cost the manufacturing industry additional royalties. Accordingly, the decision by the National Production Administration (NPA) in October 1951 that color television was “nonessential” to the stepped-up Korean War effort had the effect of getting CBS off the hook. The FCC also learned that it was unable to exercise practical control over the manufacturing industry and force the innovation of something the industry did not want.

Although the FCC rescinded its 1950 order approving the CBS system and in December 1953 approved RCA color—

in the slightly improved and modified version recommended by the National Television System Committee—manufacturers showed almost as little inclination to go ahead with RCA as with CBS color. The industry had no reason to consider color until the vast market for monochrome sets became saturated, and the cost was too high—\$1,000 and up per set—and there were too few color programs for the public to buy many of the complicated RCA sets.

The war between CBS and RCA really had ended with the NPA decision to halt production of CBS color-standard sets. After some bitter words between RCA's Sarnoff and CBS's Stanton, even CBS joined the NTSC effort to perfect a compatible color system. Although CBS had not been able to innovate its color system, in a sense it had won the war. Not only had the NPA order saved it from incurring serious loss, but it had gained the time needed to compete with RCA in the television broadcasting field. RCA inherited the mantle of possessing the color system but, as we shall see later, could not persuade the broadcasting and manufacturing industries to accept color fully for more than a decade. As a footnote to the CBS system's demise, it should be noted that specialized medical closed-circuit television units used the slightly better color rendition of the CBS system for many years and that color pictures transmitted from the moon in the early 1970s came from CBS-type cameras—built by RCA! There were a number of self-satisfied smiles around CBS when the moon pictures came through.

7•822 Interference Reduction Since the most obvious cure for tropospheric interference is increased mileage between stations on the same channel, this problem

could be and was solved within a few months, although the specific solution was not promulgated until the Freeze ended in 1952. Technical developments, such as *offset carrier*, by making it easier to tune stations also would alleviate the problem without affecting home reception. Instead of the 150-mile or less separations it had approved in 1945–1947, the commission toyed in 1949 with extremely rigid standards of 220-mile VHF co-channel separations. In its 1952 *Sixth Report and Order*, the FCC actually imposed 190-mile co-channel separations over most of the country. In the Gulf states, where propagation characteristics were different, the new standard was 220 miles. In the crowded Northeast, the FCC had to compromise, with a 170-mile standard. No station had to leave the air, but several were moved about on the VHF band in order to eliminate the worst examples of interference, such as in the Detroit-Cleveland area (see 7.81).

The commission held firmly to these new standards after they were established. Having once been burned, it was unwilling to reduce safety margins again, even though many of its prediction formulas came under attack as being inconsistent with measured characteristics of signals. To provide a third channel for Pittsburgh, it created a complicated new rule allowing a shift in assigned channel to a community within 15 miles of a listed major community rather than supporting a co-channel situation short-spaced by little more than a half-mile.

Most observers applauded the greater separations, particularly the 108 "pre-Freeze" stations, which would face less competition from new licensees. However, parties that wished to obtain VHF channels after the Freeze objected, claiming that a bit of interference was a small price to pay for healthy competition

and multiple program sources, since increases in separation would mean fewer local stations.

7•823 *Obtaining Additional Channels* To provide for a competitive nationwide television system, the commission had to find more channels for television. Increasing co-channel mileage separations reduced the number of stations possible on the 12 remaining VHF channels and made the problem worse. However, even those in favor of greater access were not in favor of starting in the untried UHF band, with its concomitant problem of receiver conversion. Accordingly, the FCC made unsuccessful attempts for a number of years to obtain additional VHF channels from the military and the FM band. Although for a while in the mid-1950s FM, then in the doldrums, had to fight hard to retain the 88–108 MHz band (see 8.21), the FCC was unable to overcome the political support FM enjoyed as a legacy from Armstrong's efforts. The military flatly refused to turn over a substantial part of its spectrum to television, even after several requests and studies. The Department of Defense argued that the "national security" required the reservation of these frequencies, even if they were not in full use.

The "outs" made some proposals that would have shoehorned in additional stations through less than maximum power, directional antennae, and reduced mileage separations. The FCC, with the growing administrative problem of allocation of the AM band as a warning, and also with a tender regard for the established service areas of the pre-Freeze stations, turned down these proposals.

Of necessity, the question became not *whether* to utilize the UHF band (470–890 MHz) set aside in 1945 for television experimentation and future broadcasting

but, rather, *how much* of it to use. Proposals ranged from a half-dozen channels up to the maximum possible, 70. To counteract the advantages enjoyed by the established pre-Freeze stations, it was suggested that *all* television be moved to the UHF band. The commission rejected this proposal, because of the already huge investment in VHF transmitters and receivers and because the propagational characteristics of the UHF band were such that some persons in rural areas would lose reception if the bands were changed.

The commission decided to allocate the entire 70 UHF channels to television but then restricted the upper end (channels 70–83) to low-power translators and other devices that provide television service inexpensively to smaller communities, and eventually turned it over to other services (see 9.22). Of extreme importance, the commission made no move to transfer all television from the VHF to the UHF bands, in spite of vague proposals to the effect that it had made in the mid-1940s (see 6.82).

One interesting experiment, with some implications for later proposed use of space satellites for direct broadcasting, was *Stratovision*. This system, originally proposed by Westinghouse and the Martin aircraft company, consisted of a standard television transmitter built into a transport airplane, which circled at 30,000 feet while sending out television signals. Tests conducted in 1946 and afterward (see 7.42) showed that transmission of this kind could achieve reliable coverage over a circle of from 50 to 200 miles in diameter. Once, the aircraft was used to link up the eastern and midwestern isolated segments of AT&T's coaxial cable network so that the Midwest could enjoy the World Series. Stratovision saved money over the equivalent ground transmitters, but it interfered with assignments of frequencies to ground-based sta-

tions and did not accommodate differences in population density. Analogous to AM clear-channel stations and eliminating much of the need for both coaxial cables or microwave linking stations and the many small stations otherwise needed to cover the nation, Stratovision must have seemed attractive to the FCC. However, the same small station operators and members of Congress who earlier had managed to restrict clear-channel AM stations to 50,000 watts objected on the grounds that Stratovision might be monopolistic. The commission dropped the idea when it found that some 20 channels would be needed to supply the entire nation with four signals and that the necessary perturbations of the aircraft would disastrously affect the principles of "fair, efficient and equitable distribution of television facilities to the various communities." Westinghouse donated the equipment to a university, and the principle was ignored until Midwest Program on Airborne Television Instruction (MPATI) started flying in the 1960s using nonbroadcast channels (see 9.4), and proposals for direct-to-home space satellite broadcasting became more frequent in the 1970s (see 9.1).

7•824 City-by-City Assignments Despite the pleas of potential broadcasters hoping for equality of access to a given community and of ABC and Dumont, the FCC finally assigned channels to communities by a system of priorities. These priorities ignored population density, the key to successful advertiser-supported station operation, and adopted a strict interpretation of Section 307(b) of the Communications Act, which calls for a fair geographic apportionment of channels to the several states and to the United States as a whole. Multiple services or program-

ming choices for the public were only a secondary priority.

The published priorities were to provide (1) at least one television service to all parts of the United States; (2) at least one outlet for local expression (station) to each community; (3) a choice of at least two services to all areas; (4) at least two program outlets or stations to each community. Assignments of channels which remained unassigned would follow the same pattern. Educational reservations (see 7.825) would be assigned to major educational centers, and to larger cities in a proportion of one educational for every four commercial assignments. Above all, the boat would not be rocked if possible: no existing station would be moved from a VHF to a UHF channel, or even from a lower (channels 2–6) to a higher (channels 7–13) VHF channel. However, under the FCC plan, almost all cities would be intermixed with both UHF and VHF channels assigned in the same community.

Channels would be assigned through an *assignment table**—a technique devised by the commission in the mid-1940s for both television and FM. Without such a table, an applicant for a station in an eastern state would be in competition with all applicants east of the Mississippi. The FCC had successfully defended this technique in court and further strengthened it in the preliminary (1951) and final (1952) reports ending the Freeze, by holding that applicants for a channel not specified in the table would have to secure an

*Although the FCC originally referred to a television "allocation table" when distributing channels city-by-city, it really meant "assignment table," the term that has appeared in recent documents. This chapter will use the term *assignment* for the earmarking of a channel for a given community or user, and the term *allocation* for the setting apart of a group of channels for a given service, such as television, or citizens band. (See Appendix B.)

amendment through lengthy and costly rulemaking proceedings—a major deterrent to making such changes. The only flexibility was to permit unlisted cities to apply for UHF “flexibility” channels and, as mentioned earlier, to allow an applicant in an unlisted town within 15 miles of a listed city to apply for assignment of a channel that met the mileage separation rules for the town in order to serve the city. Los Angeles joined New York in having seven VHF channels and several UHF channels assigned, largely because most of the VHF channels were already on the air. No other cities had as many VHF channels assigned.

The maneuvering among applicants for real or imaginary advantages of channel assignment or speed of obtaining a license could fill another book. City fought city, existing station fought applicant, and applicant fought applicant—but all parties grew weary and accepted most commission decisions, even Dumont, which had proposed its own nationwide assignment scheme based on different separation standards. The adopted assignment table, as amended in some cases, still determines local availability of channels.

7•825 ETV Reservations Educators hailed a suballocation within both the UHF and VHF bands to noncommercial educational television broadcasting, but it further restricted the number of channels assigned for commercial use in a given community. Reservation of educational channels in the assignment table was an advance over the practices on the AM band, where some 200 stations licensed to educational institutions in the 1920s had shrunk to a bare two dozen in the 1950s (see 3.4, 4.4, 5.4). However, it did not go as far as the FM separate educational allocation (see 5.4) of 20 specifically inviolate

channels contiguous to the commercial FM band, which any FM set could receive.

The ETV suballocation, or rather assignment, criterion was promoted almost singlehandedly by Commissioner Frieda Hennock who, with the aid of various educational organizations (see 7.42), persuaded the commission to adopt a reservation principle for educational television. Educators gradually realized that this might be their only chance to obtain broadcast channels and soon became an effective lobby. First enunciated in 1951, the criteria for establishing a reservation were explained in the FCC’s *Sixth Report and Order* of April 1952 (see 7.83): When more than three VHF channels were assigned to a city, one would be for education. Forty-six educational centers also would receive a reservation, 23 of them the only VHF channel in the community. A UHF channel would be reserved where a given market, not an educational center, had fewer than three VHF assignments or where all VHF channels already were in use. Unlike FM, the reservations could be for any of the 82 television channels.

Opposition to these reservations was strong but unsuccessful. It came chiefly from Dumont and others who were fearful of establishing channel scarcity in major markets. Other objectors included the NAB, which suggested—much as in 1934 (see 5.4)—that “voluntary cooperation” between broadcasters and educators would be satisfactory to both, and Senator Edwin Johnson (D-Colorado), who had led a congressional fight for the approval of CBS color and a speedy end to the Freeze, and whose desires for competitive broadcasting led him to suggest that commercial licensees be required to give a certain amount of time each day to educators. The commission rejected the latter proposal on legal grounds, as well as proposals by ed-

ucational institutions to make ETV stations partly commercial so that they would be self-sustaining.

In a final move, possibly inspired by President Truman's emphatic support of ETV, the FCC refused to place a definite time limit on using the educational reservations, although procedures for protesting them or changing them to commercial channels were to have been established after a year. Slow-moving educational institutions still had an opportunity to obtain a television license two decades later. By 1977, more than 250 ETV—or, as they have since come to be called, *public television*—stations were on the air, more than one-quarter of the television stations in the United States. Their existence allows commercial stations to ignore to some extent the discriminating ETV audience and also helps restrict potential commercial broadcasters from some markets.

7•83 *The Sixth Report and Order: Seeds of Future Problems*

On April 14, 1952, more than 42 months after the start of the Freeze, the decisions described above were made public and formal as the FCC issued its *Sixth Report and Order*. That it took the commission six "Reports and Orders" to reach final decisions suggests the complexity of the issues. The FCC had to deliberate in the face of strong urging by manufacturers, smaller networks, new station applicants, and the public in unserved or underserved communities to lift the Freeze at the earliest possible moment. Having incorporated virtually all its television problems into one omnibus hearing docket, the FCC was not inclined to loosen the leash on new television stations until it had made decisions on *all* problems. Thus,

we have the spectacle of selection of a color television system holding up consideration of UHF use, technical standards, allocation, and assignment. The group seriously interested in retaining the Freeze for its own sake, the pre-Freeze broadcasters, did not have to come into the open. As a matter of fact, their heterogeneity was such as to make unanimity impossible, since each of the 15 network owned-and-operated stations would favor the objectives of its parent network, to gain more affiliates and increase its nationwide salable "circulation." Much of the delay was due to people like Senator Johnson, who insisted that the color issue be decided before the allocation phase could come to a hearing. Such political pressure counterbalanced the efforts of manufacturers and organized labor to lift the Freeze and provide more television-related jobs, and the importunings of communities with limited or no television. When the FCC refused to lift the Freeze for such relatively unserved areas as Hawaii and Alaska, Senator Johnson grew nervous over the growing public pressure and assured his constituents that they would have television in time for the 1952 World Series. They did.

As with any FCC decision of this magnitude, the *Sixth Report and Order* included compromises that were to plague the industry, the public, and the commission in later years. Two of the most important were intermixture and the methods for serving smaller communities.

Under the *Sixth Report and Order*, cities would be intermixed with both VHF and UHF channels. Opponents of this scheme pointed out the grave disparity between the service the two bands could offer, and the economic disadvantage for a UHF station in a city with VHF stations assigned. If the VHF station had been operating during the Freeze, and the public had been saturated with VHF-only receiv-

ers, the problem would be compounded. Dumont's rejected plan provided at least some equality of outlets for the four networks in a majority of larger communities able to support television. Other organizations urged upon the FCC their own assignment plans, some of which tried to avoid intermixture. Even the report of the President's Communications Policy Board, issued a year before the *Sixth Report and Order*, clearly foresaw drawbacks to intermixture:

The proposed plan of the FCC contemplates the allocation of both VHF and UHF stations to the same community. There is little possibility that a UHF station can compete successfully with a VHF station. Within practical limits of power, a UHF station cannot serve as large an area as can a VHF station. For a considerable period after the UHF stations commence operation, particularly in cities where there are VHF stations, there will probably be few UHF receivers and consequently a limited audience.

. . . and also consequently a limited amount of advertising agency interest in buying time on the station.

However, because of theoretical propagation characteristics and equipment availability, the commission decided to support the fiction of equivalence of VHF and UHF. As a result, UHF stations in intermixed markets had ever increasing financial problems, forcing hundreds off the air (see 8.81). In the mid-1960s the commission and Congress belatedly took remedial action, after more than a decade of agonizing and conducting hearings (see 9.22).

Although the FCC understood the political power of rural and small-town areas of the nation in Congress, the *Sixth Report and Order* did not serve those areas adequately. It was recognized that small towns rarely could generate advertiser

revenues high enough to support a full-fledged station and that propagation characteristics of both VHF and UHF were such that many areas of the country could not be served by a television equivalent to a clear-channel radio station. But the FCC did not do anything substantive to supply the desired service.

However, even before the Freeze was well underway, people in some underserved communities had taken matters into their own hands. The first community antenna, now cable, television (CATV) in the United States was developed in 1949. In numerous isolated mountainous regions, particularly in Pennsylvania and Oregon, cooperating citizens or businesses established for the purpose placed antennas on neighboring peaks and strung wires from the antennas to homes in the valleys. In other isolated communities, clever electronics experts rigged the receiving antenna to receive the distant station and fed the signal into a homemade *repeater* or *booster* transmitter of low power in the valley. Such boosters gave good service to the valley community but, since all transmitters can cause interference farther than they can give service, caused widespread interference to the "parent" station.

At first, the FCC ignored cable and tried to close down the boosters—but they were too hard to track down and too easy to establish again virtually overnight, and had too much political support. Governor—former Senator—Edwin Johnson of Colorado appointed booster operators to his personal communications staff and successfully defied the FCC to act against them. The FCC attempted to provide alternatives—*satellite* stations with no original programming, and *translators* to move the received signal high into the little-used UHF channels—but failed (see 8.81). Although cable is now in some big cities as well as small towns, it primarily car-

ries television service of higher than off-the-air quality to small geographical areas with poor reception. All that has changed is the commission's regulatory stance toward it, and the belief of many people in its future (see 9.83).

Although the *Sixth Report and Order* was the result of much thought, work, and argument, its intended effect has not been realized. Because of its imperfections—and the imperfections of other policy statements by the commission and other government agencies—the number of television signals available today in a given community is far below the expectations engendered by the allocation and assignment plans. Television's growth in the United States has been phenomenal, but it has not been smooth. The inertia of political and economic force has aborted many possible organizational patterns for the medium. The shortage of television broadcast stations or, perhaps, cable outlets today restricts the viewing fare of the average citizen, sharply reduces the potential number of nationwide program sources (networks), and creates conditions of monopoly or near-monopoly in many communities, raises costs beyond the reach of the local advertiser, and restricts opportunity for new talent. At the same time, there is a critical shortage of space in the radio spectrum for services other than television.

7•84 *Public Service Responsibility*

On March 7, 1946, the FCC issued what may be its single most important programming policy document. Entitled *Public Service Responsibility of Broadcast Licensees* but bearing a bright blue paper cover that gave it its popular title, the "Blue Book" contained five major parts. First, it gave examples of station promises on programming—providing local live public

service programs, limiting advertising—versus their performance—inexpensive recorded music and a heavy proportion of ads. The second section provided the legal rationale for the FCC to act in the area of programming, chiefly in the process of choosing between competing applicants. Part three outlined what the FCC thought of as public service factors. These included the need for sustaining programs to (1) provide a balance to advertiser-supported material, (2) offer programs whose nature would make them unsponsorable, (3) serve minority tastes and interests, (4) cater to the needs of nonprofit organizations, and (5) allow experimentation with new types of programs. Charts and tables were used to show that networks usually aired sustaining programs at hours when few could listen, reserving the prime hours for advertiser-supported programming. The commission noted that when networks did provide public service material, most of their affiliated stations rejected it for a locally sponsored show. The third part of the "Blue Book" also outlined local station practices in programming and advertising that made it difficult to hear discussion of public issues on the air. Part four provided tabular statistical data to show how broadcast profits had increased from 1937 to 1944, which presumably would have allowed broadcasters to pay for some of the suggested improvements. The last part of the "Blue Book" was a summary that reiterated the importance of the station licensee in policing his own product. The FCC would favor renewal applications from stations that had met their public service responsibilities, defined as: sustaining programs, local live shows, discussion of public issues, and no excessive advertising. The "Blue Book" conclusions were described as neither regulations nor proposals for new rules but rather as a codification of FCC thinking to help licensees

and regulators alike. Yet, this *was* the first major report on FCC consideration of broadcast programming policy, although the commission previously had acted against specific stations on specific matters.

Initial reaction of the broadcasting industry to the “Blue Book” was calm but predictable; it claimed that the government was violating radio’s freedom of speech since the Communications Act forbid the FCC to censor. A month later the issue heated up with the publication of *Radio’s Second Chance* (1946) by Charles A. Siepmann, who was thought to be chief writer of the “Blue Book.” Actually, although Siepmann—a former British broadcaster accustomed to the public service philosophy of the BBC—had been a consultant on the “Blue Book” project for a short while, FCC economist Dallas Smythe and others had put most of the report together. In *Radio’s Second Chance* Siepmann criticized American broadcasting and brought down on the FCC, and himself, the wrath of an industry fearing that the commission was planning specific programming rules and regulations. Newspapers were divided over the FCC report, some defending it and others fearing a government takeover of radio. The trade press—particularly the business weekly, *Broadcasting*—attacked it mercilessly, although no station was ever taken to hearing or off the air for not meeting “Blue Book” standards. Baltimore station WBAL, held up as a bad example in the “Blue Book,” won its license renewal over a competing application from columnist Drew Pearson.

Still, the report had some solid results over time: the NAB strengthened its self-regulatory radio code, broadcasters had a clearer notion of what the FCC was looking for in comparative license renewal and application hearings, the FCC showed that it had the backbone for once to speak

out if not act in a controversial area, and the “Blue Book” still provides the commission with a useful precedent and the industry with a rallying point.

A specific area of public service received special attention in 1948–1949, when the FCC reversed itself over the right of stations to editorialize on the air. In 1941, while passing on a competing challenge to Boston radio station WAAB’s license renewal, the FCC decided that “the broadcaster cannot be an advocate” or, in other words, that a licensee should not use the airwaves he controls to propagate his own opinions. A few broadcasters, and others claiming that it would limit the free speech rights of broadcasters, attacked this “Mayflower Decision,” named after the competing applicant, the Mayflower Broadcasting Corporation. But, although a few stations ignored the rule, no licensee challenged the FCC in court. Most broadcasters did not editorialize anyway, and disliked antagonizing sponsors and segments of the audience by taking sides on any question. Some broadcasters avoided any mention of labor unions on the air because the topic was “controversial.”

After hearings in which the NAB took a leading role, the FCC issued a report in 1949, *In the Matter of Editorializing by Broadcast Licensees*, which “clarified” the 1941 decision. It stated that “Only insofar as it is exercised in conformity with the paramount right of the public to hear a reasonably balanced presentation of all responsible viewpoints on particular issues can such editorialization be considered to be consistent with the licensee’s duty to operate in the public interest.” That decision generally was hailed as allowing broadcasters more of the rights enjoyed by print media under the First Amendment. The way was opened for editorializing, which started slowly in the 1950s. Even more important, the precedent was set for

what was later called the Fairness Doctrine (see 9.82).

An important case in this area opened in February 1948, when the Radio News Club of Southern California formally charged that G.A. Richards, president and controlling stockholder of stations KMPC in Los Angeles, WJR in Detroit, and WGAR in Cleveland, had ordered his news employees to slant the news—against President Roosevelt and his family in particular. Voluminous hearings began in 1950, but Richards' death in May 1951 rendered the matter moot in the opinion of the FCC Hearing Examiner. After Richards' heirs "rejected" the earlier practices, the commission closed the case without penalty, and the stations were soon sold.

7•85 *The Petrillo Affair*
(continued)

To add to broadcasting's economic complications in the postwar years, the American Federation of Musicians was still making demands (see 6.83). In October 1945 it ordered networks to hire duplicate orchestras or forgo use of network programs on FM. A month later it gave local stations the same order, helping speed the end of studio orchestras at all but the largest stations, as most turned to recorded music completely. Congress reacted to the AFM pressure by passing the Lea Act (after Congressman Clarence F. Lea, D-California, its sponsor) in April 1946, which made it unlawful to force a broadcast licensee to, among other things, hire unneeded personnel, pay salaries in lieu of those unneeded personnel, pay more than once for a single service, or pay for services which were not performed. After a series of court appeals, the Supreme Court of the United States upheld the act in June 1947. Further weakening the power of unions was the

passage six months later of the Taft-Hartley Labor Relations Act. Faced with these restraints, AFM President Petrillo agreed in 1948 to a two-month trial of using one orchestra for AM-FM programming—and then caved in on the issue for good. In the meantime, radio stations had begun to rely more on recorded music and disc jockey programming, further weakening the ties between broadcasting and live music.

7•86 *Self-Regulation and Blacklisting*

The roles of trade and professional groups in broadcasting reflected the confusion of the period. There seemed to be a trade group for every kind of station—FM, television, would-be educational stations, new stations, old stations, and, of course, the National Association of Broadcasters. NAB, essentially a conservative association of members of the broadcast station establishment, working hand-in-glove with Sol Taishoff, the publisher-editor of *Broadcasting* magazine, had to re-evaluate its functions with the coming of television. In 1951, to eliminate the rival Television Broadcasters Association, it changed its name—for seven years anyway—to the more cumbersome National Association of Radio and Television Broadcasters. (*Broadcasting* became *Broadcasting • Telecasting* at around the same time.) NAB's temporary shift in title helped pacify new television license holders who felt the organization was overly beholden to old-line AM radio operators. All groups spent as much time bickering with one another about roles and priorities as they did educating the public and politicians to their point(s) of view.

The NAB directed its major attention toward what it saw as government encroachment on programming decision-

making. As a result of the “Blue Book,” oft-repeated threats of specific legislation, and public pressure to improve radio and television program standards, the NAB completely revised the 1939 radio code. “Standards of Practice,” issued in 1948, was more stringent on limitations on advertising time. Although many stations adhered to them, they were still unenforceable. As more stations went on the air, especially in sparsely populated rural areas or urban regions with great competition, the struggle for economic survival often prevented adherence to the NAB code standards. “Standards of Practice” and the motion picture code served as models when the NARTB issued its first Television Code early in 1952, basically an unoriginal, proscriptive recitation of things the licensees should *not* do. The single means of enforcement was not much of a threat: NAB’s right to prevent the station’s display of the Television Code Seal on the air and in advertising.

The period of the communist scare and blacklisting—in which the industry, through fear and cowardice, let others control it—was a grim era in broadcasting and film and the arts generally. Blacklisting was the process of secretly refusing to employ someone, usually in this case a creative talent—actor, writer, producer, director—solely because of a frequently unsupported claim that he or she was a communist, had communist, “fellow traveler,” or ultraliberal left-wing inclinations, or had been duped by communists. The vicious thing about blacklisting is suggested by its name. It was done by small groups of self-appointed investigators who made surreptitious reports to advertisers, agencies, stations, and networks indicating that someone either should not be hired because of his or her political beliefs or was “cleared” for employment. Potential employers who did not pay attention to these

messages could expect to have their own patriotism impugned. Potential employees not cleared were seldom told why, and no executive ever admitted the existence of the blacklists. Blacklisting worked, from about 1948 until the early 1950s, because its organizers hit the broadcast system at its weakest point: the advertiser. Under threats of product boycotts, advertisers pressured agencies and broadcasters not to hire someone for fear of losing sales, or at least creating controversy, which all advertisers shun. With advertisers representing the broadcasting industry’s source of income, no one in broadcasting would speak out against the practice or even admit it existed—only persons who had been blacklisted themselves, and they were no longer in broadcasting.

Perhaps the most successful and ironically, considering its secretive nature, the most visible blacklisting group was American Business Consultants, based in New York. Consisting of three former FBI agents, it issued a newsletter called *Counterattack* and often published special monographs. On June 22, 1950, it issued *Red Channels: The Report of Communist Influence in Radio and Television*, some 200 pages of detailed background information on 151 broadcast personalities, whom it suggested were at least sympathetic to communist thinking. *Red Channels*, carefully avoiding outright accusations, reprinted reports from the House Un-American Activities Committee and other official and unofficial groups, using the umbrella of official sources—mixed with some “guilt by association” and innuendo—to brand persons as undesirable. An accident of timing made *Red Channels* particularly effective: three days after it was published, North Korea invaded South Korea and the United States entered the Korean War or “police action.” Other than this one report, which was widely distributed, black-

The Big Red Scare: 1950

If the Communist Party USA exacts a heavy financial toll of its members and dupes, it has been no less energetic in seeing to it that they get ahead in show business, while articulate anti-Communists are blacklisted and smeared with that venomous intensity which is characteristic of Red Fascists alone. . . . Those who are "right" are "boosted" from one job to another, from humble beginnings in Communist-dominated night clubs or on small programs which have been "colonized" to more important programs and finally to stardom. Literally scores of our most prominent producers, directors, writers, actors and musicians owe their present success largely to the Party "boost" system, a system which involves not only "reliable" producers and directors, but also ad agency executives, network and station executives, writers, fellow-actors and critics and reviewers. In turn, the Party member or "reliable" who has "arrived" gives the "boost" to others who, the Red grapevine whispers, are to be helped. . . . Contrary-wise, those who know radio and TV can recite dozens of examples of anti-Communists who, for mysterious reasons, are *persona non grata* on numerous programs, and who are slandered unmercifully in certain "progressive" circles.

The purpose of this compilation is three-fold. One, to show how the Communists have been able to carry out their plan of infiltration of the radio and television industry. Two, to indicate the extent to which

many prominent actors and artists have been inveigled to lend their names, according to . . . public records, to organizations espousing Communist causes. This, regardless of whether they actually believe in, sympathize with, or even recognize the cause advanced. Three, to discourage actors and artists from naively lending their names to Communist organizations or causes in the future.

Excerpts from *Red Channels: The Report of Communist Influence in Radio and Television* (New York: Counterattack, 1950), pages 4–5, 9.

It is quite clear that whereas the editors and publishers of *Red Channels* and *Counterattack* do not consciously strive for the same objectives as the agents of Communism, their methods and techniques are very similar and so are their standards of morality and their respect for the essential "Blessings of Liberty" guaranteed by the Constitution and the Bill of Rights. As the vigorously anti-Communist *Saturday Review of Literature* has said, "*Red Channels* accepts Red Doctrine: to accuse is enough." It would be difficult to imagine any doctrine more profoundly un-American.

Playwright Robert E. Sherwood's reaction as he introduced an American Civil Liberties Union report on the subject, Merle Miller's *The Judges and the Judged* (New York: Doubleday, 1952), page 9.

listing remained institutionalized behind closed doors. Advertising and package agencies and networks soon assigned a “security checker” to make certain that anyone hired was “clean” with the blacklists. Some stations and networks even required new employees to take a loyalty oath. Actors and writers who “confessed” their associations and informed on their colleagues before the House Un-American Activities Committee or prominent unofficial groups usually could be expunged from the blacklist. The insidious process continued until a celebrated case (see 8.85) helped break the system.

7•9 The Impact of Television

That radio and television listeners and viewers were becoming more concerned about broadcasting’s role in their daily lives was demonstrated by the rising clamor of complaints that helped lead to the 1948 revision of the NAB code, and in group action. In the late 1940s radio listener councils that sought programming of more value to the local community reached a peak. These councils were active in New England, the Midwest, often sparked by university activists, and California. They issued lists of good programs, conducted audience surveys, held informational meetings, produced special programs in cooperation with some stations, and generally encouraged greater educational use of radio. Although in Europe such groups often met for communal listening to special programs, that pattern did not develop here. Some councils organized around program production, frequently in association with a university, while others merely studied the industry and its problems and then pressured or at least advised local station managers to improve their programming. None of these groups

covered a wide enough area or lasted long enough to have a lasting impact on the industry.

Many critics and professional broadcasters became increasingly concerned that radio was changing from a varied format, with something for everyone, to a stereotyped format of popular music and news with high advertising saturation. The increase in radio stations and expansion of television put such a financial strain on most radio broadcasters that they could not afford to accommodate many community requests for change.

7•91 *Television’s Domestic Effect*

Of concern to all other mass communication media, as well as operators of any means of recreation or entertainment, was the impact of television. Two media that felt the immediate brunt were radically changed—radio and the movies. We have already discussed radio’s loss of drama, variety, other entertainment—and advertisers—to television, and radio networks dried up to little more than news services with some sustaining entertainment programming (see 7.61). As radio in the 1950s became more a local advertising medium, concentrating on recorded music, television became the evening-in-the-home entertainer and national advertising medium.

Hollywood, however, seemed in some ways totally unprepared. This was understandable, since the movie industry was fighting two important battles not directly connected with television. It lost the battle with the federal government over the right of large production studios to own chains of theaters. When the Paramount studio was forced in 1948, after a decade of antitrust litigation, to divest itself of its theater chain, panic set in. All

major studios had to sell their theaters, keeping the production studios and distributing organizations, and with the sale went the benefits of vertical integration and a guaranteed market for the hundreds of feature films made each year. The motion picture industry also encountered blacklisting, although here it often surfaced in public, during emotional congressional and other hearings where actors and other movie people fell over one another in informing—with or without evidence—on old friends and enemies. Some of the accused took the Fifth Amendment, or refused to testify—at the cost of a jail term in a number of cases. The scars are still evident.

After 1950, television provided another punch to an industry no longer secure in its role or its profits. As early as 1949 motion picture attendance was off by 20 percent and employment was down by 25 percent, with lower-ranking workers, and not the top-heavy management, being laid off. As fewer films were made, more people were out of work. The former film audience was staying home, or going for a ride now that wartime transportation shortages had ended, and the movie audience soon dwindled from a family affair to an opportunity for teenagers to date. After 1950 the abandoned motion picture theater became a common sight. Hollywood unfairly blamed everything on television and tried to boycott the video medium. Stars under contract were not allowed to appear on television, old films were not released to networks or stations for television showing, and television workers were shunned in the movie colony. It was an ostrich act, which had to change radically when the American feature film industry faced even greater problems in later years.

Professional sports promoters also worried about the effects of television on

game attendance. Televised sports events often had the direct result, according to team management's perceptions of the data, of reducing the gate receipts. Team owners were caught between the lure of substantial income from selling rights to a game to a network or station and the sight of empty seats and reduced parking and concession income as the fans stayed home to watch in comfort. Research sponsored by a number of professional teams showed that television had little effect on attendance over a season. Still, local game *blackouts* date from those early years, with many variations depending on the personal opinions of team owners. Only in 1973 did Congress impose restrictions on the blacking out of sold-out games in pro football (see 9.63).

Television affected other institutions as well. Advertisers began to shift vast sums of money into television that had once gone to radio or the print media. Likewise, television was radically changing the process and appearance of national elections and between-campaign politics (see 7.64). There were rumors and reports of changes in family life-styles, sleeping habits, children's entertainment and activity preferences—it was a lot more fun and easier to watch the *Lone Ranger* than to go outside and play cowboys and Indians—eyesight problems, juvenile delinquency. However, many of these developments were merely hinted at during the late 1940s and early 1950s; television's impact on children would not be readily observed in the United States until later (see 8.73 and 9.72).

7•92 *Postwar Broadcasting Abroad*

While television preoccupied most of this country right after World War II, radio remained the preeminent broadcast

medium abroad. Even by late 1952, few countries outside the United States had television, and most of the transmitters and approximately 85 percent of the world's television sets were American—even though the country had only a little more than 5 percent of the world's population. The major foreign countries using television regularly were Canada, Cuba, Mexico, and Brazil in the Western Hemisphere and using U.S. technical standards, and France and Great Britain in Europe, each using different technical standards.

In the United Kingdom, the BBC resumed television transmissions in June 1946 by including in the opening program the same film cartoon that had been the last thing seen when BBC television left the air at the outbreak of the war in 1939. The French had conducted some experimentation and programming in Paris under German occupation during the war, and had continued transmissions after the war. But television in most other countries was limited to one or two transmitters and a few hundred or few thousand receivers—about where American television had been before the war.

With radio, a far more important and widespread medium, the main post-war job abroad was rebuilding and replacing transmitters, systems, and receivers. Since radio was easy to reconstruct and immediately useful once rebuilt, many countries put their mass communications effort in radio. German radio, under Allied occupation, was restructured along local and regional lines with no national radio organization whatever—in reaction to the Nazi centralized control of broadcasting and other media. In Japan the American occupation forces held strict control over radio at first, gradually easing it in the late 1940s to permit NHK to resume as the principal broadcasting organization. The

United States allowed some Japanese international broadcasting early in 1952, expanded it when Japan's utility as a base during the Korean War became apparent, and then ended the occupation.

International broadcasting after 1945 became a weapon in the cold war with the Soviet Union and its allies, which intensified after 1947. For the first time, the United States was active in such communication in "peacetime." The Voice of America had started with the wartime operations of the OWI (see 6.61) but had moved to the State Department. It operated in many languages and beamed news, music, and other programming to most areas of the world. In addition, the United States government set up three radio services in Europe. Radio Free Europe, which for years claimed to be privately supported when it was in fact supported clandestinely by the CIA, tailored its programming to the nations of Eastern Europe that the Soviets had occupied in 1945. Radio Liberty, also U.S. government-supported although declaring its private status, broadcast directly to the Soviet Union. Radio in the American Sector of Berlin (RIAS) was overtly run by the State Department, and was heard throughout East Germany. Much of the programming was music and "straight" news, with little direct propaganda, although the services varied—Radio Free Europe, for instance, at first held out hope of freedom to the European satellites of the Soviet Union and was largely programmed by refugees from the Communists—and *any* content, even if not directly controlled by the government, might be called propaganda. The Soviets spent huge sums building transmitters to send out noise to "jam" the incoming signals in urban areas. Penalties were imposed for listening to foreign broadcasts, although much "radio" broadcasting in the Soviet Union was wired or "rediffusion" much

like CATV, and thus the audience could not select programs. Other nations broadcast to the world on the international shortwave bands as well, particularly the BBC, which had been doing so since the 1930s, and the Soviet Union.

After much preliminary work a major International Telecommunications Union meeting was held in Atlantic City in 1947 to revise the international frequency allocation table. Few changes in American broadcasting were necessary, but it was desirable to allocate the frequencies that had been opened up by wartime research. This conference, like other ITU meetings, showed that international cooperation *could* be achieved in the telecommunications field.

7•93 *Period Overview*

As the length of this chapter attests, summarizing the important events and trends of 1945–1952 is not easy. Overall, the period contained the transition from the AM radio-only broadcast industry, which had been around since the early 1920s, to a system incorporating AM and FM radio and VHF and UHF television, with such services as CATV and pay-TV in the wings. The industry was far bigger and more complex in 1952 than in 1945. The radio establishment helped pave the way for the new television network establishment; indeed the ownership of the new medium came essentially from the groups that had controlled prewar radio. The organization and operation of early television is the overriding theme of this period.

This short space of time also saw the fortunes of educational broadcasting rise as reserved frequencies became available first in FM and then in television. These decisions paved the way for the spectacular expansion of educational, later “public,” broadcasting in the 1950–1977

period. But in the rush to television, some things were given short shrift. FM radio, the chief initial loser, entered a long period of decline after a short burst of postwar growth. Even television met problems as a result of the complicated FCC allocations proceedings during the Freeze. Although intended to correct earlier FCC mistakes, the 1952 *Sixth Report and Order* created UHF television stations as second-class citizens—a condition that soon would be abundantly clear.

Television expanded far more rapidly than radio simply because it built on the existing radio structure. Thus television used radio program formats with added video, networks were operated along radio lines, the role of advertisers was never in doubt, and radio set makers learned to make television sets. With its rapid growth and more complicated organization, the overall pattern of expanding television was the same as existing radio. Compared to radio’s initial impact on American society (see 3.91), television’s effects on motion pictures, sports, and leisure patterns were felt in less than half the time. The new medium quickly dominated America’s life-style.

The 1945–1952 period brought such radical changes that today’s broadcasting can almost be said to date from this era rather than from the pioneering of the 1920s. While FM radio and television suffered from growing pains, they benefited from the lessons of AM radio. The greatest growth of both new broadcast services, and the transformation of AM radio’s functions, were to come in the Eisenhower years—between 1952 and 1960.

Further Reading

There are several fine reviews of radio at its peak, up to 1948 or so: Landry’s history and description (1946), Llewellyn

White's highly critical overview of radio development and regulation (1947), Bryson's review of major problems facing radio (1948), Waller's textbook (1950) describing network and station operations, and Siepmann's text (1950) reviewing the role of broadcasting and society in a way timely today. Social history of this era, with broadcasting emphasis, is to be found in Barnouw (1968) and Lichty and Topping's reader (1975).

The FCC's *Network Broadcasting* (1958) offers one of the best overviews of

early regulatory and organizational development in network television. The commission's *Economic Study* (1947) details the pretelevision economic plight of the expanding number of AM stations. Midgley (1948) gives a cogent review of pre-TV station and network operations, Wolfe (1949) deals with the same material in greater depth, and Diamant (1971) describes early television commercials. The struggle for educational television is detailed in Powell (1962).

Programming for radio is best cov-

Key Broadcasting Indicators: 1950 / This is the fifth of ten tables offering comparable information over a 50-year period (to 1975), presented at five-year intervals. Sources for items 1–6 and 11 are the tables in Appendix C, while other information comes from sources indicated below. Most data are for January 1.

Indicators	AM	FM	TV
1. Number of commercial stations	2,061	733	98
2. Number of noncommercial stations	ca 25	48	—
3. Total stations on the air	2,086	781	98
4. Number of network-affiliated stations	1,170	na	96
5. Percentage of commercial stations affiliated with networks	56%	na	98%
6. Total industry revenue (add 000,000)	\$605.4	\$2.8	\$170.8
7. One-hour station rate (New York)	\$1,200	na	\$1,500
8. One-minute station rate (New York)	na	na	na
9. One-hour network rate, evening	\$20,400	na	\$17,425
10. Number of broadcasting employees	..... 52,000		14,000
11. Percentage of families with sets	94.7%	na	9%
12. Broadcasting regulatory budget (FCC)	.....	\$6,729,345	
13. Total FCC personnel	.....	1,285	

Notes (see Appendix D for full citations)

na = not applicable or not available.

2. The one educational TV station (WOI-TV in Ames, Iowa) was operating on a commercial channel as there was no educational allocation until 1952.
7. WEAf (NBC radio, New York) and WNBT (NBC television, New York).
9. NBC radio network (172 affiliates) and television network (50 affiliates).
10. Radio figure is for 1949, while TV figure is for 1952. Radio includes both AM and FM stations and networks. Lichty and Topping (1975), page 290, table 23.
11. The comparable FM figure would have been no more than 1 percent nationally, though it approached 10 percent in the bigger cities.
- 12–13. FCC figures for fiscal year 1950, ending June 30.

ered in the books noted under Chapter 5. The transition of CBS from radio to television is discussed in Metz (1975). Critical views of radio and television can be found in Crosby (1952) and Gross (1970). One of the better books by broadcasting figures is Allen (1954); for biographies of key broadcast journalists see Kendrick on Murrow (1969), and Kaltenborn (1950). The major audience surveys of the period are those of Lazarsfeld and Field (1946) and the lengthier follow-up by Lazarsfeld and Kendall (1948).

Regulatory events of this era are best described in the FCC *Annual Reports*, in Warner (1948, 1953), and in the FCC "Blue Book" (*Public Service Responsibility of Broadcast Licensees*, 1946). For blacklisting, see Counterattack's *Red Channels* (1950), Cogley (1956), and Vaughn (1972). A summary of broadcast industry views on amendments to the Communications Act can be found in the NAB's *Broadcasting and the Bill of Rights* (1947). The FCC's *Sixth Report and Order* was printed in official government format (41 FCC 148) and by both *Broadcasting and Television Digest*.

Most early books on television looked on the medium with awe, but the following titles are useful: Kempner (1948) and Abramson (1955) for the technical development of television, Dunlap (1947) for a forecast of the future of the medium while the networks were just being planned, and both Eddy (1945) and Hutchinson (1950), which show early production methods and station operations. Dupuy (1945) provides a very early handbook on production based on five years of programming at WRGB.

World communications are described in most detail in the Unesco series, *Press, Film, Radio* (1947–1951), which assayed media systems of nearly all countries in the world, beginning with the war-torn

countries of Europe, while the initial expansion of television is detailed in Unesco's *Television: A World Survey* (1953). See also early editions of Unesco's *World Communications* (1950, 1951).

The Age
of Television
(1952–1960)



"On the evening of March 7, 1955, one out of every two Americans was watching Mary Martin play Peter Pan before the television cameras. Never before in history had a single person been seen and heard by so many others at the same time. The vast size of the audience was a phenomenon in itself as fantastic as any fairy tale. The age of television had arrived."—Leo Bogart, The Age of Television, page 1





The Age
of Television
(1952–1960)



“. . . we are convinced that the UHF band will be fully utilized, and that UHF stations will eventually compete on a favorable basis with stations in the VHF.”—FCC Sixth Report and Order (1952), paragraph 197

“[potential UHF operators] had better study astronomy to figure up their balance sheets and buy lots of red ink.”—Commissioner Jones in dissent to the Sixth Report and Order

Radio seemed to fade into the wallpaper during the 1952–1960 period, and television came to the fore. This chapter takes us from the end of the FCC Freeze on television station construction in 1952 to the quiz show and payola scandals in 1959–1960, which caused a shakeup in the FCC and new public awareness of the business of broadcasting. For television the period opened with growth and excitement but ended with questions and recriminations.

The 1950s were the Eisenhower years—a time of conflicting images. After two decades of Democratic administrations, General Dwight D. Eisenhower won the 1952 Republican presidential nomination from the more conservative Ohio Senator Robert A. Taft and then won the elec-

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The Age of Television (1952–1960)

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tion from Adlai E. Stevenson (see 7.64). Since the Freeze had ended early in 1952 (see 7.83), plans for building hundreds of television stations were well advanced by the time “Ike” moved into the White House. Viewers absorbed the political turnover and subsequent shifts in international relations, particularly after the death of Stalin in March 1953. Wisconsin’s Senator Joseph McCarthy, riding high in his witch hunt for communists everywhere, had a rendezvous with television that ended his power in American political life. The Supreme Court issued its famous school desegregation decision, which led to political and social crises aired in detail on the nation’s television screens. In New York, the United Nations headquarters was completed with provision for television and radio coverage of important events.

The 1950s had many fads—the Davy Crockett craze, inspired by a television show; tail fins on Detroit cars; small kids writing the letter Z on everything in sight, just like the hero of the Walt Disney television series *The Mark of Zorro*; hula hoops; silly putty; rushing home from school to catch the five-minute episode of *Crusader Rabbit*; evangelists Billy Graham and Oral Roberts on television; the sack dress, which made a woman look like a chic sack of potatoes; rock ‘n’ roll music; telephone booth stuffing; swooning over pop singer Elvis Presley. The few fads that were not based on or inspired by television shows were at least reported widely by the medium.

People had more leisure time, and television quickly became the most popular way to spend it. Families had much larger incomes since the war had ended the Great Depression, while workers spent less time on the job. The work week very slowly shrank to less than 40 hours by 1960. Additional leisure came with increasing purchases of washing machines,

dishwashers, garbage disposals, dryers, and power mowers. As people spent many hours a day watching television, audiences dwindled for nearly every other kind of entertainment. The television audience grew faster than that for any other medium or means of recreation. By 1958 more homes had television than the 1939 number of radio homes; that is, though far more expensive, television achieved near-saturation in half the time it took radio.

Virtually all the developments in radio and television were predictable from occurrences of the revolutionary 1946–1952 period, since television built upon and expanded the industry established by radio. AM continued to grow and change, despite fears that it was doomed by television; interest in FM radio faded away until it began a slight upturn at the end of the decade; and television’s growth, problems, and promise filled the news of broadcasting. The 1952–1960 period was in nearly every way an age of television, more so than any time before or since.

8•1 Stereo and Videotape Technology

Two developments in broadcast technology in this period soon proved of immense value. The first was single-station stereophonic radio broadcasting, and the second was the perfecting of the videotape magnetic recording process for television.

8•11 Stereo and Multiplexing

The idea of stereo was not new. There had been lab experiments with stereophonic sound in the early 1900s, and in the 1920s stereo radio binaural broadcasts had been made from the stage of the Berlin Opera House, using six microphones in

three pairs, half of each pair fed to a separate AM transmitter. In this country, some AM stations, especially those that played classical music, experimented with two-station AM stereocasting, with one station broadcasting the right channel and the other the left. The difficulties were that listeners to only one of the stations got but half a signal, and offering the same program on two different wavelengths wasted spectrum space.

The same limitations were present in 1952 when the *New York Times*-owned WQXR tried AM-FM two-station stereocasts, using AM for the right sound channel and FM for the left. In 1954 Boston's WCRB began four hours a week of such programming, boosting it to 40 hours a week by 1959. These early broadcasts were nearly always of live music, as there were few sources of stereophonically recorded music even on tape. After 1958 commercially recorded stereo records became available and recorded music could be readily broadcast in stereo. Even the networks got into the act when NBC broadcast the *Bell Telephone Hour* stereophonically in 1958 over its four O & O AM and FM stations. CBS followed suit, and television also was used when ABC stereocast the Lawrence Welk program on television and AM. Other experiments or demonstrations intermixing AM, FM, and television channels brought out another problem: FM stations offered such better sound reproduction quality that, when one station was an AM, the two channels sounded very different. In addition, since the coverage area of these broadcasts obeyed the propagation laws of the frequency bands on which the two services operated, the AM half of the signal reached out much farther. The obvious notion of FM-FM two-station stereo was impracticable since few people had a single FM receiver, let alone two.

Faced with these technical limitations but responsive to audience interest in stereo broadcasts, broadcasters, particularly the hard-pressed FM operators, began to petition the FCC for commercial use of experimental single-station stereo broadcasting. Common technical standards would be needed so that all stations would broadcast the same sort of signal and all stereo receivers could pick up any stereo signal.

Meanwhile, some FM stations (see 8.21) had discovered a way of making money. While it made use of their transmitters, it was not broadcasting. In the late 1940s, stations in urban areas had developed *storecasting*—the sending of music directly into stores and offices over special receivers that, upon transmission of a special tone, automatically cut out talk, leaving only the background music. Income came from rental of these receivers to business establishments. Although recognizing the stations' need for income, the FCC ruled against such use of the broadcast signal in the early 1950s, claiming that these customers had a stronger say in selection of music to be broadcast than regular listeners, a contravention of the 1934 Communications Act.

The commission ruled in 1955 that FM stations, instead of shutting off the special receivers with a simple tone in a process called *simplexing*, could storecast only by *multiplexing*—a more complicated process whereby the station transmitter sent out two different but simultaneous signals, one to the stores, one to the general public. Although broadcasters objected to the expense that this would entail, the FCC stuck to its guns. But storecasting and single-station FM stereo came into conflict, because both processes required some form of multiplexing. In the mid-1950s, broadcasters did not know how to transmit more than one FM subcarrier

signal at a time. Yet, because storecasting was a ready money-maker, and stereo offered FM a way out of its downward slide in audience appeal, broadcasters wanted to be able to provide both services at once.

At the start, 17 technical systems were proposed for stereo broadcasting. Unfortunately, few of them allowed simultaneous storecasting. To try to sort out the conflicting systems, the industry resorted to an approach used earlier for television allocations and standards (see 6.81): it set up a committee of engineering experts from the industry to eliminate inferior systems by a series of comparative tests. In 1959–1960, this National Stereophonic Radio Committee (NSRC), working with FCC engineers, cut the number of competing systems to seven. Easily eliminated were those that did not allow storecasting and stereo at the same time, since by now some 250 stations were engaged in storecasting. While the tests dragged on, many stations kept using AM-FM two-station stereo.

Finally, in April 1961, the FCC set as the industry standard one that combined the Zenith and General Electric systems. Of the 15 other proposals, some had come from firms that merely wanted to promote stereo or FM, but most, of course, came from individuals or companies that wanted to exploit strong patent positions. As will be seen in the next chapter, this 1961 decision contributed to a new era of FM expansion through stereo while preserving storecasting and other Subsidiary Communications Authorizations (SCA) multiplexed services.

8•12 Videotape Recording

In the 1950s a magnetic tape recording process for television achieved broadcast quality. Since commercial television broadcasting took hold in 1948, pro-

gramming had been of three types: live, film, or kinescope recording (see 7.13), which was noticeably fuzzier and grainier than live or regular film. The search to replace the kinescope recording process had begun after the war, and a magnetic videotape system had been publicly demonstrated in 1951–1952. Late in 1953, shortly after FCC approval of color television standards (see 7.821), RCA demonstrated a videotape recording (VTR) system for both color and monochrome television. The system, like earlier ones, showed promise but had serious technical problems.

The unveiling of a practical VTR took place in April 1956 at the NAB convention in Chicago. Ampex, a small California-based firm which had worked on audio tape recorders for Bing Crosby in the early 1950s, demonstrated a working black-and-white VTR system. Within days, Ampex took in \$4.1 million in orders, even though these models, using a two-inch tape moving at 15 ips, cost about \$75,000 each. Now, finally, West Coast stations had a high-quality, practical means of delaying East Coast broadcasts without having to use film or kinescopes, or simply having New York repeat the show live. CBS apparently was the first broadcast organization to make this use of videotape recording, in November 1956.

In 1957 Ampex and RCA pooled their patents and knowledge so both could build compatible systems for color and black-and-white. Ampex, being first with a workable system, had sold more than 600 by early 1960, more than two-thirds of them to networks. After the introduction of the VTR, the networks rarely used the "kine." Because of the many network orders and high unit cost, fewer than 200 television stations had bought a VTR by 1960, and these naturally were the bigger stations in the larger markets.

The arrival of tape led to some

changes in television programming and production. It made editing much faster than with film because the tape did not have to be processed. It made special effects possible with the push of a button, and far cheaper than on film. It produced much higher quality than either kinescope recordings or film. Hollywood makers of film for television had to find ways of paring down their costs to compete with videotape, particularly with respect to series programs. Using an erase/rerecord (make/remake) system, one could easily remove a mistake in an original production. Audience participation shows, during which producers always worry about an obscenity or libel going over the air, could now be taped beforehand. Although shot-by-shot editing was a difficult and expensive procedure until new electronic devices were invented in the late 1960s, VTR gave the programmer greater flexibility. Some critics claimed, however, that actors rarely gave performances with the same intensity as in the "live" days, since they knew that a *fluff* or mistake could be removed, however expensively, before it went on the air. Above all, program production was no longer tied to air dates and hours. Although it took years for the full benefits of VTR to be felt, its potential was obvious from the start.

8•2 The Spurt in Station Population

Until 1958 or so, broadcasting was characterized by growth of AM and television and decline of FM radio. For the first time, growth in itself was questioned: How many AM stations could be accommodated without unacceptable interference? Was UHF anywhere near as good as VHF for television? Should stations in the same service—radio or television—in the

same market have roughly equal power and range? Was there enough advertising income to cover all the new stations? These were the have versus have-not arguments of previous decades, but now increasing numbers of three different kinds of broadcasting stations complicated the fray.

8•21 AM Growth and FM Adjustment

In 1945 radio engineers agreed that the spectrum could take only about 900 AM stations without undue interference. But, as the result of FCC relaxation of engineering standards for prospective station licensees after World War II (see 7.21), the number of AM stations grew to 2,400 by 1952. Again, many engineers thought that was the limit. But more than 100 stations were added to the list each year of the 1950s. As small stations went on the air in smaller towns, and more were shoehorned into the cities, the number of AM stations rose to 3,500 by 1960, and an average of 30 stations was operating on each frequency in the United States. This is misleading of course, as Class IV (local) channels had hundreds of stations squeezed on each, and a few of the Class I (clear) channels had only one or two stations on each.

This growth of AM was achieved at some cost. First, an increasing proportion—one-third in 1952, nearly one-half in 1960—of AM stations was restricted to daytime operation so that these stations did not conflict with other, usually older, stations at night, when radio waves travel farther (see Appendix B). More stations also had to use directional antennas to reduce interference. At the same time, power used by AM stations continued to climb, so that the 100 watt station became the exception rather than the rule. Local stations had to increase power—within

FCC set limits—simply to maintain adequate power in relation to other stations on the same frequency that had acquired higher power. By 1960, 18 percent of the 3,456 AM stations were on clear channels with all, except for a handful of Class I stations, using lower power, directional antennas, or going off the air at night; 54 percent were regional outlets using 5,000 or 10,000 watts of power; and 27 percent were low-powered (250–1,000 watts) local stations.

If nothing else, the addition of one thousand AM stations in the 1950s showed that, although network radio was dying (see 8.3), radio stations still were thought of as successful business opportunities. By 1960, virtually every American town of respectable size, and most suburbs of major cities, had their own AM radio station or stations.

On the other hand, more FM stations went off the air than went on. The 616 FM stations on the air in 1952 had shrunk to 530 five years later. Most were owned by AM stations, which duplicated their programming over the FM outlets and hung onto them in case FM should ever amount to anything. In several large cities, their owners kept FM stations on the air in order to hold what might become a valuable frequency. Few FM stations made money and most lost substantial sums. But the FM audience kept about the same size—mostly devotees of the few classical music stations that broadcast in the largest cities.

Other groups needing radio spectrum space soon began to eye the FM allocation. In 1955, for example, the National Association of Manufacturers petitioned the FCC to share the FM band with land mobile and other services with pressing needs. Two years later there was a similar attempt at spectrum “raiding,” and even television made a pitch for ad-

ditional VHF channels at the expense of FM (see 8.81). In each instance, the majority of the industry stood fast, and the FCC decided to leave the FM band alone. Still, the threat to reduce its number of channels was implicit if FM’s fortunes did not change for the better.

Then in April 1957 the trade weekly *Broadcasting* noted that, for the first time since the late 1940s, applications for new FM stations outnumbered stations going off the air. Several group owners of stations announced plans to set up separate programming for their FM stations and talk of an FM network was heard. Something was relighting FM’s fire. By mid-1958 there were 548 stations on the air, the first increase in a decade, and two years later there were nearly 750 commercial FM operations—an all-time high. Applicants were competing for the same channels in cities where shortly before no one had cared.

Subsidiary Communications Authorizations (SCA) for services such as storecasting were proven money-makers for FM outlets, but they could not alone explain what was happening. More important, especially in major cities, was the increasingly crowded AM spectrum. Since there was practically no room for a new AM station in any sizable city by the late 1950s, the only way to get a new radio signal on the air, especially at night, was to use FM. In addition, when television’s first major growth spurt (see 8.22) slowed down, investment money and labor became available for FM. The country was going through a cultural boom, and people discovered the independently programmed minority of FM stations that specialized in classical music. The production of FM receivers had picked up, with lower-cost imports from Germany and later from the Far East (see 8.71). Finally, transistor AM-FM radios, introduced in the mid-

1950s, had AFC (automatic frequency control) to prevent the annoying *drift* of tube-type receivers. All these factors helped break the vicious circle of no audience/no advertisers/no money for stations/no stations/no programs/no audience and finally produced the growth in FM which had been expected when it was approved for commercial operation in 1941. FM radio was still a secondary radio service, but the increasing number of stations on the air and growing audience suggested that it was here to stay.

8•22 *Rapid Expansion of Television*

When after four long years instead of the expected six months, the Freeze ended in April 1952 with the *Sixth Report and Order* (see 7.82 and 7.83), the effect was much like unplugging a pipe. The television industry almost exploded, growing from the 108 pre-Freeze stations in 1952 to more than 530 in mid-1960. Distribution, which had been very irregular with six or seven stations in New York and Los Angeles but no service in many areas of the country, evened out as many medium-size towns got their own television station. The number of single-station markets dwindled within a few years. No longer could one station carry the best or most profitable programs of all four networks—ABC, CBS, NBC, and until 1955 Dumont—plus its own local programming and make a huge profit from pitting advertisers and networks against each other. With the coming of a second and third station in many areas, each with a network affiliation—invariably, the last stations in a market of four stations wound up with ABC or Dumont—television competition in the modern sense began.

The end of the Freeze led to sta-

tions being established on the UHF band. Initially, hope was expressed—except by engineers, who knew better—that the new UHF allocations would provide universal television service, with a wide choice of programming. What too many applicants forgot, however, was that UHF stations had nowhere near the coverage of their VHF competitors—partly due to poor receiver design.

Station operators and advertisers soon recognized that the typical VHF station on channels 2–6 would give reliable coverage to 65–70 miles, channels 7–13 traveled about five miles less—and UHF stations were lucky to reach much past 30–40 miles (lower-numbered channels giving better service) even if sets had UHF tuners or converters. The FCC had tried to solve this problem by allowing channels 7–13 to use 316 kw of power as contrasted to the 100 kw allowed on channels 2–6; the UHF stations were allowed 1,000 kw (later 5,000 kw or 5 megawatts). Even with this adjustment, coverage differences remained—and canny advertisers placed most of their business with VHF stations. Compounding the problem, few UHF-capable receivers were produced in the early 1950s and even fewer after 1956. All pre-1952 sets, and about five-sixths of those manufactured between 1952 and 1963 could receive only VHF channels. If a UHF station was started in a town, owners of sets would have to buy new ones—and few did—or an *outboard* conversion device that cost \$30 to \$50 and attached to the antenna terminals. Since antenna placement was more critical for UHF, and since the converter rarely gave a picture as good as the picture from channels the set was engineered to provide, there was little stimulus for people to watch UHF stations if they had a choice. When there were more VHF than UHF channels in a market, the network affiliations and the better programs

went to the VHF, and most of the audience did not even know about the UHF. There had to be at least a two-to-one ratio of UHF to VHF for a majority of the potential audience to invest in all-channel sets or converters. Thus the typical UHF station could not compete, since it had a smaller coverage area and, within that, a meager audience. The combination was to prove almost fatal to UHF, and did result in more than 100 UHF stations going dark.

The FCC had decided to intermix VHF and UHF stations in the same market (see 7.83), supposedly to assure even competition. More than 100 stations started on UHF channels as soon as they could after the Freeze, each hoping to do as well as the pre-Freeze VHF stations. But shortly, after having spent hundreds of thousands or even millions of dollars, they found that few advertisers cared about UHF stations and their tiny audiences, and networks were uninterested in affiliating a UHF station, unless it was the only one in town—and even the network would switch to a nearby VHF station when given the chance. Within months, UHF operations were failing for lack of operating funds and audience interest.

Although VHF and UHF were regulated as one service, while they were not really equal, and FM as a separate service from AM, there was a strong parallel between UHF television and FM radio. Both services came after a sister service—VHF television and AM radio—had become entrenched. Both started strongly—FM in the late 1940s and UHF in the mid-1950s—only to fall quickly on bad times and decline in number of stations on the air. Both services lacked network affiliations and advertiser interest. Audiences were small because neither radio nor television owners cared to spend extra money for converters or new receivers. In both services, broadcasters with ownership in-

terests in the older, competing service had little concern for the newer service. In both cases, the best urban markets initially were filled with the older services, leaving only smaller markets, with less economic and political clout, as building areas for the newcomers. There were increasing threats in the 1950s that FM and UHF spectrum allocations would be divided with other services, as they were not fully being used by broadcasters.

Ironically the FCC and various congressional committees stated that FM and UHF were to be favored services. There were constant comments in official reports and hearings about moving the older radio and television operations over to FM and UHF frequency assignments, which were technically better and would at least put all operators on an even footing. At times the commission appeared like the nervous doctor who cannot pinpoint the ailment but is sure that further ministrations will help. FM started an upturn after 1957 but economic factors within the broadcasting industry caused UHF to continue sliding slowly downhill throughout the 1950s. New rules and legislation of the 1960s would give both secondary services a shot in the arm.

Thus, during the 1950s, television's commercial growth took place in the VHF band. The 108 VHF stations in 1952 had grown to 344 in 1956 and 440 by 1960, but the number of commercial UHF stations was only 97 in 1956—and 75 by 1960 (see 8.81).

8•23 *To Pay or Not to Pay: The Debate Intensifies*

To a number of struggling UHF operators and some who had gone off the air, there appeared to be one salvation: pay-television. In the postwar years (see

7.24), debates over the idea and some experimentation had started something of a battle between those in favor, led by Zenith, and those against, led by the broadcasting networks, motion picture producers, and theater owners.

Through the 1950s there were several developers of pay-television systems. Zenith's "Phonevision" system, which had been tested in Chicago in 1951 (see 7.24), sent a scrambled audio and visual signal over the air, and used a separate telephone wire to decode or unscramble it. The customer was to secure "decoding" information by mail, phone, or vending machine and set a five-number "code translator" attached to his home receiver to unscramble the transmitted signals. Zenith suggested that stations devote 15 percent of their time to pay operations and 85 percent to normal, advertiser-supported, programming. A second firm, Skiatron, planned to send its signals by wire, not over the air, and unscramble them by use of a printed electric circuit on a punch card, purchased at a neighborhood store, inserted into a box attached to the viewer's set. Though this system could be used over the air, Skiatron concentrated on establishing programming companies that would distribute programs only by wire. Telemeter also used a wire system, decoded by inserting the proper sum into a coin box on the home set. Various other companies, changing from year to year, used similar technology—although one proposed simply sending the unscrambled audio by telephone wire. Each firm claimed that pay-TV would provide new kinds of programming—cultural events, plays, sporting events then not seen on television, first-run films—and would do it without interruptions for advertising.

Arrayed against the pay-TV proponents were the broadcasting and most

of the film industries. They claimed that pay operations would spell the end of "free," advertiser-supported television. The pay operators would be able to siphon off whatever kinds of programming they wanted, since even a small sum per viewing home would amount to millions of dollars. In addition, pay-TV would inflate talent costs. It could pay higher fees than regular television did because it could pass all costs on to the viewers without worrying about pricing itself above rival advertising media. Finally, pay-TV would raise the cost of advertising since it would leave fewer viewers for commercially sponsored programs—at a higher cost-per-thousand to the advertisers.

Agitation for pay-TV grew following the 1951 Zenith demonstration and a later, six-month test by Telemeter, owned by Paramount Pictures, in the exclusive desert community of Palm Springs, just outside the Los Angeles market. The test was limited to 200 subscribers, and few results ever were announced. In September 1954 Skiatron—following Zenith's example of 1952—formally asked the FCC to approve regular pay-TV operations, inviting support by suggesting that only UHF stations could be pay stations—for the first three years, anyway. In spring 1955, the FCC held hearings on the proposal, and government policy makers and the public were inundated with petitions, newspaper editorials, booklets, reports, and other propaganda on both sides. Many public opinion polls, other than those commissioned by broadcasters, favored giving pay-TV a chance. But opponents convinced some powerful figures in Congress that what seemed attractive to some would mean less "free" television to many. This produced several bills to outlaw pay-TV, but none reached a vote.

In spring 1956, the FCC proposed

a two-to-five year test to determine the viability of pay-TV. It would limit the test to programs other than those then aired over commercial television, to cities with at least three operating stations, and to UHF outlets. This proposal merely inflated the debate. In October 1957 the commission issued its First Report on pay-TV, providing specifications for putting the test into practice. Any of the various pay-TV techniques could be used, only 20 markets could be affected at one time, and a given system could be tried in up to three cities.

In the meantime, an extensive test of pay-TV by wire was taking place over a Bartlesville, Oklahoma, cable system. Making use of two different channels, and offering programs from noon to midnight at \$9.50 a month, this system depended heavily on first-run films shown repeatedly over a short period. The Bartlesville operation started with 800 subscribers, but after the novelty wore off the number dwindled and the form of payment was changed from a monthly fee to a per program charge. When the operation closed down in April 1958, it was losing \$10,000 a month. Operators blamed the loss partly on the release of newer films to commercial television (see 8.62). Pay-TV enemies heralded this failure as proof that people given a choice between regular television and pay-TV would shun the latter. (Although there are similarities between this experiment and the pay-cable operations of the 1970s, there was no attempt in the 1950s to identify CATV with pay-TV, particularly as the few CATV systems could not carry many signals and had not yet entered the larger cities where pay operations would be most profitable.)

Just as the Bartlesville test was proving too expensive to continue, a House committee held hearings and in February

1958 issued a “sense of the Committee” resolution asking the FCC to delay application of its 1957 rules until Congress was able to consider and act. In the face of this pressure and a huge flow of mail, the FCC hastily issued a Second Report postponing pay-TV. But there was little movement in Congress, and the FCC’s Third Report of February 1959 provided specifications for a more limited test of pay-TV. After more FCC and congressional hearings, only three applications were filed and only one of these resulted in an actual test in the United States (see 9.22).

One test market was explored in the late 1950s. Telemeter offered pay-TV programs to Etobicoke, a suburb of Toronto, Canada. The 1,000 subscribers paid a \$5 installation charge and a per program fee for use of any of three channels, two of which carried only movies. Telemeter claimed to have 3,000 families on a waiting list and estimated that it might reach 5,000 homes by late 1960.

Indicating the validity of commercial broadcasters when they warned that pay-TV would funnel off popular programming, Skiatron contracted with the Giant and Dodger baseball teams, then recently moved to California from New York, to telecast only on pay-TV. This scheme failed when the Los Angeles City Council refused to sanction a pay-TV system in the city.

And there pay-TV stood—about where it had in 1952 insofar as hard data on its potential was concerned. But the passing of time worked against the on-air pay-TV proponents. As commercial television expanded and offered more feature films, the financial and programming rationales for pay-TV faded. Backers of pay systems tired of fighting other industries, FCC bureaucracy, and congressional indecision. And the audience did not seem

to care, judging from the nebulous success of the pay-TV tests.

8•24 *The Expansion of Cable Television*

Cable television did not create much controversy initially (see 7.83), and it grew fairly quickly in the mountain areas of Pennsylvania and the Far West. By 1952, some 70 systems served 14,000 subscribers. Typically, for an installation fee and then a monthly charge of about \$5, a subscriber got one or more signals "imported" from afar. By 1960 more than 650,000 television set owners were reported to be subscribing to 640 fairly small and local cable systems. Television stations in this period usually welcomed the cable operations because they provided more listeners for a station's programming.

At this time *cable* and *pay* television were very different. Cable subscribers paid a set fee for being hooked to the system and a monthly charge for reception of some or all the stations they could not receive directly off the air. Pay-TV viewers paid "per program" and usually could receive "free" programs as well. The line between these two types of service was to merge in the late 1960s when, ironically, over-the-air pay-TV had faded in potential importance while the innocent-appearing CATV systems had become one of the broadcast industry's major problems (see 9.83).

8•3 *The Domination of Network Television*

The broadcasting trends apparent in the late 1940s continued to the point where the radio webs had shrunk to little more than AM news outlets by 1960 and

television networks were almost entirely VHF affiliates.

In 1952, half the AM stations on the air were affiliated with one or more networks, but by 1960, although there were 1,000 new stations, only one-third of AM stations maintained affiliation, including less than 10 percent of the stations beginning in this eight-year period. Clearly, the networks no longer dominated radio programming and economics in an era when all attention—including that of network personnel—was turned to television. In the early 1950s, network radio cut its rates in an attempt to retain advertisers, but most sponsors preferred television or spot advertising on individual radio stations. Many major stations gave up network affiliation to program on their own rather than be tied to a system that failed to attract listeners. The Westinghouse Broadcasting Corporation, a major group owner, pulled four stations out of NBC in August 1956 to go to fulltime local programming. Many other stations stayed with the networks but only for their news services and those daytime programs that retained some following (see 8.61).

What had been the largest network in affiliates, Mutual, fell on hard and scandalous times. From 1956 to 1959, ownership of the network changed six times, with one management convicted of stock manipulation and another accused of selling a guarantee of favorable mention on its news programs to Dominican Republic dictator Rafael Trujillo. As a consequence of all these factors, more than 130 stations dropped their Mutual affiliation.

The other radio networks drifted along in the wake of television. Ironically, some "new" radio network programs derived from television shows. The only real program innovation of lasting importance in the period was NBC's *Monitor*, which

began in 1955 as a 40-hour over-the-week-end “magazine” program. The combination of talks, interviews, news, music, comedy, and sports was a hit with listeners and advertisers.

The only major attempt at FM-only networking, the Continental Network (see 7.31), was unable to expand beyond the East Coast, except for mailing recordings to other affiliates. This limited experiment ended early in 1954 with the suicide of FM inventor Edwin H. Armstrong, who had been quietly paying for telephone line interconnection of these FM stations. Several regional FM interconnection arrangements dried up at the same time. Even at their peak, they too had been limited to the Northeast.

More than anything else, the middle and late 1950s were marked by the domination of network television—and that meant NBC and CBS. But this period also saw the demise of one nationwide network and the bare survival of another.

The first was Dumont, the only television network not built on radio. Although it was fragile from the start, the network did not stop operations entirely until late summer 1955. Dumont’s chief problem was always being number four at a time when most markets had fewer than four stations. CBS or NBC had first pick of affiliates, with ABC or Dumont clutching at the leftovers. Stations with more than one network affiliation—common in the 1950s—hardly ever chose to carry Dumont programming, and advertisers understandably shied away from placing ads few would see. Thus Dumont made only one-third to one-tenth of the revenue of the other networks. In January 1955 Dumont was feeding only 21 hours a week—the three prime time hours each night—and by August, although it claimed to have 160 affiliates, it was down to just over

five hours a week. Dumont then sold its profitable Pittsburgh station and withdrew to manufacturing and research activities, later selling its stations in New York and Washington, D. C.

The network that barely survived during this period was ABC, which had had many financial crises and always seemed to arrive at a television idea just after CBS and NBC had been there and cleaned up. The end of Dumont cleared time on some stations for ABC programming, and the ABC–Paramount Theaters merger (see 7.32) provided money needed to pay debts and update facilities of their O & O stations. But ABC lacked a star vehicle on which to build audience popularity, something analogous to NBC’s early use of Milton Berle. All networks wanted such a boost, and for once ABC was the winner. Early in 1954, ABC signed a contract with Walt Disney Productions to air some of the “appeal to the whole family” Disney films and a new Disney-developed family television program. That show, premiering in fall 1954, was *Disneyland*, which was followed a year later by *The Mickey Mouse Club* afternoon children’s program. The huge popularity of these two programs improved ABC’s image and appeal to advertisers. This and the increase in three-station markets following the Freeze improved ABC’s competitive position with CBS and NBC by the late 1950s.

All television networks went through important evolutionary changes in these years. Probably most important, the networks were increasingly producing and controlling their own programs. This trend away from sponsor or agency programming control was to come to a head with the quiz show scandals (see 8.63 and 8.84). Second, after 1954 the networks relied less on half-hour or hour series pro-

grams and offered more *specials*, one-shot plays and documentaries of longer duration (see 8.62). Third, the networks were making initial investment in color equipment and programming, although only NBC, on behalf of its parent RCA, was actively promoting color (see 7.821). Like the special programming, the move to color was mainly for the sake of prestige. Hence, NBC consistently offered most color hours, followed by a reluctant CBS, with ABC not even in the running until 1958. From a total of 68 hours transmitted in 1954, color programming rose to nearly 500 hours in 1956 and more than 650 hours two years later. Nearly all the color shows were specials and most were live or on film, as color videotape recording was not yet perfected.

There were few color productions—650 hours a year is less than two hours a day—because color equipment and color broadcasting were costly, CBS and ABC were reluctant to support RCA's manufacturing adventures, and not many expensive color television receivers were being sold (see 8.71).

In the early years, most network productions had originated in New York or Chicago. By 1955–1957, however, nearly all production activity had moved to the West Coast, as television drew more heavily on Hollywood's hungry film (see 7.91) production talent pool. The shift left administrative and fiscal control in New York and creative work in Hollywood.

In these years the networks had

Sarnoffs and Weaver: NBC's Executive Team / David Sarnoff (left), operating head of RCA almost from its start in 1919, is seen talking with NBC/TV Network (1949–1953) and NBC president (1953–1955) Pat Weaver (center)—creator of the concept of "spectaculars" and the *Today* and *Tonight* shows—and his son Robert Sarnoff (then NBC chairman), who was to lead RCA after the senior Sarnoff's retirement in 1969. The younger Sarnoff was fired in 1975. Their CBS competitors are shown on page 261. Photo credit: Indelible, Inc.



their greatest influence over television development, for without an affiliation a local station was almost doomed to failure. NBC had the most affiliates, although its proportion dropped from more than 55 percent to about 42 percent of all stations between 1953 and 1960. CBS started the period with half as many affiliates as NBC but ended with nearly the same number. ABC was one-third to one-half the size of its two competitors (see Appendix C, table 3).

NBC's programming was dominated at first by network president Sylvester "Pat" Weaver, the driving force behind the radio network's *Monitor* (see above) and such television innovations as *Today* and the specials. But the real power in NBC was synonymous with the power in RCA, and soon RCA Chairman David Sarnoff's son Robert, who had earned his programming spurs as producer of the award-winning documentary series *Victory at Sea*, took over the operation of NBC. CBS continued under the leadership of Chairman William S. Paley and President Frank Stanton and a succession of television network presidents. Both networks had to face almost continuous investigation by Congress and the FCC (see 8.82) into monopolistic tendencies of networks in general and these two in particular.

After the Dumont demise, each network owned its full complement: five VHF stations. Not wishing to enter the unprofitable markets, each concentrated on the largest cities and shunned ownership of the two permitted UHF stations, although both CBS and NBC owned one or two for short periods. Ironically, ABC, the weakest of the networks, had the best O & O lineup: a station in five of the top seven markets (albeit on channel 7), with ABC as the original licensee. CBS and NBC, on the other hand, bought and sold several stations in the 1950s, jockeying for

ownership of the most stations in the top five or six markets (see box on page 266).

This led to a strange deal between group owner Westinghouse and NBC. In 1955, NBC offered to buy KYW-TV, Westinghouse's Philadelphia station, in exchange for NBC's stations in Cleveland plus \$3 million. Westinghouse probably would not have considered the deal except for NBC's threat to withdraw television network affiliations from other Westinghouse stations if Westinghouse did not accept. The swap took place in 1955. A year later, the Justice Department accused NBC of coercing Westinghouse with the threat of affiliation cancellations. After several years of FCC and court actions and appeals—and the intervention of other parties who hoped to gain from the situation—the FCC decided on *status quo ante*: to put everything back where it was before. In 1964 Westinghouse returned to Philadelphia, keeping the \$3 million, and NBC went back to Cleveland. Observers who saw the initial deal as an example of raw network power concluded that concentration of network ownership of stations in the country's largest markets might be outside the public interest.

8•4 The First ETV Stations

A small number of groups and individuals had lobbied to get channel reservations for educational television (see 7.42 and 7.825) and had succeeded with the *Sixth Report and Order's* reservation of 242 channels. Lobbying effort then switched from national to state and local governing bodies and other sources to obtain money for such stations quickly, for the FCC had reserved the educational allocations for only one year, after which commercial applications might be accepted. Though later extended indefi-

nately, the deadline provided the impetus to get stations on the air. The Ford Foundation, working mostly through the Fund for Adult Education (FAE) and the Fund for the Advancement of Education (also FAE), provided seed money for the campaign. The National Citizen's Committee for Educational Television was formed to convince the public of the potential values of educational stations. Their job was (1) to sell the notion of educational television to universities and other groups which would serve as licensees; (2) to gain public interest and organized action in favor of such stations for alternative programming; (3) to convince community leaders that such stations would be outlets for local talent and local government and other agencies in action; and (4) to save the ETV channel reservations from commercial pressure for reallocation.

A milestone was reached when the first educational channel on a reserved frequency took to the air—the University of Houston's KUHT, in May 1953. (WOI-TV, at Ames, Iowa, was on a pre-Freeze non-reserved channel.) The second station was KTHE on channel 28 in Los Angeles. However, its sponsors, the University of Southern California and the Alan Hancock Foundation, had financial and other difficulties, and after several months it went dark—the only ETV outlet forced to close down. Los Angeles was without an ETV station until KCET, Community Television for Southern California, reactivated channel 28 in 1964. Station growth was slowed in the process of raising tax monies, foundation support, or aid from other sources. In many cases, commercial broadcasters donated help and equipment to educational stations—sometimes in the nick of time. These altruistic-seeming donations also prevented or discouraged new competing commercial stations, since an ETV station in a market occupied a channel but

rarely attracted a large audience. Also, the ETV station provided cultural and special-interest programs to small audiences and reduced the pressure on commercial stations to carry such programs. In mid-1955, there were 12 ETV stations on the air, by 1958 there were 35, and by 1961 there were 51, but half the states had none. As with commercial channels, most of the reserved frequencies were UHF—182 of the 274 reservations the FCC had made by 1960—but as with the commercial outlets, most of the early ETV stations were on the VHF band.

Once on the air, the educational broadcasters had to fill their operating hours. Having no network to provide programming, and being unable to use ordinary television fare, most ETV stations operated for only a few hours a week. Some of these were devoted to in-school broadcasts, sometimes paid for by school districts, and others, to cultural and entertainment programs. Even by 1959, the typical ETV station was on the air for only 35 hours a week, half the time of the typical commercial station, and used mostly local productions. However, in May 1954 the National Educational Television and Radio Center was established in Ann Arbor, Michigan—it later moved to New York City—and began to provide several hours of programs to the four stations then on the air. By 1958, 30 stations were getting a minimum of six hours a week from this cooperative, chiefly as kinescope recordings or film. By 1959, having lost interest in radio, it supplied members with eight hours of programming a week—a quarter of all ETV programs. Major producing stations were WGBH (Boston), WQED (Pittsburgh), WTTW (Chicago), and KQED (San Francisco). The programs were distributed by mail, in a bicycle network from one station to the next.

Most ETV stations were under the control of a single educational institution,

usually a college or university, although some school boards were interested. A few were genuine community stations, managed by nonprofit associations, with representatives from appropriate educational and civic agencies. Alabama was the first to establish a state network of several educational outlets offering concerted programming (see 9.82). Other states followed suit as funding became available.

Educational stations generally offered two separate types of programming: programs with general cultural content—adult education, foreign films, public affairs, general educational material, concerts—and instructional television (ITV). ITV was designed for the classroom (broadcast or closed circuit), or for individual viewing as a series of instructional units from kindergarten through college, for which credit could be given. The first purely instructional effort by a commercial national network was NBC's *Continental Classroom*, which began in October 1958, airing from 6:30 to 7:00 A.M.(!) It began with a series of lectures on nuclear physics and dealt over the years with many other subjects. This program obviously was not aimed at everyone, although some of its loyal viewers were able to arrange local college credit for the work done via television.

8•5 Advertising: Local Radio and National Television

There is a myth among broadcasters and students of broadcasting that radio began to lose money in the 1950s as television was beginning to make it. While the importance of radio and particularly radio networks in national advertising did decline, its income increased during this period. However, as the pie was sliced in more pieces, radio and television ex-

changed positions until in 1960 television was receiving twice the advertising dollars of radio—but radio kept making money.

What *did* decline was the economic clout of radio networks. In 1952, the webs still took in 25 percent of radio advertising revenues, but as more unaffiliated stations went on the air and advertiser interest in radio networks declined, that share plunged to 6 percent in 1960. In the same period local advertising revenues, already 52 percent of radio income in 1952, increased to 62 percent by 1960. NBC was hit harder and faster than CBS, partly because many NBC shows had lower ratings—a possible result of the 1948 CBS “talent raid” (see 7.61).

Individual stations adjusted to the changing advertising pattern as it was affected by the audience size and interest pattern. In the 1950s, evening prime time, which formerly drew the biggest radio audiences, gave way to morning and evening “drive time,” when people in autos were on their way to and from work. In larger cities drive time was more easily sold and brought in greater revenue. Some local stations took over their own programming and sold their own advertising so that they could retain all the income, rather than the small fraction passed on under network arrangements. Still, roughly one-third of the AM stations, particularly new ones, were losing money in 1960. Broadcasters found out again that the advertising pie could be successfully divided just so far.

This problem was especially acute for the independent FM station operators. As an industry, FM radio never made money and almost all stations were in the red, though total FM income jumped from \$2.6 million in 1952 to \$9.4 million in 1960.

Overall, radio as an advertising medium declined from 9 percent of all advertising dollars in 1952 to 6 percent in 1960. But, as advertising in general in-

creased throughout the Eisenhower years, radio's total revenues increased from \$624 million in 1952 to \$692 million in 1960. So the economic changes in radio were mainly changes in pattern. Most radio stations operated with an adequate profit margin, and the larger clear-channel stations made excellent profits.

Television's income increased spectacularly in these eight years, growing from \$454 million in 1952—about 6 percent of all advertising expenditures—to over \$1,600 million—13 percent of all advertising—by 1960 (see Appendix C, table 5). But television pattern changes were opposite to radio's. Local advertising declined—from 23 percent of television revenue in 1952 to 17 percent in 1960—as did network advertising—from 57 percent to 50 percent—while spot advertising increased from one-fifth to one-third of all television income. The networks' own income increased, but their proportion of the pie dropped as many non-network-owned stations came on the air.

It has been suggested by both broadcasters and their critics that a television license was, in effect, "a license to print money." A VHF station with a network affiliation, as nearly all had, usually was in the black within a couple of years of going on the air even though establishing it frequently took \$1 million or more. Unfortunately, and not unexpectedly, this profitable picture did not extend to UHF stations. Although only about half the operating UHF stations were losing money in 1960, many others had failed for lack of income or operating capital. With their more limited range and often without network affiliation, UHF stations had too small an audience to interest national and regional advertisers. They attracted only local advertising, aside from some national spot business, and some independent UHFs had a reputation for low standards

of advertising acceptance. Quarter- and half-hour programs that consisted of advertisements with a bit of entertainment thrown in to hold viewers were common. Many UHF stations did not subscribe to the NAB Television Code (see 8.85) simply because they had to sell all the commercial time they could, regardless of how many spots were aired in an hour, or type of products advertised. Although UHF rates were lower than competing VHF station rates, UHF stations could not attract more business and thus make up for the lower rates per spot because advertisers wanted to reach the largest possible audiences in each market.

On the networks, and to some extent on local stations, an important change was taking place in sponsorship patterns. In 1952, one advertiser normally sponsored an entire program, just as in radio. Some major manufacturers of consumer goods controlled several programs, particularly daytime shows. In 1951, for example, Procter & Gamble had become—and still is—the biggest television advertiser, as it had been in radio, with several daytime soap operas and evening programs. But as the television audience increased, as programs got more complex, and as talent and technical personnel demanded larger salaries, programming costs went up sharply (see 8.62). Networks, being able to cover their increased expenses without having a cost-per-thousand greater than competing media, raised their advertising rates until, by the late 1950s, half-hour or hour network programs were beyond the reach of many advertisers.

Starting with longer programs, and then with shorter series episodes, networks began to develop new types of advertiser support. First appeared alternating or shared sponsorship, where two noncompeting firms would share the sponsorship of a single program by alter-

nating weeks or some other segment. In this way they cut their costs while maintaining a regular identification with the program and exposure to potential buyers. One of the first programs to make this approach popular was the Arthur Godfrey radio variety program, which was sold in 15-minute segments to participating advertisers. Television's *Today* operated the same way. Daytime and then prime-time programs required shared sponsorship as costs continued to rise. By 1957–1958, about half the network shows were still fully sponsored by one firm, while 28 percent were under an alternation arrangement, and 20 percent used a participating format, where advertisers regularly purchased time for their spots in a particular show. By 1960 this was the standard for specials and hour-long series, while full or alternating sponsorship still was prevalent for half-hour shows. (*Participating* advertising was placed within a designated program, and *spot* advertising was placed anywhere in the station's schedule according to the class of time, based on audience size, purchased by the advertiser.) Both spot and participating advertisers paid a rate that covered the advertising time, a *pro rata* share of the program adjacent to the spot, and a profit for the program packager, usually a network. When advertising agencies relinquished television programming control to program packagers and networks, spots were sold without sponsorship, and the two-decades-long relationship between sponsor and program, amounting to sponsor control of programming, broke down.

Television time rates and the cost of production became prime issues with advertisers. In the late 1950s, production of a one-minute commercial cost between \$3,000 and \$15,000, depending on the degree of production difficulty. In the years under discussion, talent costs went up 60 percent to 85 percent, a major part of an

overall 20 percent cost increase. On top of the production cost and the cost of duplicating and distributing the filmed commercials themselves—which was, of course, spread over a number of airings—the advertiser had to buy network time. Full sponsors had to absorb costs that for a prime-time hour rose from \$33,000 in 1952 to more than \$87,000 by 1960, and spot advertisers had to absorb their share of the costs. These expenses, even with good results in sales, drove many smaller firms out of television advertising and back into radio or print, while big national firms made heavy use of national and regional television. But numerous television advertisers grew from almost nothing to highly profitable size in a few years because of their sponsorship of a popular program. Probably the best example was relatively unknown cosmetics maker Revlon, which grabbed a major portion of the cosmetics market through its sponsorship of highly popular quiz shows during that format's heyday of the late 1950s. While some such successes later evaporated, Revlon held its improved product position despite the quiz show scandals (see 8.63). On the other hand, when research demonstrated that many children watched the Lucille Ball program, a tobacco company sponsor dropped the program. Although it was the most popular show on the air, it did not reach enough *smokers* to pay off.

8•6 Programming Trends in the Fifties

While advertiser and audience interest was centered on television programming developments, radio—even network radio—did not dry up and blow away. The rise in revenues during most of this period (see 8.5) suggested that radio stations had to be doing something right; neither the

influx of new radio stations nor program competition from television was killing them. Television was firmly established by 1952, and was falling into recognizable program cycles much like those radio had experienced.

8•61 *Revival of Local Radio and Coming of Top 40*

The late 1950s marked the end of network radio. Even in the early and mid-1950s network schedules resembled the great days of the two previous decades in that a variety of sponsored programs were available day and night. Interestingly, at no time before or after the 1953–1954 season have the radio networks presented so many programming hours per week. But by 1956, the total began to drop off sharply. The first signs were (1) simulcasting of popular shows on radio and television, and eventual transition to television alone, and (2) the continuing broadcast of sustaining programs for prestige and to create the semblance of a going operation.

In the evening, formerly prime-time, hours, only variety and musical programs and various types of talk shows increased in hours per week after 1952. The light music format, which had not been popular on network radio since the 1930s, returned in the late 1950s with 15- and 30-minute filler programs built around singers—similar to television offerings of the same period. The only markedly different radio format was NBC's *Monitor* (see 8.3).

This is not to say that all creative talent had left radio for television. A variety program, the *Big Show*, was one of the most ambitious ever attempted of its type. NBC produced an adult science-fiction program called *Dimension X* (later retitled *X Minus One*). Two decades later, when NBC rebroadcast many of the orig-

inal episodes, they played well—even in an era of space flight. A major evening program format in the late 1950s was news, and by 1956 there were more hours of news broadcast than any other type of network program. Today, of course, news is the main if not only reason for the existence of radio networks.

Soap operas continued to dominate daytime radio, although they were heard for one-half and then for only one-third of their previous hours per week. The soaps were one of the last bastions of advertiser support in network radio at a time when most network shows had become sustaining, partly because many soap operas were owned and produced by their sponsors. Another lasting network radio daytime program format was the general talk variety program, including Arthur Godfrey on CBS and Don McNeill's *Breakfast Club* on ABC.

But total radio network hours on the air dropped drastically in the late 1950s. Local affiliates first dropped sustaining musical programming because they wanted to go their own ways, and then most of the remaining sponsored programs except news because they made insufficient income to warrant network costs. Many affiliates no longer automatically cleared time for network shows. The last radio soap operas and evening dramatic programs died in 1960. *Gunsmoke*, one of the latter, was converted to an extraordinarily popular television program that lasted more than two decades. Present to the end was a version of the show that had given network radio its first impetus—*Amos 'n' Andy*. The blackface program had converted in the late 1950s from situation comedy to musical variety with short comedy bits between popular tunes, but it too was eventually dropped. In place of these vestiges of big-time radio, CBS announced a new programming plan, intended to pre-

The End of Radio's Daytime Serial: 1960

Friday, November 25, 1960, 2 p.m. Eastern Standard Time, marked the conclusion of one of the most distinctive eras in domestic mass communications; after nearly thirty consecutive years of broadcasting the radio soap operas had reached a conclusion. "Goodbye, and may God bless you," Ma Perkins told her loyal audience as she finished her 7,065th and final broadcast. Young Dr. Malone also bid "a sad goodbye" to his audience. The Second Mrs. Burton did the same, introducing members of her cast for quick goodbyes. Local radio stations along the CBS network line continued with their transcribed spot announcements, time signals and station breaks as radio moved relentlessly forward, never pausing to mourn the departed nor, indeed, even heeding their loss. . . .

A major drop-off began in 1955 when only nineteen serials were renewed for the Fall season. Among those which did not return were such veterans as "Lorenzo Jones," "Stella Dallas" and "Just Plain Bill." The total dropped to sixteen in 1956, ten of which were on CBS and the remainder equally divided between NBC and ABC. They were discontinued altogether by ABC the following season. There were virtually no changes in 1958 but the 1959-60 season represented another serious diminution. NBC listed but one serial, "True Story," and CBS, dropping "Backstage Wife," "Our Gal Sunday" and "Nora Drake," was down to seven titles. NBC discontinued its only serial, along with its other entertainment programming, at the end of the season and "Helen Trent" was dropped from CBS.

The 1960-61 season began with a total of six serials, all on CBS and all on borrowed time. The programs were owned by sponsors who were no longer interested in using them. Rather than discontinue the serials entirely, CBS chose to lease the properties by paying royalties to Procter and Gamble and other owners. Other sponsors were then sought to fill the four commercial positions within the programs. No regular pattern was followed in this application of spot advertising and there was none of the earlier commercial identification with a particular serial. Only half-sold through most of 1960, they dropped to 25% sold toward the end of the year. "Best Seller" was introduced by the network in a final attempt to instill new vitality in the daytime serial by dramatizing novels but it was too late. Affiliated stations increased their efforts to force discontinuance of the serials altogether, determined to obtain release of the time for local sales and operations. In mid-August CBS announced that the last Friday in November would be the final broadcast date for the remaining serials. Each program thus had time to tie all of its loose ends together and to resolve its current complications. Significantly, none closed with such finality that the plot could not be resumed on a moment's notice.

Source: George A. Willey, "End of an Era: The Daytime Radio Serial," *Journal of Broadcasting* 5:97-115 (Spring 1961), pages 97, 102-103. By permission.

serve the physical network for prestige, emergency, and news: 10 minutes of news on the hour supplemented with five-minute feature shows during the day, and a loosely formatted Arthur Godfrey show. Period.

In the 1950s the networks changed from controlling their affiliates to merely supplying them with part of their program input. By 1960–1961, radio networks were set in a mold which was to survive into the 1970s: news on the hour and little else. But in a changing and frightening world, special news events were to remain radio's forte, as it could deliver flash or bulletin stories faster than television or any other medium. Almost any other program carried on radio—political conventions, sporting events—also was carried on television, albeit with different commentators. Radio networks became vestigial. Stations without network affiliations offered a minimum of “rip ‘n’ read,” or “yank ‘n’ yell,” newscasts, composed of the wire services' five-minute summaries read by a disc jockey. However, in times of great stress or national disaster the networks often allowed independent stations free use of their coverage.

With radio networks no longer providing programs or income to local stations, by the late 1950s radio stations had to use their own resources for the first time since the 1920s. Most stations followed the networks with a music and news format, soon known as standard (later MOR—middle-of-the-road), which usually meant trying to program a bit of something for everyone, with emphasis on vocal and orchestral popular music. Traditional radio sound lingered in such operations, which offered recorded music about half the time, sometimes adding local talk or variety programs, and in general aimed for the widest and largest possible audience.

While a majority of radio stations

followed an MOR format in the 1950s, a new trend was developing. Freed from the restraints of network shows and schedules, and seeking ways of attracting listeners in markets with increasingly competitive radio stations, stations in several cities began to specialize in a particular kind of music. This was not new; there had been classical music stations, usually FM, and, in some rural areas, country-and-western (C & W) music stations. Now stations in markets with a substantial black population began to program to that audience with “rhythm and blues.” There were perhaps 20 such stations in 1952 and about 50 by the end of the decade. Stations that went to a background orchestral “good music,” or *wallpaper*, format with little or no talk frequently were engaged in store-casting (see 8.11), and were among the first to adopt automation for assembling and playing the day's programming.

The format that was almost to take radio by storm began slowly. Looking at sales of phonograph records, program directors in several stations decided to emphasize the tunes that were selling well, either as records or sheet music. Station owner Todd Storz in Omaha and theater and station owner Gordon McLendon in Dallas are often given credit for originating what quickly was to become known as *Top 40* radio by the late 1950s. Storz tried the idea as early as 1949, bringing it to full force by 1953–1954. He operated in major markets while McLendon adopted the format in smaller and medium-sized markets because the formula was relatively inexpensive. Essentially, they created a tightly controlled, fast-paced format that usually involved playing each hour a certain number of what program directors, disc jockeys, and a growing number of “tip sheet” newsletters expected to become hits, three or four “top ten” tunes as measured by record sales, an old favorite—as time went

on, “old” might mean anything out more than a few months—and fast-paced orchestrals and vocals. The tunes were divided by spot commercials, frequently delivered by the disc jockey, weather forecasts, time announcements, and news on the hour. Strong station identification became more important than selling the network or a local or network program. The process of station identification became an art far beyond the mere repetition of station call letters and city required by the FCC. The jingle, used extensively for commercials in the past, was revived to give a station a specific image. Identity built on call letters, frequency location on the dial, or key talent, was constantly repeated until listeners knew it by heart. Directly tied to station identification were the station’s on-air staff, who grew from mere announcers into *disc jockeys* (DJs) or, after station publicity people got involved, *personalities*. Their stock in trade was to create a specific approach to the music, intermixed with talk, jokes, and comment usually delivered at a rapid pace with little or no “dead” air space or silence.

Thus was born *formula* or *Top 40* or *rock* radio in 1952–1954. It expanded from about 20 stations in 1955 to hundreds by 1960, although most imitators copied the outward format of the pioneers without really understanding the formula. It was a unique format that only radio could accomplish. It was aimed at teenagers, who were the fastest growing segment of the population, had growing disposable income, and had plenty of time to listen. Time and time again, an MOR-format station would take the plunge and achieve dramatic increases in listeners and income. When one rock station played the same music as another, with much the same sound, the personalities on the air contributed tremendously to a station’s success. An unknown announcer named Alan

Freed came out of Ohio to become one of the most important jocks on a New York radio station, and soon worked himself into a commanding position in the music world. Another, Dick Clark, became almost an industry unto himself first in radio and then television, in Philadelphia (see 8.62). Similar radio personalities soon were affecting everyday life and manners of the youth of most major cities, and attracting negative comment from persons who disapproved of those manners and that music.

While radio always had been an important adjunct to sheet music and phonograph record sales, Top 40 radio personalities now developed virtual life-or-death power over popular music record makers and sellers. If a song was played, it usually meant instant success and profit, and even an excellent record was doomed to failure if it could not get an airing on one of the key Top 40 stations. Thus, the jocks (and sometimes even program managers) at the 50 kw rock ‘n’ roll stations in New York, Chicago, St. Louis, Los Angeles, and Philadelphia suddenly found themselves waited on hand and foot not only by their fans but by recording groups and record salesmen who depended on radio. Many disc jockeys responded to this adulation and flattery by accepting payments, gifts, and favors in return for playing specific records, always asserting however that they played only those records they had judged to be good. The *payola* business became a public scandal (see 8.84) at the end of the decade to match that of the television quiz shows, and a degree of cleaning up was instituted.

For most of the 1950s, the important thing was combining records and radio to create instant events in the minds of listeners—the task of the disc jockey. Reflecting the times, the DJ had to get popular stars and music on the air without making radio sound Negro-oriented, even

The Rise of Formula Radio / With formula or Top 40 radio, radio became more than a carrier of media content originating elsewhere; it became central to a type of entertainment.

Rock's radio and record orientation is critical in distinguishing the music as a folk idiom. Although rock was not the first folk music style to use records and radio, it was the first to express itself *primarily* through these mechanical, impersonal media. Before rock, popular records and radio shows were inspired by live situations—Broadway shows, nightclub performances, and other personal appearances of a group or individual. Radio tried to duplicate these situations; Pop disk jockeys like Al Jarvis and Martin Block described “make-believe ballrooms” which created the atmosphere of a large dance hall, and in which songs were experienced as if a particular musician were performing in person instead of on records. Similarly, folk music traditionally emerged from live situations—from groups sharing a common experience of work or play, or from an individual singing to his people. With rock, however, records became the primary, common bond among artists and listeners, and radio shows provided the primary, common situation in which the music was experienced. Without consciously describing a hootenanny or trying to elicit the atmosphere of one, the rock radio show generated the experience of a folk gathering. The unique feature of this experience was that it existed only in the mind and emotion of the individual listener; he did not pretend that the records he heard were anything but records, because the sounds he absorbed were realities in themselves.

The rock disk jockey played an instrumental role in this experiential folk reality. Because he spontaneously participated in the event—rather than structuring it and separating it from himself by assuming the role of a detached “master of ceremonies”—he encouraged the listeners to react in equally spontaneous and personal ways. Moreover, when the disk jockey audibly hammered the beat to one of his favorite songs, or sang a few of its lyrics, and when he breathlessly read the news, weather and sports, he gave the radio show a pace which—to listeners accustomed to an older radio style—caused everything to blend indiscriminately together. But this style also surrounded the show with a total atmosphere that was typical of rock. In the dense fabric of sounds which characterized the radio event, the records assumed the imprint of performances and the show assumed the immediacy—although not the illusion—of a live folk gathering.

With rock, the radio and record media assumed lives of their own. They became ends in themselves instead of means to other ends.

Source: Carl Belz, *The Story of Rock* (New York: Oxford University Press, 1972), pages 46–47. By permission.

though much of the impetus for what Alan Freed titled *rock 'n' roll* was the blacks' rhythm and blues. Program directors were concerned that too much "black" sound would alienate their basically white suburban listeners, and thus the early rock stars, except for Chuck Berry, were all white. The first star was Bill Haley and his Comets, who mixed country and western with the new rhythm. In 1956 the first rock superstar arrived—Elvis Presley, a former C & W singer whose career rose dramatically after he appeared on the Ed Sullivan television show. The cameras were limited to shooting him from the waist up, since his pelvic gyrations were deemed too hot for television—or at least for Sullivan. Viewers of the show heard little singing as the girls in the audience screamed with excitement, reminding many of the similar reaction to Frank Sinatra at his concerts a decade earlier. Before 1960 Presley had 18 records each selling more than one million copies. Fan magazines turned to radio again, as it was the rock stars' major medium. Formula format continued with modifications as the mainstay of radio for many years.

The country and western boom came on the heels of rock 'n' roll popularity. After 1957, C & W records were heard on many stations, and C & W specialty stations began to appear in the Northeast, heretofore out of reach for country stars and songs whose "natural" audience was in the South and Midwest. Another type of music allied to both C & W and rock was the folk music of the Kingston Trio and similar well-rehearsed groups whose songs were musically enjoyable and had much less "bite" than the socially significant folksongs of the 1930s and before. By the late 1950s rock was being recycled, stations playing "oldies but goodies" or "golden oldies" several years after they left the Top 40 list.

8•62 *The Age of Television Entertainment*

In the 1950s as quiz shows and westerns filled evening prime time, sponsors produced fewer and fewer programs. As late as 1957, sponsors or advertising agencies still produced about one-third of the network shows, especially daytime programs, while networks produced another third. The remainder came from the *packagers*, companies that combined talent, production facilities, and ideas for specific programs or series under contract to a network. Typically, a packager developed or bought the program idea and, if the network was interested, produced a *pilot* or sample program. If the network and a potential sponsor were still interested, the packaging company would then produce series episodes. For each program, the packager would assemble talent, technical facilities—sometimes rented from the network—and personnel, so that the network would purchase a finished film or tape package. By 1960 these companies produced about 60 percent of television network programming, networks about 20 percent, chiefly news and documentaries, and sponsors about 14 percent. The packagers made much of their profit from syndication to individual stations of programs no longer aired on the network. Frequently, however, the networks acquired a financial interest in the programs produced by the packagers—a system that developed further in the 1960s.

Another important trend was the change from live to recorded programs. In 1953, 80 percent of the network shows were done live before television cameras at the time of televising so that any mistakes went out over the air—actors forgetting their lines, "dead" bodies getting up and walking off a scene, a stagehand walking outside a window that was sup-

posed to be 25 stories high. The remaining 20 percent of programs were on film, including a few kinescopes. By 1960, the VTR (see 8.12) had taken hold on the networks, and one-third of their programs were taped—a process even then so good that most viewers could not tell the difference between live and tape. Live network shows were down to 36 percent of the total—and continued to drop sharply in the early 1960s—with the remaining third being filmed. The kinescope virtually disappeared from network use.

Stations had used syndicated, filmed programming for their off-network hours from the beginning. At first it had consisted of some original material and old theatrical films. By 1955 a good part of syndicated offerings was off-network material—programs that had finished their first runs on the networks. But in 1960, after a short-lived attempt in 1957–1958, the networks began showing feature films, which were not available for syndication until the networks were finished with them. As a result, the stations expanded their network television schedules, typically from 48 percent to 61 percent, and reduced local live and syndicated film material, from 22 percent down to 11 percent for local live and from 14 percent to 13 percent for theatrical film available for station use.

That television made voracious use of program material was demonstrated by its rapid turnover. From 1955 to 1959, the networks averaged 46 new programs each season. Only about 20 of these returned for a second year, and many failed to make it through their first season. Such short runs were costly for networks and packagers. Furthermore, a program that had been in active production for less than a year was unattractive for syndication. Why some programs last and others do not never has been clearly understood, but in the mid-1950s observers suggested four

reasons: sponsor satisfaction, personality continuity of the host or characters, a low-pressure format, and familiar situations. Certainly another influence on program selection if not longevity was program cycles, for as soon as a format became popular, other networks or producers aired their own versions, rapidly satiating public interest until the format began to decline for lack of material and viewer following. The television *adult western* format (see below) is an excellent example.

Another trend was the gradual lengthening of programs. Whereas in the early years program directors had been concerned about holding interest for longer than 15 or 20 minutes, the half-hour show had become standard by the early 1950s. As the decade wore on, the hour-long program became prevalent, and 90- and even 120-minute special programs became almost common. Some program types, such as situation comedies, stayed with the half-hour period. The general trend was to lessen the lock-step progression of programs on all networks at the same hour. For instance, a very popular hour-long program might be scheduled so that its second half would overlap the start of a program on another network.

One of the most interesting developments of this period was the *spectacular*. Beginning in 1954, with the coming of limited colorcasting by NBC, the special or spectacular program made lavish use of settings and costumes, color, and major names to attract an audience from the humdrum of series formats, even though they often emphasized spectacle over content. As noted at the head of this chapter, one of the most important shows of this type was *Peter Pan*, telecast by NBC for two hours, live, in color, in early March 1955. Mary Martin's bravura performance was seen by nearly 70 million Americans, making it the largest audience for any sin-

gle event in history up to that time. Early specials marking major anniversaries of the Ford Motor Company or the electric light were telecast on two or three networks at a time. The specials were expensive to produce, and programmers at first were unsure of their possible effect on viewers used to regular programs in scheduled slots week after week. In the 1954–1955 season, there were only 41 hours of specials, but in 1959–1960 there were six times as many. NBC broadcast more of these programs than the other networks, thanks to the prodding of “Pat” Weaver; CBS was second, although similar in approach; and ABC seldom was in the running. Content varied from lavish variety specials to documentaries and drama, which usually appeared in inverse proportions—more drama, less documentary, and so on. All were intended for large audiences.

Another important program was NBC’s *Tonight* variety show, which began on September 27, 1954, with Steve Allen as host. This 90-minute agglomeration of talk, guests, music, sketches, and jokes began at 11:30 P.M. (ET) and took network programming into the wee hours of the morning. *Tonight*, with Jack Paar taking over as host in 1957, quickly attracted a following of night owls.

Straight musical programming consisted of former radio orchestral shows, including the semiclassical *Voice of Firestone* and the popular *Your Hit Parade* (see 7.61), and light music shows. The latter, generally 15-minute filler programs built around a single singer, faded from television after 1954 in favor of general variety shows. The rock music format came to television in 1957 with *American Bandstand* on ABC, hosted by Dick Clark for two hours late every afternoon. This program, begun in Philadelphia in 1952, became a nationally televised teenage dance party with guest

star visits. To save rehearsals and to give the audience the sound they were used to, the singers merely moved their lips in synchronization (*sync*) to a record. Youthful fans responded to the dancers and new dances as much as the music itself. Building on this program and his radio popularity, Clark built an interlocking, highly profitable empire of music publishers, production, and other companies. Many local stations had similar programs, which were relatively easy to produce, but they never had the impact of rock radio.

Four major kinds of drama dominated network television in the 1950s: daytime soap operas, general and anthology drama, situation comedy, and, at the end of the decade, adult westerns. The familiar housewife-pointed serial drama grew slowly after 1953, until it reached 20 hours a week by 1960. This increase came partly from extending the programs from 15 to 30 minutes in the middle of the 1950s and partly from new shows coming on the air. Prestige anthology drama flourished. During the 1953–1956 period it was at its height, with some 20 programs per week on the three networks. After 1958 such programs were presented as specials, comprising between one-quarter and one-third of all special programming. In either category, the shows usually ran an hour or longer, although there were a few half-hour programs in the 1950s; were presented live or, toward the end of the decade, on tape; used changing characters and actors in different stories; and presented adaptations as well as original plays.

Playhouse 90, started by CBS in fall 1956, probably typified the best of television anthology drama. This weekly, 90-minute, live, original drama series allowed optimal development of characterization and plot. Programs such as *Studio One*, *Kraft Theater*, and the *U.S. Steel Hour* had proven very successful as early as 1953.

Rod Serling's "Patterns," on the *Kraft Theater* program, had so much response that it was repeated, live, a few weeks later. It was later made into a movie, as were his "Requiem for a Heavyweight" and Paddy Chayefsky's low-key but warmly satisfying "Marty." For the first time people on the street talked about television theater—plays written by Chayefsky, Serling, Reginald Rose, and others, and produced and directed by people like John Frankenheimer, Delbert Mann, and Franklin Schaffner. These creative people, many of whom moved to the feature film industry in later years, understood the television medium and concentrated on images that would move from the small screen into the minds and emotions of the television audience. Some programs used major stars in substantial dramatic roles, but others used "unknown" actors, including many from radio drama, with great success. One program, dealing with the death of Stalin, precipitated an international incident and rebounded on Soviet attitudes toward network newsmen stationed in Moscow.

Naturally, with the pressure of weekly deadlines, the quality was uneven—something that is often overlooked in reviewing the "golden age" of television drama. Many programs were thoroughly panned by critics. Although new series aired—CBS's suspenseful *Climax* and shorter programs like *Death Valley Days* and the *Jane Wyman Theater*—rising costs and declining ratings reduced the anthology format to an occasional special.

A continuing staple through the 1950s was the half-hour situation comedy. Paced by the long-running Lucille Ball program under the title of *I Love Lucy* and other labels, this type peaked in 1954 and 1955 and then dropped with the onslaught of the western adventure show. But this drop may be misleading, for the televised situation comedy is one of the most long-

lasting formats ever devised for broadcasting. Though it fluctuates, it continues strong. Usually built on a "typical" but actually very atypical American family, it spawned subgenre such as the rural situation comedy, first successful with *The Real McCoys*.

Another situation comedy subgenre saw humor in confidence men. Robert Cummings appeared as a leering photographer surrounded by beautiful models, and hopelessly pursued by his eminently sensible but very plain assistant. This program, which ran for five years, was familiar to moviegoers who had seen Cummings play similar parts in films. Comic Phil Silvers created one of television's unique characters, Army Sergeant Ernie Bilko, in the last part of the 1950s. Sergeant Bilko ran rings around his camp commander, most of his men, and his noncommissioned colleagues but often got his comeuppance while trying to make money in slippery ways.

Another television staple that dwindles but never disappears is the crime-adventure-detective genre. The most successful of the television crime fighters of the 1950s was lawyer *Perry Mason* played by Raymond Burr, who brought the Erle Stanley Gardner character to life in 1958. In 1956 film director Alfred Hitchcock brought his suspense and macabre sense of humor to television. His half-hour thrillers with weird twists were famous almost more for the director's opening and closing monologues than for the dramas themselves. Crime à la Chicago's bootlegging days showed up on *The Untouchables*, with a machine-gun narration by gossip columnist Walter Winchell and a wonderful cast of old automobiles. Despite protests from Italian-Americans that all the villains appeared to be Italians, the program had high ratings for years. *Peter Gunn*, a series notable for its improvisa-

tional jazz theme and background, had a detective who, like most television heroes, usually won but often took a beating in the process. Running through the 1950s and, after a break, again in the late 1960s was the archetype *Dragnet*, created by and starring Jack Webb in a realistic account of police operations in Los Angeles. Another show with a California setting was *77 Sunset Strip*, which had a good theme, fast cars, Hollywood living, and a new idol for teenage girls, Edd “Kookie” Burns. It and other Warner Brothers productions, such as *Hawaiian Eye*, were so formula-written that, during a writers’ strike, they exchanged old scripts and merely changed the characters’ names. David Janssen, later to star in several other popular series, was *Richard Diamond, Private Eye*, whose telephone-answering service operator “Sam”—only her attractive legs were seen on the screen—was Mary Tyler Moore. Every television season most networks offered a couple of detective or police-related programs, usually in realistic half-hour formats.

In the late 1950s, the western became the most popular type of television series drama. There always had been westerns on television—even one produced live each day in a station backyard in Philadelphia—but like *The Lone Ranger* and other radio westerns, they were aimed at younger listeners. *Hopalong Cassidy*—originally a series of inexpensive movies—was tremendously popular among youngsters. *The Cisco Kid* and other westerns were major television syndication items. The *adult western*, with three-dimensional characters, arrived in fall 1955, with *Gunsmoke*, a former radio show, serving as the archetype. The four continuing characters—a frontier U.S. marshal, his assistant, the female saloon owner, and the grizzled doctor—anchored two decades of episodes that concentrated on

character and incident rather than on the old action-adventure, good versus bad, of children’s programs. Although the cast changed, *Gunsmoke* became one of television’s longest running programs. The growth in western-located programs was rapid: from six shows in 1955–1956 to 18 in 1957–1958 and 30 in 1959–1960, the year in which *Bonanza*, the second most successful western program, made its debut. This hour-long show was built around a ranch-owning patriarch played by Lorne Greene—formerly a top announcer for the Canadian Broadcasting Corporation—and his four, later three, sons. The episodes on the Ponderosa Ranch were to fill television screens for 14 seasons and then continue into endless years of syndication. Many other westerns did too, such as *Have Gun—Will Travel*, which set a high standard for acting, as its cultured gunman-hero, Richard Boone, roamed the West for hire. The overwhelming popularity of the western format was brief but some programs achieved ratings of more than 40, when a rating in the low 20s was considered good, for weeks at a time. The American West of the late 1800s had long been a major theme of the movies and printed fiction, and it fascinated television audiences steadily through the 1960s, although with diminishing popularity.

Most of Hollywood’s feature films were not available to television in the 1952–1960 period. Films made prior to 1948 often were syndicated to local stations, but most film producers and distributors kept the classics and post-1948 production away from television. Their reasons were economic. Films made after August 1948 were bound by a contractual requirement that performers be paid additional income for television showings. In addition, film producers were afraid that, if they sold their product to their chief competing medium, old films showing on local stations would

cut into the potential theater audience for new films or re-releases. The major producers held this front tenuously through the 1950s and then agreed to a common release date for most of their old productions, holding on only to classics and recent films still valuable for theatrical release. Thus in 1956–1957, thousands of Hollywood feature and short-subject films flooded into television, usually as “packages” of good and not-so-good films from a given studio. Why the sale in 1956 after years of holding off? Simply because Hollywood was hurting financially and needed the capital badly enough to cause the studios to sell their own heritage and ignore the potential disadvantages. Interestingly, in light of later events, feature films appeared in *network* schedules in 1956 and 1957 only in limited numbers, and did not return until the early 1960s. At the time, it still was economically more feasible for networks to prepare and present original material. The network also feared that theatrical films would not attract large audiences, since many people already had seen them.

A number of innovations were made in children’s programs, reducing reliance on *Hopalong Cassidy*. In 1956 CBS began a morning show for preschoolers, *Captain Kangaroo*—a mixture of songs, education, fun, and a bit of light philosophy. Bob Keeshan, who was actually in his thirties, played the easygoing elderly sea captain in such a way as to charm parents and children alike. Once in the late 1950s, when CBS contemplated taking *Captain Kangaroo* off the air, brief mention of these plans in the trade press and newspaper television columns brought thousands of letters from outraged parents, many of them connected with the broadcasting industry. CBS executive Hubbell Robinson promised that the program would remain. However, this outpouring of support attracted the pre-

viously missing advertisers to the point that many parents sighed for the days of fewer commercials and more program content. Most network programming for children consisted of action-adventure shows and cartoons presented in the late afternoon or on Saturday or Sunday morning. The ABC-Disney deal led to *Disneyland* for all ages and to the *Mickey Mouse Club*, which in 1956 practically owned the grade-school audience in the late afternoon. Soon the cast’s wearing of caps with Mickey Mouse ears caused a nationwide fad, and the show’s theme song became a camp hit among older children. The Disney organization again syndicated the original shows in the 1970s, long after many of the young performers had risen in show business or sunk to obscurity. The success of this revival led to a later—unsuccessful—version, featuring a cast that better reflected American cultural and ethnic diversity.

8•63 *The Quiz Shows: Success and Scandal*

Even more emphatically but more briefly than westerns, big money quiz shows grabbed the nation’s fancy. The *\$64,000 Question*, under the sponsorship of Revlon cosmetics, began on CBS on June 7, 1955, and within a month was the most popular program on the air, with a Nielsen rating of 41.1. It was based on an old radio quiz program that doubled the ante as the contestant answered each succeeding question, up to \$64. The *\$64,000 Question* was a triumph of psychological appeal—vast sums of money—and format, with quickly famous isolation booths, bank-guarded questions developed by a team of university researchers, and participants in everyday occupations who apparently often had expert knowledge in unlikely

fields. So the nation saw a Marine captain who was a cooking expert, a grandmother fascinated with baseball statistics, a woman psychologist knowledgeable about boxing (Dr. Joyce Brothers, who had deliberately memorized boxing data to get on the show, and who later had her own broadcast advice program), a shoemaker who knew grand opera, and a ten-year-old math whiz. The show's producers received 15,000–20,000 applications a week, and cut that number to about 500 "possibles." Of those they actively considered half, but selected only about 15 each week. Louis Cowan, whose organization developed the idea for the program, became a high CBS executive. The \$64,000 *Question* became so popular that it was followed by the \$64,000 *Chal-*

lenge, where winners from the first show were challenged by other contestants. At one point *Question* and *Challenge* were one-two in the ratings, and Revlon had to change its advertising because it had run out of product!

These programs were soon followed by *Twenty-One*, in which harder questions received more points and it took 21 to win a match; *Dotto*, trying quickly to identify a face that gradually emerged as dots were slowly connected; and others in both evening and daytime hours. The prize money made weekly headlines. Several contestants won more than \$100,000, and even the losers earned a new Cadillac as consolation.

But this success did not continue.

TV's Isolation Booth Era / The format was fairly similar on all the big money quiz shows before the end came, in a blaze of cheating and scandal—curtains, the sponsor's name in evidence, the ubiquitous isolation booths presumably precluding hanky-panky for the competitors, and the velvet-chained stands for the contestants before the questions were asked. This shot is from \$64,000 *Challenge*, the program for successful contestants from \$64,000 *Question*. Photo credit: Indelible, Inc.



By late 1957 and early 1958, ratings were falling off and some newer shows aired only briefly. It was difficult to maintain a fever pitch of interest among viewers. But much more serious were the mutterings from various quarters that the shows had been rigged—an accusation that program producers and contestants vigorously denied. But the denials were false and the dam had to break: too many people knew what was going on. The first news of something seriously wrong came in August 1958 when *Dotto* was abruptly canceled from its CBS morning slot and its NBC evening position. Several contestants had claimed that the program had been rigged, and one had written to the FCC. Within days, some 20 quiz programs left the air in television's first major programming scandal. Network officials claimed ignorance of rigging, program producers said that people did not understand commercial television's purposes and practices, and advertisers said nothing. In 1959 a New York grand jury investigated the matter, but its final report in July was not made public. Responsibility for investigation—which the public demanded, particularly after popular winner Charles Van Doren had admitted complicity in cheating on *Twenty-One*—then devolved on Congress and the FCC. The shock waves that went through the industry as a result of the quiz show and payola scandals made many persons wonder about the merits of the high pressure and stakes of broadcasting and especially of the demand for high ratings to please advertisers (see 8.84).

8•64 *Development of Television Journalism*

News programming on most television stations and networks changed little during this period. The networks each of-

fered a 15-minute early evening roundup, which by the late 1950s contained more network reporting and newsfilm shooting than the simple newsreel of the early 1950s. NBC ended John Cameron Swayze's news anchor job in 1956, replacing him with a team of reporters first assembled for reporting the 1956 elections (see 8.65), Chet Huntley and David Brinkley, both experienced broadcast journalists. Douglas Edwards continued to hold down the CBS evening news, and John Daly anchored the ABC program. Local stations usually scheduled a half-hour of news, weather, and sports—often in the form of three ten-minute programs—prior to the network news and then offered a recap at the end of network programming at 11 P.M.—10 P.M. in the midwestern and mountain states. This format did not change until 1963, when the CBS and NBC programs were lengthened to a half-hour (see 9.64).

Supplementing the regular network news programs were many special events. There is space here for only some of the highlights. The June 1953 coverage of Queen Elizabeth II's coronation in London was a technical tour-de-force. The time differential of six hours between London and New York, the transatlantic distance, and the desire of people in North America to see what transpired as soon as possible offered interesting problems. The time differential and the need to transport film actually helped, for what happened in London up to 1 P.M. would have shown up in the United States too early for viewing if direct electronic transmission of video signals across the Atlantic had been available. Still photographs transmitted from London by wirephoto were telecast in New York within ten minutes of being taken. But film coverage of the day's events, photographed mostly by the BBC, or taken from their television coverage, was carried by special airplane flights to the nearest

North American cities on the network lines and fed into the vigorously competing commercial networks and into Canada's CBC. By late afternoon and evening of Coronation Day, Americans were seeing the events, within 12 hours of their occurrence. The television networks also moved rapidly to cover President Eisenhower's illnesses in 1955 and 1956. The Suez fighting and Hungarian uprising of late 1956, coming toward the windup of an American political campaign, tested television news, which attempted to cover complicated events in three areas at once. In 1959, Soviet leader Nikita Khrushchev visited the United States for several days and was followed by a mob of reporters. The televised scenes of Khrushchev banging

his shoe on a desk at the United Nations gave a peculiar image of international politics. Television also covered the rise of Fidel Castro in Cuba, from early network specials on the rebels in the Sierra Maestra in 1957–1958 to lavish coverage of Castro's 1959 triumph and takeover. For the most part such news events were carried on regular newscasts rather than as specials.

8•65 *Political Broadcasting*

The exception was, of course, politics. The era saw three major political events: the Army-McCarthy Hearings in 1954, and the 1956 and 1960 election campaigns. In addition, the presidency came

A Pioneering TV Documentary Team / Top CBS reporter Edward R. Murrow (left) teamed up in the late 1940s with producer Fred Friendly (right) to do a series of radio and record documentaries. In 1951, the two created *See It Now* as the first continuing television documentary series—best remembered for the attack on Senator McCarthy discussed in the text. Friendly later headed CBS news. Photo courtesy of Edwin Ginn Library, Tufts University.



a bit closer to the people when President Truman in 1951 permitted excerpts from recordings of presidential news conferences to be aired, and President Eisenhower in 1953 allowed filming, and later videotaping, of news conferences for delayed, censored broadcast. Before, reporters could only paraphrase, and later quote, the President's remarks from stenographic, and later recorded, transcripts.

Joseph McCarthy (R-Wisconsin) was riding high in 1953 when he began an investigation of communism in the U.S. Army. Due to a number of events too involved to relate here, this culminated in a series of televised hearings before McCarthy's investigative subcommittee from late April to early June 1954. For television, it was the most important long-term live reporting since the Kefauver crime hearings of 1951 (see 7.64). But shortly before the hearings started, on March 9, 1954, CBS newsman Edward R. Murrow had used one of his weekly half-hour *See It Now* broadcasts to expose the senator's vicious tactics—and did it by showing films of the senator's own speeches. Keeping in mind the political mood and the usual lack of aggressive investigative reporting or commentary on television, the broadcast took considerable courage, as well as some of Murrow's and program producer Fred Friendly's money. They advertised it in selected newspapers because the network was worried about any controversy and particularly controversy of this sort. The program together with a later one created a storm of reaction, with thousands of calls and letters, most of them favorable to Murrow's stand. A short time later, when McCarthy was given the chance to respond, he used the time to attack Murrow.

These broadcasts roused interest in the Army-McCarthy hearings that followed. For nearly eight weeks, the networks, particularly ABC, which had the

least revenue to lose, scrapped morning programs to carry all or part of the hearings and, to their surprise, saw daytime ratings increase by 50 percent. Soon all viewers became familiar with the pounding questioning by McCarthy and his chief aide, Roy Cohn, and the gentlemanly effective cross-examination by Army counsel Joseph Welsh, who, over the weeks, revealed McCarthy as a bully who played with facts, people's reputations, and important issues for his own political gain. Much of the American public turned from McCarthy in disgust, and he soon faded from prominence, after being censured by the Senate. To a great degree, television had destroyed McCarthy's public esteem merely by showing intensively what happened—even though television's regular news programs had helped build him up. One unfortunate lasting effect of the McCarthy hearings coverage was identification, in the public mind, of the Constitutional right of "taking the Fifth Amendment" with guilt.

The 1956 presidential race was something of a replay of the 1952 campaign, with the same candidates but a more important role for television. For one thing, there were now four times as many television stations and twice as many home receivers. Second, as President Eisenhower had been seriously ill, television was used as the primary means of getting his image and message to the people. This saved his strength and let him concentrate more on the Suez and Hungarian crises. There was a greater use of five-minute programs at the end of shortened popular entertainment programs, rather than the half-hour political broadcasts of 1952, which alienated many viewers whose favorite shows had been pre-empted. That television had become of primary importance in broadcast political campaigning, reporting, and advertising was shown by

television political revenues surpassing radio's for the first time.

The 1960 campaign featured two very different men and two quite different approaches to television. John F. Kennedy brought a relaxed, modern style to television, born of his need to overcome the handicap of being a member of a wealthy Catholic family not well known to the national public. Vice President Richard Nixon often ignored ideas of his television advisers, apparently feeling that his 1952 "Checkers" speech had proved his television skill.

The highlight of the campaign was four "Great Debates," the first such face-to-face confrontation of candidates for presidential office. In summer 1960, Con-

gress had suspended for that campaign only Section 315 of the Communications Act, requiring that candidates for a given political office be given equal opportunity to use broadcasting facilities, with respect to the races for president and vice president. Relieved of the "equal time" obligation to fringe candidates, the three major networks offered, and the Nixon and Kennedy camps accepted, time for four or five debates. The first, televised live on September 26 on all three networks, may have cost Richard Nixon the election. He looked haggard, owing partly to a light suit against a light background and also to a tired and furtive look he seemed to have on television—partly due to an unwillingness to take network technicians' advice on

The "Great Debates" of 1960 / The four debates between Vice President Richard M. Nixon and Senator John F. Kennedy in the fall of 1960 probably decided the election—for in the first debate Nixon came across as gray (in several ways) and evasive compared to the crisp Kennedy style. In part because incumbents dislike giving exposure to challengers, the next national television debates were not held until President Ford and Governor Carter met in 1976. Photos courtesy of State Historical Society of Wisconsin and the *Milwaukee Journal*.



makeup—while Kennedy appeared confident and outgoing. Interestingly enough, listeners on radio thought that the candidates were about even or that Nixon did better. But more persons saw the program than heard it, and Kennedy got exposure he could not have got in any other way. Nixon, who had been leading in public opinion polls, lost much of his carefully cultivated aura of experience and leadership. Nixon fared somewhat better in the three subsequent debates in October, with varied formats, but the damage had been done. Plans for a fifth debate fell through at the last minute, and both candidates relied instead on election eve *telethons* from their respective headquarters. Some historians believe that the debates provided the less well-known Kennedy with the narrow margin by which he won in November. On election night, the networks introduced the use of computers to predict winners. They flopped. Early in the evening, CBS predicted a Nixon landslide victory about the time NBC was saying that Kennedy would take the election by a wide margin. Only early the following morning did the true thin margin of the Kennedy victory become clear.

8•7 Viewing Trends and Research

As in every period discussed thus far, the broadcast audience increased in the 1950s. The proportion of homes with television sets rose from just over one-third in 1953 to nearly 90 percent by 1960—a truly phenomenal increase. The radio audience also grew, with even FM receivers selling well by the end of the decade. But as audiences increased so did concern about the effects of broadcasting, especially about the effects of television program content on young viewers.

8•71 Cheaper Receivers—and More of Them

AM radios in the 1950s were smaller than earlier sets and, in the latter part of the decade, truly portable. People still bought console radio-phonograph combinations, but the volume market in radio was in table, clock, portable (with batteries), and other smaller-size sets for every room of the house. Plastic cases and tube sets were the rule; transistor portable radios—lightweight and using inexpensive batteries—did not appear until the cost of transistors lowered in the last half of the decade. The typical home radio sold for \$20 to \$30, and the typical purchaser was a radio owner who wanted an extra set. In another potential audience area of AM radio, the proportion of automobiles with radios increased in these eight years from 55 percent to 68 percent.

For most of the decade, the FM receiver market remained low and stagnant. Each year from 1953 through 1958, no more than 700,000 sets were sold; for four of these years, fewer than 300,000. At the same time, 10–15 million AM radios and 5–7 million much more expensive television sets were sold each year. The least expensive FM receiver sold for about \$50, more than double the price of a typical AM set, and distribution of FM sales and service outlets was inadequate. Then, in late 1958 and 1959, for the first time in eight years, more than one million FM receivers were sold. In 1960, nearly two million FM receivers were sold, about 10 percent of them imports from Germany and Japan, where war-devastated electronics industries had been rebuilt into advanced-technology, highly efficient operations. The average FM-AM set price came down to about \$30, only \$10 to \$15 above the cost of an AM-only radio. The use of transistors and circuit innovations that prevented

frequency “drift” as sets warmed up made FM receivers far more attractive. Other reasons for the growth of FM broadcasting have been discussed above (see 8.21), but public awareness and advertising of sets helped a great deal.

Television continued to absorb the most attention and the most money. In 1952–1953, the typical set had a 12-inch, 14-inch, or 16-inch screen and cost about \$250 plus installation. When you could buy a 21-inch set, it cost more than \$400. Virtually all sets were American-made and black-and-white; only 500,000 color sets were manufactured between 1953 and 1960, as contrasted to more than 52 million monochrome sets. While volume production continued to lower prices, it took the arrival of small portables in 1956 to bring the cost of a television set to less than \$100. Television expanded across the country: 45 percent of U.S. homes had sets in 1953, although many markets in the Northeast had more than 80 percent set saturation, and some in the South had only a scattering. By 1960, however, regional variations had evened out considerably: the northern states were running about 90 percent and the southern states less, but the national average was 87 percent. But, even in 1960, less than 75 percent of homes in isolated rural areas had television, due to receiver cost and distance from transmitters.

The television market was influenced by two post-1952 developments. The first was the establishment of UHF stations, bringing about a need for UHF reception capability. Some receivers offered both VHF and UHF tuners built in, but the number of such sets declined annually from 1.4 million in 1954 to 400,000 in 1958—a small fraction of the 6–7 million sets sold yearly. Set manufacturers claimed that there was insufficient demand for the more complicated and \$10 to \$30 more expensive all-channel sets, while UHF operators

and some potential viewers countercomplained that the manufacturers wanted to concentrate on the more lucrative VHF market. The only way to get UHF reception in a receiver built without UHF tuning was to purchase an externally mounted converter costing \$30 to \$50. The converter did not sell well; its quality was uneven, usually no better than “fair,” and it could cause interference to other sets on the same or different channels. The limited sale of UHF reception equipment increased the inequality between stations on the two television bands and placed further pressure on the FCC or Congress to relieve it (see 8.81).

The other new element in television, color, took hold slowly for technical and economic reasons. Color adjustment on early sets was very difficult, with blue faces and green lips particularly common; color programming was scarce; and color sets cost at least \$800 for a number of years. The first 1953–1954 color sets had 12-inch to 14-inch screens, and at \$1,000 it is not surprising that only 5,000 were sold. But as the sets improved and as color programming on the networks, mainly NBC, increased, so did interest in color receivers, sparked by the enthusiastic reviews of color programs by newspaper television columnists. Between 1956 and 1960, from 80,000 to 120,000 color sets were sold each year, and prices crept downward into the \$500–\$800 range. RCA built 90 percent of color sets made. By late 1959, less than 1 percent of American homes had color. As these households relegated the old black-and-white set to stand-by or bedroom service, and as others bought newer black-and-white receivers, television homes with more than one set rose to 10 percent. To stimulate set sales, color programming rose from 68 hours in 1954 to nearly 700 hours in 1959. Most was on NBC; in 1959 CBS offered only 6½ hours

of color and financially pressed ABC offered none and said that it had no plans for color. Obviously, NBC's color programming was tied to parent RCA's manufacturing role, and CBS saw no reason, after the torpedoing of its own color plans earlier in the decade (see 7.821), to put money in RCA's pocket. Color was only an expensive toy for a small minority. The pundits who claimed that color television would "make it big this year" constantly had to backtrack.

8•72 *Broadcast Viewing and Listening Trends*

By the late 1950s, the A.C. Nielsen company clearly dominated the national television rating field despite competition from the American Research Bureau (ARB, now Arbitron), its closest rival, The Pulse, Trendex, and others. The Nielsen meter, placed in a sample of 1,200 homes across the nation, provided the audience data often responsible for changing network programs from season to season. In addition to regular ratings reports sent to customers, Nielsen published related research showing that by 1960 the average television household had the set on for roughly six hours a day. Most daytime viewing was done by *heavy viewers*, households that used the set for 10 or more hours a day.

The methods of testing audience preferences and habits had been weighed since the early 1930s. ARB depended on listener diaries, little booklets in which test families, changed for each *sweep*, kept track of their viewing and some demographic factors. In the 1950s, Trendex tried to revive the system of coincidental telephone calls for given programs rather than for all shows on the air, but advertiser and agency interest was insufficient to support this expensive service. Its main appeal was

overnight readings on specific programs, so that decision-makers would not have to wait two weeks or more to act on a special program or a show in trouble. In 1958 ARB borrowed Nielsen's meter idea but tied a small sample by telephone line to a central processing computer to derive overnight "Arbitron" ratings for New York. Again, expense limited this operation. All methods had drawbacks: the diary suffered from errors and nonresponses; the meter measured tuning rather than viewing.

An important development in the 1950s was the increasing demand by advertising agencies for demographic information. Knowing that a large number of people had looked at a given show was no longer enough. Advertisers wanted to know the ages and sex of viewers, their income, and other factors believed crucial to product sales decisions. The Home Testing Institute made the first attempt to supply these figures with its "TVQ" or "Television Quotient" service, and other market research organizations, including the rating services, attempted to provide similar information, adding to the higher costs of the stations and networks. One can argue that this was a sign of what some social scientists later called the decline of the *mass* media concept. For now, instead of focusing on a maximum size undifferentiated audience, advertisers sought a specific audience for specific products or services. The result was a series of programs and supporting advertisements aimed carefully at a specific mini-audience and not at a mass one. This trend was to continue.

The ratings services fell into public disfavor as a result of the quiz show scandals, although it did not stop their use. For the loss of favorite programs the public blamed the ratings services rather than the decision-makers who used the data the services provided, and now the quiz show

situation added a moral dimension. Time and again in subsequent regulatory proceedings (see 8.84), the argument was raised that the need for high ratings had caused the quiz show deceptions. Growing concern about the derivation, validity, reliability, and role of ratings led in the 1960s to major congressional and industry investigations of methods used.

Amidst the television hoopla, radio was overshadowed but not forgotten. The first in-depth look at radio in more than five years, widely reported in the trade press, was a 1953 Politz study. It showed that, while the *pattern* of radio listening had changed with the coming of television, the increase of radio listening in cars, in daytime, and away from the home had stayed high.

8·73 *Children and Television: Phase One*

From the start, families with children were among the first to buy television sets—at the urging of the children. Television became a natural babysitter, freeing parents and older children. Parents soon learned what researchers later found out: children as young as three were regular and heavy users of television. Parents worried that their children might be getting ideas from television that they were ill-equipped to handle—first apparent in the child's loud urging to buy some television-advertised product. A more serious concern was the constant action and violence seen on many cartoon shows, slapstick comedies such as *The Three Stooges*, and westerns aired when young children could see them. The number of fights, shootings, and killings broadcast in any week made viewers wonder what young children were learning. This concern had been expressed to some degree over radio

and motion pictures in the 1930s and 1940s, and over comic books later, but people had worried then about radio's overtaking the child's imagination. Now, they feared that *any* child, of any age, seeing mayhem on television day after day would become desensitized and accustomed to this behavior, even to the extent of adopting such values in his or her own life.

This concern led Senator Estes Kefauver (D-Tennessee) to hold hearings in 1952 into the causes of juvenile delinquency. The hearings touched often on the potential lessons to be found in daily television fare. The same committee looked into the problem again in 1954–1955, when witnesses cited examples of behavior models shown in adult action-adventure programs often watched by children. They associated the child's habit of imitating older people with the opportunity for young television viewers to follow violent examples. Some experts' testimony at the hearings suggested, however, that televised violence might be good for children as catharsis, which implies that *watching* violence takes away the need for *doing* violence. Most observers and researchers disagreed—and continued to disagree (see 9.72)—with one another.

The first two in-depth research studies on the interaction of children and television appeared in the late 1950s. The first, by Himmelweit, Oppenheim, and Vince (1958), was based on observations and interviews of several thousand children in England, while the second, by Schramm, Lyle, and Parker (1961), reported results of research in ten American cities during the 1958–1960 period. The chief finding of both studies was something parents long had known: that from its arrival in the home, television dominated other media and family activities. Its great novelty appeal lasted a few weeks and then, like another toy, it became part

of the child's daily input. No physical effects showed up, although parents had worried about posture and eyesight in the early years of television, and about an increase in passivity—the *narcotizing dysfunction* of the mass media. The effect of television on school progress varied so much from child to child that generalizations were hard to make. The medium seemed to open children's eyes to the adult world faster, and in many youngsters sparked great interest in new things, but others simply sat in front of the set for hours, looking at whatever was on the tube. The determining factor seemed to be not the television set or its content but the background and emotional or psychological makeup of the child before he or she ever saw television. Both studies showed that sixth-grade children, about eleven years old, watched television the most—about four hours a day.

8•8 Crises of Regulatory Confidence

More than at any time since the Cox-Lea investigations during World War II (see 6.86), the regulatory picture was filled with investigations, soul-searching, and a feeling of smashed standards in broadcast content and operation. Members of the FCC testified on Capitol Hill more than they minded their own shop. One possible explanation for the events of 1952–1960 discussed below is that mistakes of the first decade of television had to be shaken out to make way for a fresh approach. That certainly happened!

8•81 *The UHF Mess*

Throughout this chapter we have mentioned the plight of UHF stations.

When the FCC issued the *Sixth Report and Order* in April 1952, it did not create the competition it claimed to desire (see 7.83). At best, the commission could create conditions and facilities for competition, hoping that new broadcasters would provide the competition and service to the public. However, the FCC established *unequal conditions*, which necessarily meant unequal competition. As the first UHF stations went on the air, they discovered that the stated FCC policy of equality of facilities in a given market did not exist in practice.

When UHF stations had to compete with VHF stations in the same market—a condition called *intermixture*—they were in trouble, particularly if the VHF station or stations had been operating for some time. In addition to the preponderance of VHF-only sets in such communities, the viewing habits of the audience, and the network affiliation contracts with pre-Freeze stations, a UHF operator had to neutralize or overcome the greater coverage area or range of VHF transmission. Both networks and advertisers relied on the concept of unduplicated population coverage or “circulation” in awarding affiliations and contracts. This basic inequality was aggravated by FCC moves to permit many VHF stations to increase antenna height and power, at a stage when the transmitter manufacturers were unable to construct high-powered UHF transmitters. Also, despite promises by receiver manufacturers to the contrary, only a small proportion of television receivers was able to pick up any UHF channels (see 8.71); all-channel set production peaked at 35 percent in the first half of 1953 and dropped below 9 percent by 1958, although field conversions raised the total proportion of UHF-capable receivers to more than one-fifth.

The FCC was too busy processing

applications and issuing construction permits to worry about UHF operators for some years. Congress made it clear that the FCC's first priority was to meet the needs of television-hungry constituents. Surviving UHF operators lived on hope alone. The seriousness of their plight was indicated by the nearly 55 percent of the 165 UHF stations that went on the air between mid-1952 and mid-1959 later going dark. The high point of 127 UHF stations came in March 1954; five years later there were fewer than 80.

The FCC's hope—or, in light of the commission's penchant for ignoring engineering advice, fantasy—that UHF and VHF were equal was not immediately obvious from the *Sixth Report and Order*. Of the 1,275 communities to which channels were assigned, 110 were to be VHF only, 910 UHF only, and only 255 (20 percent) intermixed. Also not immediately apparent from the *Sixth Report and Order* was the fact that of the top 162 markets 8 were to be VHF only, 31 UHF only, and 123 (76 percent) intermixed. Considering the cost of establishing even the smallest station, it is no wonder that only 308 communities out of 1,275 had stations in operation in June 1958, and that virtually no UHF station was doing well against entrenched competition in the larger markets.

The loud complaints of UHF operators against the manufacturers, advertisers, networks, competition, and commission were to a large extent justified. Manufacturers were not interested in designing better all-channel sets or in promoting them, although their argument that there was little demand for UHF sets has pragmatic merit. Advertisers went where the people were, and VHF operators could hardly be expected to nurture their competition. The networks gave lip service to UHF but tended to give affiliations to VHF stations. Each established a plan—CBS's

“Extended Market Plan” and NBC's “Program Service Plan”—to provide network programs to some isolated UHF stations at practically no cost. This would give advertisers a few thousand more viewers and help the station sell spots before and after the network programs. After the FCC declared new multiple-ownership rules in fall 1954, allowing a single entity to hold five VHF and two UHF stations at the same time, both NBC and CBS bought two UHF stations apiece. Two were in the Hartford area and the others were in Milwaukee (CBS) and Buffalo (NBC), but all had been sold by early 1959 (see box on page 266).

The predicament of UHF stations stemmed mainly from three problems: (1) the technical inequality of UHF stations with respect to coverage, (2) intermixture, and the vast inertia of millions of VHF-only receivers, and (3) lack of confidence in the capabilities of and need for UHF television. None of these would easily yield to wishful thinking, persuasion, or the market place.

It was recognized fairly early that solutions to these problems might lie in one or a combination of (1) deintermixture, or unscrambling the egg so that each community would be *either* VHF *or* UHF; (2) converting to an all-UHF system, which would make all stations equal but would be very expensive for existing VHF stations and would reduce the number of signals that rural areas could pick up; (3) converting to an all-VHF system, discarding the UHF band for television and picking up a probably limited number of channels from FM or government; (4) promoting the manufacture and sale of all-channel sets by removing excise taxes or—in an analogy found in the Wireless Ship Act of 1910 (see 2.4)—forbidding the transport of VHF-only receivers in interstate commerce; (5) making unspecified but major changes in

the relationships between networks and affiliates; or (6) somehow reducing the coverage of VHF stations so that they would be comparable to UHF. Another industry-staffed engineering group, the Television Allocation Study Organization (TASO), was established under FCC auspices to study technical ramifications of these and similar proposals—an act that delayed FCC decisions for another few years. Meanwhile, 75 percent of UHF stations showed losses.

Some of the proposals would not provide sufficient help and some were politically or technically infeasible. Neither FM broadcasting, which was starting to grow again (see 8.21), nor the military, who were asked several times up through 1958, was willing to give up VHF spectrum space. UHF operators, although many had little confidence and staying power, saw no advantage in abandoning their toehold in the television industry. Broadcasters and the commission supported the idea of all-channel sets but recognized that any addition to consumer costs would be unpopular with Congress. Since range was affected more by antenna height than by power at these frequencies, reducing VHF power would seem to be ineffective, and allowing UHF stations to go to 5 million watts would not necessarily give a farther-reaching signal—if a transmitter could be made to deliver that power, and anyone could afford to buy it.

Because the UHF situation became caught up in the larger and politically more urgent issue of getting television to small communities, it received more and more congressional attention. At this time, before the Supreme Court “one man—one vote” decisions, rural areas and small communities had disproportionate political clout and representation in Congress. As a result, political rather than technological factors often ruled FCC decisions,

and indecision, in respect to CATV; then-illegal on-channel *boosters*, which retransmitted, causing considerable interference, on the same channel as the original signal; translators, which picked up a signal and retransmitted it on a high-UHF channel in a small community; and satellites, essentially regular stations that originated no programming (see 7.823).

The FCC, under considerable pressure from Senator Charles Potter’s (R-Michigan) Communications Subcommittee of the Senate Commerce Committee and recognizing the political pressures and the unlikelihood of a radical solution, started a series of hearings in 1955. It grasped at every straw, including the possibility of obtaining military spectrum space, “drop-in” of VHF channels without doing violence to the mileage-separation standards set forth in the *Sixth Report and Order*, and selective or total deintermixture.

The hearings gave UHF backers a platform from which to operate, and they tried to make the most of it; moving all television to the UHF band, limiting color to UHF, adding channels—all were proposed. They gave deintermixture limited support as a compromise but applauded removal of excise taxes on all-channel receivers. Although VHF operators, aided perhaps overly much by the NARTB, gave their views and the networks, led by CBS, indicated their lukewarm approval of UHF, the hearings bogged down in politics.

As with most political decisions, what emerged after FCC hearings in 1955, 1956, and 1958 was a compromise: selective—that is, in as few communities as possible—deintermixture in markets where it could be achieved without disrupting many existing stations and their audiences. Although a few markets were successfully deintermixed in the late 1950s, particularly in California’s San Joaquin Valley, the UHF situation sat on almost

dead center until the mid-1960s. The TASO final report advocated that the UHF be abandoned and television stick with a degraded, due to drop-ins, VHF system. In February 1959, shortly after the TASO report, the commission proposed several alternatives for further study, coordination, and discussion: (1) a 50-channel VHF system, retaining the present 12 VHF channels, (2) a continuous 50-channel VHF system, abandoning channels 2–6 but moving farther in the spectrum above channel 13, (3) a contiguous 25-channel VHF system retaining channels 7–13, (4) the present 82-channel VHF-UHF system, and (5) a 70-channel all-UHF system. These proposals needed further study, and each had its proponents among the commissioners. Although deintermixture and slight degradations of the VHF spectrum were believed to be practical and acceptable, the FCC said that they would not solve the problem.

The FCC requested and received \$2 million to test UHF propagation characteristics—especially in large cities—about which there were much disagreement and little data. Using for the study the channel assigned to New York’s Municipal Broadcasting System station WNYC-TV (which managed to have the test transmitter donated to it at the conclusion of the experiment some years later), the commission prodded dormant UHF construction permit holders, and waited noisily for Congress to agree on the best course. Senator Potter’s investigation had merged into a study of network operations by Senator John Bricker (R-Ohio) and, after the Democrats took over the Senate Commerce Committee in 1955, by Senator Warren Magnuson (D-Washington). Magnuson, who was very interested in television policy, covered a tremendous amount of ground, in the course of his Television Inquiry of 1956–1958 (see 8.83). Congress

made most of the FCC’s policy decisions, and until members of Congress and their constituents resolved their conflicting viewpoints, it was improbable that any commission decision in the UHF area would stick. More than a decade went by from the end of the Freeze to the first real legislative action—and the UHF was still a troublesome issue more than a decade after that (see 9.22).

8•82 *The FCC Investigates the Networks—Again*

In fall 1955, somewhat in response to Senator Bricker, the FCC decided that, because of the many changes in broadcasting, it was time for another look at the roles and practices of networks. Although the investigation was announced as covering both radio and television, money and staff limitations and recognition of the reduced role of radio networks allowed it to concentrate on television. Under the direction of University of Cincinnati Law School Dean Roscoe Barrow, extensive research was conducted in and about the networks—network-affiliate relations, option time, program sources, network ownership of stations, advertising revenues. The first report, issued in October 1957, provided a detailed review of commercial television and the organization and economic status of the major networks, with a brief chapter on the radio industry. It also provided recommendations that shook the industry.

Most important, the Barrow report urged that the networks be put under direct FCC regulation. The long-standing FCC regulation of network-owned or affiliated stations was considered insufficient for the complicated role and importance of television networks, which dominated television far more than radio

networks had dominated radio. In addition, the report recommended: (1) a ban on option time—specific times during the day when by contract the network had priority on station time; (2) limits on network ownership of stations; (3) a ban on *must-buy* stations—a technique that required an advertiser to pick his lineup of stations so that a minimal nationwide network identity would be preserved at all times; (4) publication of affiliation agreements; (5) a right of nonaffiliates to obtain network programs when the local affiliate rejects the network feed, and (6) penalties such as fines and forfeitures for breaking these or other rules. While the industry immediately complained that such rules would destroy the structure of broadcasting—a familiar lament (see 5.83)—the FCC took these initial recommendations under advisement.

In June 1960, the network study staff issued its second report, focusing on network program procurement. Described as an interim report, it covered months of FCC hearings with testimony from broadcasters, producers, critics, and others. It described current network practices in getting and using programming, including standards for program development and acceptance. It made some very tentative conclusions about public service programming, with the promise—but to date no delivery—of a more definitive report on programming in the near future.

This examination of networks was unlike the 1939–1941 investigation in several ways. For one thing, none of its recommendations promised changes as fundamental as the chain broadcasting rules upheld by the Supreme Court in 1943. Second, it was far more intensive and exhaustive than the 1941 Chain Broadcasting Report, yet it dealt with but a decade of television network operation. Finally, the 1957 report was the first in a series pre-

pared by a regular, not *ad hoc*, part of the commission staff, showing that the networks could expect continuing scrutiny.

However, the two investigations were also alike. Both came up with specific recommendations to temper business practices that appeared to restrain competition. Both were undertaken under congressional pressure, for the 1957 network study grew out of several years of House and Senate hearings on networks and the FCC. In both cases the final rule changes instituted by the FCC stuck, despite strong industry opposition (see 5.83 and 9.3).

8•83 . . . and Congress
Investigates the FCC—
Again

In March 1957 the House Committee on Interstate and Foreign Commerce formed a Subcommittee on Legislative Oversight to look into problems of certain regulatory agencies, which this committee was to “oversee” or supervise. The subcommittee was chaired at first by Congressman Morgan Moulder (D-Missouri) and later by full committee chairman Oren Harris (D-Arkansas). Almost from the start, the FCC became a prime target for the subcommittee chief counsel, New York University law professor Bernard Schwartz. Schwartz had little patience for diplomatic convention and made a habit of leaking to the press his latest findings on real and imagined shortcomings of the FCC. Those leaks led to Schwartz’s firing in January 1958. He promptly wrote a book charging a political cover-up of regulatory commission shenanigans. In spring 1958 the committee began hearings into the qualifications and activities of FCC commissioners, concentrating on their use of free industry-pro-

vided television sets and travel and on their *ex parte* (outside the normal forum for adjudication) contacts.

On March 3, 1958, FCC Commissioner Richard Mack resigned under fire, after it became known that he had accepted a sizable bribe to vote for an applicant for a Miami television channel. Mack was the first commissioner forced from office but not the last. Congress, concerned about chumminess between segments of the broadcasting industry and its regulators, focused on the Mack case. In April 1958 the subcommittee issued its report, calling for a code of ethics for administrative agency personnel, and the right of the President to remove commissioners for neglect of duty.

The subcommittee also investigated fairness in comparative application cases and the possible need for antitrust action against some broadcast owners. During the summer and fall of 1958, hearings continued into *ex parte* contacts, trafficking in licenses, mergers, and pay-offs—all actions considered to be not in the public interest. The quiz show scandals and the payola problem (see 8.84) took up most of the subcommittee's time in 1959 and 1960. A 1959 Attorney General report to the President called for legislation to strengthen and clean up the operations of the FCC and the FTC, and also dealt with the ethics of commissioners and staff members. This aspect received more attention just a few months later.

Early in 1960, pressure built up to get rid of FCC Chairman John C. Doerfer. He had used very poor judgment, especially in light of the ongoing investigations, had taken pleasure trips on a broadcaster's yacht, and had submitted double and triple billing for official trips. When he took yet another trip on group station owner George B. Storer's yacht, President Eisenhower asked for his resignation.

Doerfer was dissuaded from going on television with his side of the story, and resigned. The black eye on the regulator, the FCC, naturally eased congressional pressure on the regulated, the broadcasters.

Early in 1961 the Subcommittee on Legislative Oversight ended its activities before the hearings resorted to personality battles or vendettas like the Cox investigation of the early 1940s (see 6.86). This time, the FCC clearly had ethical problems that needed airing as well as the dismissal of Mack and Doerfer.

For more than a decade after 1950, there was almost always at least one congressional hearing or staff study of FCC activities underway in either the House or Senate or both. This period of investigation involved not only the commission's internal operations but also problems of the broadcasting industry. Although some broadcasting investigations may have been the proddings of a publicity-hungry congressman on a commerce, small business, or appropriations committee, the hearings of the late 1950s were more useful and less emotional than those of the early 1940s. The Senate Commerce Committee maintained a watchful eye on the FCC, and the commission knew it. Specific legislation and rule changes resulted, unlike the fizzle of earlier investigations.

8•84 *The Quiz and Payola Investigations*

Investigations of network quiz shows (see 8.63) drew most of the regulatory, congressional, and public attention. In late 1959, the focus shifted from New York and its grand jury proceedings to Washington where both a congressional committee and the FCC held hearings. The highlight, or low point, of the congressional hearings came when the *Twenty-*

Charles Van Doren on How the Quiz Shows Were Rigged / After considerable soul-searching, the popular quiz show winner finally appeared before the House committee investigating the quiz programs and told the shocked audience how he had been co-opted:

[*Twenty-One* Producer Albert Freedman] told me that Herbert Stempel, the current champion, was an unbeatable contestant because he knew too much. He said that Stempel was unpopular, and was defeating opponents right and left to the detriment of the program. He asked me if, as a favor to him, I would agree to make an arrangement whereby I would tie Stempel and thus increase the entertainment value of the program. I asked him to let me go on the program honestly, without receiving help. He said that was impossible. He told me that I would not have a chance to defeat Stempel because he was too knowledgeable. He also told me that the show was merely entertainment and that giving help to quiz contestants was a common practice and merely a part of show business. . . . Freedman guaranteed me \$1,000 if I would appear for one night. . . .

I met him next at his office, where he explained how the program would be controlled. He told me the questions I was to be asked, and then asked if I could answer them. Many of them I could. But he was dissatisfied with my answers. They were not "entertaining" enough. He instructed me how to answer the questions: to pause before certain of the answers, to skip certain parts and return to them, to hesitate and build up suspense, and so forth. On this first occasion and on several subsequent ones he gave me a script to memo-

rize, and before the program he took back the script and rehearsed me in my part. This is the general method which he used throughout my fourteen weeks on "*Twenty-One*." He would ask me the questions beforehand. If I could not answer them he would either tell me the answers, or if there was sufficient time before the program, which was usual, he would allow me to look them up myself. . . . When I could answer the questions right off he would tell me that my answers were not given in an entertaining and interesting way, and he would then rehearse me in the manner in which I was to act and speak.

After the first program, on which I tied Stempel three times, Freedman told me that I would win the next evening and be the new champion. My guarantee was increased to \$8,000. I again agreed to play, and I did defeat Stempel. . . . I asked [Freedman] several times to release me from the program. . . . He told me I had to be defeated in a dramatic manner. A series of ties had to be planned which would give the program the required excitement and suspense.

Source: House Committee on Interstate and Foreign Commerce, Special Subcommittee on Legislative Oversight. *Investigation of Television Quiz Shows*. Hearings, 86th Cong., 1st Sess., 1960. Volume II, pages 625-626.

One winner Charles Van Doren confessed his complicity in the rigging process, thus admitting that he had committed perjury before the New York grand jury. Van Doren's confession shocked the nation, more so because he was a relative of author-scholars Carl and Mark Van Doren and a faculty member of Columbia University. Former contestants, network officials, advertisers, agency representatives, and others also appeared before both the committee and the FCC and testified to the rigging story, giving a good picture of the pressures that brought about such unethical behavior. A rigged contest or quiz was a fraud on the public. Van Doren resigned his post at Columbia, and he and others fell into public disgrace although they did not go to jail. It was several years before he could publish again under his own name. The networks established stringent procedures for supervision of the few quiz shows still on the air and hoped that the worst was over.

But just as the quiz show situation was settling down, corruption in radio arose in the form of *payola*. Record manufacturers had recognized the importance of the disc jockey (see 8.61) in selling records. A few plays of a new tune on an important market's top rock station could spell the difference between wild success and failure. To persuade programmers and disc jockeys that a given record had Top 40, or Top 10, qualities required salesmanship as well as sending the DJ a sample record.

But the persuasion soon moved past consideration of the record's merit to gifts of money, liquor, and even women and occasionally drugs. In short, bribery. Important disc jockeys enriched themselves while accepting "guidance" in evaluating new records—a *payola* process dating back to the era of big bands. But in the late 1950s, concern over this illicit business

practice—a fraud because the public counted on the DJ's professional judgment and not his self-interest in selecting records—combined with the older generation's distaste for and impatience with rock music to put the whole issue before Congress. A House investigating subcommittee heard testimony from many famous disc jockeys, including Alan Freed and Dick Clark. Freed's disclosure that he had freely partaken of *payola* stopped his career cold, while Clark's admission of his widespread and interlocking business interests, which obviously entailed conflict of interest if not outright *payola*, marred his reputation. These revelations led to legislation intended to curb commercial bribery in record selection, and to reaffirm the licensee's responsibility for whatever went on the air.

The congressional committee and the FCC also discussed the practice of radio or television *plugola*, closely related to *payola*. This involved programmers or show hosts deliberately mentioning the name of a product or service. In due course the plugger would receive some of the product, or a case of whiskey, or cash. This was not sponsorship, because the station or network received no revenue from it, but the on-air personality received a welcome boost in effective annual income. This practice infuriated station management, which saw its employees undercutting its advertising rate card.

In December 1959, Attorney General William Rogers reported to President Eisenhower on the need for legislation to eliminate false and deceptive programming and advertising. At about the same time, FCC Chairman Doerfer announced a plan for expanding network public service programming—a form of penance, although it was not announced as such. It called for minimal public service programming on each network, rotating in prime

time. The networks had previously relegated such programming to fringe hours, but, desperate to regain viewers' respect, they agreed to Doerfer's plan and announced several new documentary and public affairs programs for the following season. Thus, by 1959–1960, action by the FCC (hearings into quiz show and payola scandals), Congress (more hearings, and some legislation), and the Attorney General (a report with recommendations)—all coalesced into amendments to the Communications Act that made rigged or otherwise deceptive programming punishable by law rather than merely admissible as possible evidence of unfitness of licensees at renewal time. The rigged programs left the air for good. Payola and plugola, however, while diminished, have continued to exist more or less underground. The various scandals, a failure of self-regulation, tarnished the image of broadcasting and paved the way for stronger governmental regulation.

8•85 *Self-Regulation: Improving Television's Image*

To undo some of the damage of the quiz show debacle, the National Association of Broadcasters set up a concerted public relations campaign. In October 1959, it created the Television Information Office (TIO), headquartered in New York and sponsored by television stations and networks, to give the public favorable information about all aspects of television. Its initial project was an Elmo Roper survey on public reactions to television following the quiz investigations—the first in a long series of similar, well-publicized reports. TIO also organized a library, provided study guides on specific television programs and series for elementary and secondary schools, and ran full-page ads in such prestige magazines as the *New Yorker*

and *Saturday Review* to convince opinion leaders that television could be beneficial.

One industry wound continued to fester during the 1950s: the blacklisting of talent for their political beliefs (see 7.86). In 1953 several members of the American Federation of Television and Radio Artists (AFTRA, the performers' and announcers' union) and individuals with American Legion and advertiser connections created Aware, Inc., which attacked alleged communist influences in broadcasting. Feeding on the anticommunist mood spearheaded by Senator Joseph McCarthy, this self-appointed group formalized the process of "clearing" performers whose background had been questioned—often by Aware itself. By competing for jobs with those it attacked, Aware members had at least one possible conflict of interest other than that of union members engaging in what might be considered a management activity. Aware's officers created a 12-step process through which an accused performer could publicly declare his rehabilitated thinking and once again become employable. That Aware was operating in several guises became obvious when, after the New York AFTRA chapter held elections, Aware began investigations of the candidates it had opposed. Only after a long and emotional fight did a group of independents capture control of AFTRA in 1955, ending the relationship between a union and an anticommunist minority of its members.

In the meantime, a candidate for AFTRA office found himself in deepening trouble. John Henry Faulk, a very popular New York radio personality, lost his CBS radio job in fall 1957 and suddenly found himself unemployable. His dismissal followed initiation of a lawsuit against Aware, which he accused of having caused an end to his radio sponsorship. CBS kept mum. But here the typical blacklisting case took

an unusual turn. Faulk decided to fight and, with the financial aid of CBS's Ed Murrow and other friends, took the matter to court. Aided by celebrated lawyer Louis Nizer, Faulk won a series of important preliminary decisions, only to be faced with dwindling financial resources. By 1960 the case grew progressively more complicated with the addition of other defendants who had allegedly organized a boycott or otherwise affected Faulk's and others' employment. Finally, in summer 1962, Faulk won and was awarded more than \$3.5 million—a record in libel judgments (although, because of the death of the chief defendant, he collected only a small portion of it). The decision was upheld on appeal two years later, effectively putting an end to the blacklisting movement. Blacklisting not only lost credibility but was exposed as the product of a few self-appointed—and often self-serving—extralegal guardians of political morality. In addition, of course, relations between the United States and the Soviet Union as well as the political tenor of the country had changed substantially between 1953 and 1962. Although numerous books, plays, and movies have been written about blacklisting, including Faulk's own, dispassionate chronicles are rare; too many of the persons hurt as both victims and prosecutors are still alive. But there is little doubt that the blacklisting decade was a fearsome time in which to work in broadcasting and other media; one never knew when all jobs would suddenly close up or when one would be disavowed by one's friends, without warning or explanation.

8•9 The Age of Television

By the late 1950s researchers knew that television focused individual (and national) attention more than radio had, and

that it was more concrete. But both media had a neutral point of view and a limited program choice, and both were essentially universal, with common symbols and approaches readily understood by the audience. Radio apparently stimulated the imagination more than television, but television was more glamorous and live television could provide a sense of "here and now" that was unmatched by any other medium. Like radio and sometimes more than radio, television seemed official and highly credible. But few viewers noticed these distinctions; they simply looked at and enjoyed television, and found new uses for radio's music and news.

The nation's colleges and universities paid little attention to television at first. It might be used as a tool (see 7.4 and 8.4), but, except for the work of a few social scientists, it was not studied formally as a medium (see 7.73). This was partly because professional training requires costly equipment and also because of the typical academic wait-and-see-if-it-is-more-than-a-fad approach to new things. It has been said that an academic discipline is identified by a professional association and a scholarly journal. The small University Association for Professional Radio Education (UAPRE) was organized in 1948, nearly died for lack of specific activities, and reorganized in 1956 as the Association for Professional Broadcasting Education (APBE). APBE, which changed its name in 1974 to the Broadcast Education Association (BEA), began publication of the quarterly scholarly *Journal of Broadcasting* in the winter of 1956–1957. The organization's purpose was to combine broadcasters, through an affiliation with the NAB, and educators in the common goal of solid career and liberal arts education in broadcasting. It now has approximately 200 schools and universities—and some non-voting individuals—as members.

8•91 *Television and Other Media*

By 1960 television was no longer a fascinating toy for the few; it was nearly universal. Thus, when households spent more time with television, other media sometimes suffered.

By and large the print media were not affected, though both newspapers and magazines sometimes catered to public interest in television at the same time that they downgraded the medium with which they were competing for advertising revenue. In the 1950s, television and print co-existed successfully, and such durable magazines as *TV Guide*, directly related to the growth of interest in television, *Sports Illustrated*, *Playboy*, and *American Heritage* all got their start. Many newspapers and general magazines published a television column, to join the few remaining radio columns. It can be argued that reviews or esthetic comment had little effect on audiences, since most reviews appeared after the public had seen the program. One critic said, in an aphorism long credited to comedian Jackie Gleason, that "television reviewing is like describing an accident to the victims." But such discussions helped raise the level of some programming by influencing television policy makers. Reviews by *New York Times's* Jack Gould and *New York Herald Tribune's* John Crosby, and other critics of stature, were frequently quoted and discussed in television circles, in colleges and universities and, less frequently, by other readers and viewers.

The relationship between motion pictures and television was another story, since television was one of three main causes of the decline of the feature film (see 7.91). By 1953, 25 percent of the nation's theaters had closed, with only drive-ins continuing to expand in number. Unemployment in Hollywood was up, while those still working feared both the film

blacklist and industrywide economic uncertainty. However, the filmmakers, undaunted, put out more color films—remember, most television was black-and-white—and experimented with wide-screen techniques impossible to reproduce on the home screen. The first of these was the three-dimensional (3-D) film, for which the audience wore cardboard and plastic glasses that converted a blurry picture to striking realism. The fad lasted for about 18 months and two or three dozen 3-D films. In its place came Cinemascope and similar processes which used a new wide film stock and special projection lenses to provide a picture about half again as wide as the normal movie. In 1956, a few theaters—some later were specially built for the process in major cities—were converted for Cinerama, which used three cameras and three projectors for a 165° wide picture with stereo sound. This gave a larger-than-life, startling, realistic, and spectacular three-dimensional effect but was expensive and required major modification to the theaters and very careful adjustment. Less expensive wide-screen techniques such as Cinemascope, however, rapidly became common even though they required special lenses for showing and subsequent cropping of the picture when later shown on a television screen.

The other prong of the film industry's response to television was to withhold all older films from television showings. But the film companies could not keep a united front past early 1956 (see 8.62), and before long thousands of old Hollywood films were appearing on individual stations, further depressing business at the neighborhood movie house. Having given in to television to this extent, Hollywood experienced a slow takeover by television in the late 1950s. By 1960–1961, when feature films were still scarce on the networks, a good proportion of the

film industry's employment and production was in filming series for network television showing. Although feature film workers decried the "takeover" of the film industry by television, live television workers in New York, now out of their jobs, wondered whether Hollywood had not taken over television! Some unusual developments occurred within this relationship; although many television series were inspired by hit movies, now some television programs (see 8.62) were made into films for release in theaters.

8•92 *Television around the World*

The worldwide expansion of television had been delayed by World War II and its aftermath, but by the 1950s many countries were building television systems. A "buy at home" philosophy, and the opportunity to build a state-of-the-art system by starting from scratch, led to a variety of technical standards, particularly in Europe, since Latin America and Japan had adopted the 525-line system used in the United States. France had an 819-line system and Great Britain had a 405-line system, but Europe eventually settled on two slightly different 625-line systems, one for eastern Europe and one for western. By 1960 eight countries each had more than one million television receivers in use: the United States, Great Britain, France, West Germany, Italy, Canada, Russia, and Brazil. In several of these countries, receivers were in public places, as in the United States in the late 1940s and early 1950s when there seemed to be more sets in bars and store windows than in homes. Because of these publicly located sets, the television audience in many of these countries was larger than the number of receivers might imply. In the United Kingdom,

the high cost of the "telly" was overcome through monthly receiver rentals rather than purchases.

Countries in the Western Hemisphere generally followed the United States model of private ownership and commercial operation, except for Canada, which had a BBC-modeled Canadian Broadcasting Corporation (CBC) as well as many private stations. In other countries, television was directly or indirectly operated by the government, even though costs sometimes led to commercial but not private operation. In Great Britain, the BBC had operated television as a monopoly since it started in 1936 except for a shutdown during the World War II period ending in 1946. But in 1954, after a long, involved parliamentary and behind-the-scenes debate, a commercially supported television system was established as an alternative to the BBC. Supervised by the Independent Television Authority (ITA), which franchised regional program production companies ("programme contractors") to use ITA-owned transmitters, the new service was supported by advertising rather than receiver license fees as was the BBC—although license revenues were diverted to aid ITA in its formative years. Program sponsorship is not allowed, in the *magazine* system of television advertising, with advertisers buying spots but having no control over their placement. The best programs were put "on the network" and aired by other contractors. Japan and Canada developed similar competing systems in which one channel or network was operated by the government and another privately. Most major foreign cities had only one to three channels of television fare, compared to the three to seven in the larger American cities.

Considering the high cost of television programming and the short geographical distances in Europe, it is not sur-

prising that the nations belonging to the European Broadcasting Union decided to exchange programs. This exchange, called "Eurovision," also permitted efficient pooling of effort for coverage of important sporting and other events. In eastern Europe, the International Radio Television Organization (OIRT) started a similar venture, "Intervision." After settling political and technical difficulties, the two systems occasionally exchanged nonpolitical programs.

In 1953 the U.S. Information Agency (USIA) was established to operate the Voice of America and print, film, and television propaganda activities of the United States government. Except for overseas operations directly under the control of an ambassador, it took over most State Department operational information functions and operated most overseas information and propaganda activities. Although the USIA distributed some material to be shown on foreign television systems, most American television programs went abroad through the efforts of commercial networks and program packagers. Foreign television systems provided an additional market for an American product, following the long-standing example of the feature film industry, as well as a new means of intercultural communication. Some commentators wondered what a constant fare of *I Love Lucy* would do to foreign opinions of the United States, and what effect it might have on the customs of foreign countries.

In Canada, regular television programming began from CBC stations in Toronto and Montreal in September 1952. A few months later, the government allowed expansion of the government-controlled CBC as well as privately operated television stations. By 1956, there were nine CBC and 30 commercial television outlets. As mentioned before, Canada used U.S.

technical standards, and operated only on the VHF channels. About half the Canadian population also could and did tune in to stations in the United States, since Canadian cities are located largely in a narrow band just north of the border. The CBC stations were supported by the proceeds of a 15 percent excise tax on receiver sales. By 1960 private stations had increased to 38, while CBC stations remained at nine, including three that broadcast in French. Few Canadian cities had more than one channel until after 1961. Television viewing was divided almost evenly between U.S. and Canadian channels, and much of the fare on the Canadian channels was American.

Mexican television began in the early 1950s when commercially run channels went on the air from Mexico City under authority of licenses that were good for 25 years. In 1953, the two major station operators combined to form Telesistema Mexicano S.A., which in the 1950s was to control the content of virtually all television in the country. By 1960 there were 25 stations on the air, all on VHF channels. A few stations located near the U.S. border programmed in English, very profitably directing their broadcasts to the north. For domestic consumption, most program content was produced in Mexico but was like the American fare—with the substitution of bullfights for baseball. Having got into television quite early, Mexico quickly became one of the chief program suppliers for the rest of Latin America, and later expanded into the United States with affiliated stations in markets with large Spanish-speaking populations such as Los Angeles and New York.

8•93 *Period Overview*

This space of eight years can be thought of as the evolution that followed

the 1945–1952 revolution. There were no fundamental changes in the industry; radio and television expanded within the patterns set in the immediate postwar years. AM radio and VHF television led this growth, with television networks becoming dominant in the broadcasting industry. FM radio had started out of its long decline by 1960, in part through subsidiary services and stereo; but UHF television was in serious trouble with small audiences and limited advertising income and usually no network affiliation. There was

growth in educational television and FM, but the audiences were very small and funding was a paramount problem.

To many observers in later decades, these were the golden years of television programming—primarily because most network programming was live and often spontaneous, and high-quality anthology drama was plentiful, since television production was cheaper than the movies or Broadway and thus more hospitable to young playwrights. Some of this perceived quality was actually present, but

Key Broadcasting Indicators: 1955 / This is the sixth of ten tables offering comparable information over a 50-year period (to 1975) at five-year intervals. Sources for items 1–6 and 11 are the tables in Appendix C, while other information comes from sources indicated below. Most data are for January 1.

Indicators	AM	FM	TV
1. Number of commercial stations	2,644	552	411
2. Number of noncommercial stations	ca. 25	122	11
3. Total stations on the air	2,669	674	422
4. Number of network-affiliated stations	1,355	na	374
5. Percentage of commercial stations affiliated with networks	50%	na	91%
6. Total industry revenue (add 000,000)	\$545.0	\$1.9	\$1,035.0
7. One-hour station rate (New York)	\$1,200	na	\$6,200
8. One-minute station rate (New York)	\$200	na	na
9. One-hour network rate, evening	\$26,000	na	\$101,000
10. Number of broadcasting employees	..... 45,300	.....	32,300
11. Percentage of families with sets	96.4%	na	64.5%
12. Broadcasting regulatory budget (FCC)	.....	\$6,911,769	.....
13. Total FCC personnel	.....	1,094	.....

Notes (see Appendix D for full citations)

na = not applicable or not available.

7–8. WRCA radio (later WNBC) and WRCA-TV (later WNBC-TV) in New York.

9. NBC radio (208 affiliates) and TV (186 affiliates) networks.

10. Radio figure covers both AM and FM, and networks. Lichty and Topping (1975), page 290, table 23.

11. FM figure would have been on the order of 1 percent or 2 percent.

12–13. FCC figures for fiscal year 1955, ending June 30.

part was due to the audience, which in the early 1950s had more income and education—due to cost of television receivers—than the general population. Yet the medium's problems were evident in growing concern about television violence, the quiz scandals, and so on. Many persons in the industry, in government, and among the public felt that television had grown too fast to develop ethics commensurate with its huge role in society. Part of the

problem was that the impact of television was becoming hidden by its very ubiquity.

No longer was the television set a novelty. No longer would programs seen the night before be the main topic of conversation at work or at play. Now television was merely something one sat in front of in the living room, and radio was something that provided music and news in the car, the bedroom, or the kitchen. There are many who believe that we are the poorer

Key Broadcasting Indicators: 1960 / This is the seventh of ten tables offering comparable information over a 50-year period (to 1975) at five-year intervals. Sources for items 1–6 and 11 are the tables in Appendix C, while other information comes from sources indicated below. Most data are for January 1.

Indicators	AM	FM	TV
1. Number of commercial stations	3,431	688	515
2. Number of noncommercial stations	ca. 25	162	44
3. Total stations on the air	3,456	850	559
4. Number of network-affiliated stations	1,153	na	496
5. Percentage of commercial stations affiliated with networks	33%	na	96%
6. Total industry revenue (add 000,000)	\$692.4	\$9.4	\$1,627.0
7. One-hour station rate (New York)	\$1,200	na	\$9,200
8. One-minute station rate (New York)	\$175	na	na
9. One-hour network rate, evening	\$12,100	na	\$151,500
10. Number of broadcasting employees	51,700	1,300	40,600
11. Percentage of families with sets	95.6%	10%	87.1%
12. Broadcasting regulatory budget (FCC)	.....	\$10,550,000 .....	.....
13. Total FCC personnel	.....	1,396 .....	.....

Notes (see Appendix D for full citations)

na = not applicable or not available

7–8. WRCA radio and TV (NBC flagship stations) in New York.

9. NBC radio (202 affiliates) and TV (192 affiliates) networks.

10. AM radio figure covers both AM stations and networks. Lichty and Topping (1975), page 290, table 23.

12–13. FCC figures for fiscal year 1960, ending June 30.

for that change—when the excitement died, broadcasting became ordinary and familiar. Ed Murrow, in a 1958 speech to his colleagues in the Radio-Television News Directors Association, summed it up with “This instrument can teach, it can illuminate; yes, and can even inspire. But it can do so only to the extent that humans are determined to use it to those ends. Otherwise it is merely wires and lights in a box.”

Further Reading

Probably the best single book describing broadcasting in the late 1950s is the first edition of Head (1956), followed closely by Bogart (1956, 1958), which stresses the impact of television. Wylie (1955) examines some of the industry’s problems, while Barnouw (1970) focuses on social history during the early years of television. Lichty and Topping (1975) include sections of interest. The structure of the industry is seen in CBS’s *Network Practices* (1956) and the extensive U.S. Senate Commerce Committee *Television Inquiry* of that same year. Diamant (1971) offers insight into early television advertising, and the FCC’s *Network Broadcasting* (1958), together with its interim programming reports (1958, 1963), offers invaluable details on network decision-making. The best overview of broadcast advertising practice is Seehafer and Laemarr (1959).

Educational broadcasting is discussed in Powell (1962), the NAEB’s activities are reviewed in Hill (1965) and Alford (1966), and an overview of both educational radio and television appears in Saettler (1968). A history placing educational broadcasting events of the 1950s in context with recent happenings is in Wood and Wylie (1977).

Books on programming are common, but unfortunately usually offer little solid information. The best descriptive alphabetical listing of network programs is in Terrace (1976). Though heavily pictorial, the following are useful guides to program types and titles: Settel and Laas (1969), Shulman and Youman (1966), Blum (1959), and Michael and Parish (1972), which reviews television program history by relating the story of the Emmy awards. Wilk (1976) provides a nostalgic overview of television programs in the 1950s. Allen (1956) offers insight into the television comedian, Passman (1971) reviews music in local radio, and Glut and Harmon (1975) provide an overview of television programs and heroes in the 1948–1960 period. Chester (1969) reviews television’s growing place in politics, while Friendly (1967) and Kendrick (1969) analyze the pioneering work of Edward R. Murrow in broadcast journalism. Early television documentaries are the subject of Bluem (1965).

Major television audience studies in addition to Bogart, noted above, include Elliott (1956) and the valuable Steiner (1963) report of a 1960 national survey of attitudes toward television. After 1956, additional material can be found regularly in the *Journal of Broadcasting*. See also the two seminal studies of children and television discussed in the text: Himmelweit, Oppenheim, and Vince (1958); and Schramm, Lyle, and Parker (1961).

Overviews of the regulatory developments of the period are to be found in Smead (1959), Emery (1971), the FCC *Annual Reports*, and the Fall 1957 and Winter 1958 issues of *Law and Contemporary Problems*. Apart from the House Committee hearings on the quiz show and payola scandals, the best reading on the subject is Weinberg (1962). For the end of blacklisting, see Faulk (1964) and Vaughn (1972).

Accommodation
and Adjustment
(1961-1977)



"I invite you to sit down in front of your television set when your station goes on the air and stay there without a book, magazine, newspaper, profit-and-loss sheet or rating book to distract you—and keep your eyes glued to that set until the station signs off. I can assure you that you will observe a vast wasteland."—FCC Chairman Newton N. Minow to NAB convention, 1961



Accommodation
and Adjustment
(1961–1977)



“... there always will be, of necessity, a TV wasteland. The three TV networks must produce 10,950 hours of entertainment per year, in contrast to only 600 hours demanded of the entire moving picture industry of our country and the 125 hours per year demanded of the Broadway theater.”
—Ed Sullivan testifying before the FCC, 1961

Television was not *all* wasteland. For special events, it was the medium to which everyone tuned. Perhaps the most dramatic occasion was the four days starting November 22, 1963, when radio and television served as the ears and eyes of the American people, bearing witness to the shocking assassination of President John F. Kennedy. For these four days almost all at home watched solemn and terrible events, listened to attempts to make them meaningful, and finally found some relief in the tributes from the nation's performing artists. It made no difference that most people got the first news by word-of-mouth, or whether they saw the shooting of the suspected assassin on their screens two days later—broadcasting brought the

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American people together through those days.

Another FCC Commissioner, Lee Loevinger, has called the journalistic function of the media “essential.” Just a year before President Kennedy’s assassination, listeners and viewers had stayed close to radio and television for ten days as the United States and the Soviet Union stood on the brink of nuclear war over Russian placement of missiles in Cuba. News and special programs gave a gripping portrayal of the crisis, and President Kennedy delivered clear warning over the air of his intentions. After 1965 the steady buildup of American troops and commitment to South Vietnam was covered in the “living room war”—perhaps the most frustrating war this country has ever fought. The dramatic peak and possible turning point of American public opinion may have been the 1968 Tet offensive and the summary execution of a communist suspect on a Saigon street before NBC cameras. In 1968 there also were domestic assassinations and a violent demonstration outside the Democratic national political convention in Chicago. A year later, the nation and much of the world were watching when Neil Armstrong became the first man to walk on the moon. Toward the end of this period, the nation watched the fall of a President, as the Watergate scandal finally led to Nixon’s resignation, the brief administration of the first nonelected president, Gerald R. Ford, and the second set of “great debates” and the start of President Jimmy Carter’s administration.

The 15 years from the cold winter day when John Kennedy was inaugurated to the warm summer evening when Richard M. Nixon resigned were increasingly complicated and tension-filled. The country careened from domestic problem to foreign crisis and back again. In a world where many people wanted simple black-

and-white answers, even the gray alternatives were getting harder to find.

Many Americans understandably retreated, when possible, to another world—a world of small pictures that provided hours of entertainment. Millions found *Perry Mason*, *The Beverly Hillbillies*, and *The Lucy Show* a welcome respite from the harsh truths of news programs. Daily serials and game shows on television, and music and talk on radio, helped pass the hours for housewives and youth. Radio, liberated by the transistor from the weight and expense and fragile tubes of earlier models, appeared everywhere. It was soon a standard accessory of the nation’s urban youth—to carry a blaring radio on the street was the symbol of being “with it” and “tuned in.” For the first time, the general public listened to an academic theorist, Canadian Marshall McLuhan, who spoke fluently, if sometimes confusingly, of the degree to which broadcasting, and to a lesser extent other media and elements in society, had become an integral part of modern life (see 9.9).

But behind the scenes, generally unknown to the public, were the tensions of an industry beset with growth and change. More stations, particularly FM, went on the air, dividing the audience and the advertising pie into ever smaller pieces with sometimes devastating results for the newcomer. The television industry feared mounting competition from cable television, and the FCC was caught in the old problem of how much to protect an existing industry in the face of a new one. Public concern about violence on the air and its effect on youth pushed Congress into sponsoring the biggest research effort ever connected with broadcasting (see 9.72), and questions about fair treatment of controversial issues plagued broadcast management. Government concern, sometimes politically inspired, about concentration

of ownership added to the industry's headaches.

Since we are still so close to the events of this period, and since there are so many conflicting currents and counter-currents, we see this chapter more as evocative of the mood of broadcasting after 1961 and the public's reaction to it than as definitive.

9•1 New Technologies

In 1960–1961, most broadcasting equipment—home receivers and station and studio equipment—used electronic tubes similar in principle to those manufactured in the 1920s. The invention of the transistor by scientists in the Bell Labs in 1948 did not have an effect on broadcasting until the early 1960s, when their cost fell low enough to allow their widespread use. Transistors permitted more compact construction, cooler operation and thus longer life, and use of much less electric power. By the late 1960s transistors were giving way to even more compact successors, which were direct outgrowths of the nation's space research. First came printed circuits that reduced a series of tubes, resistors, capacitors, and other components to a sheet of plastic with many of the components literally painted or printed thereon and with sockets for transistors studded about. Then came truly microscopic integrated circuits, which were grown in a solution and then cut apart, and which incorporated the equivalent of transistors as an integral part of the tiny structure. The trend to smaller and more rugged, if somewhat sensitive to heat and humidity, components made automatic assembly of virtually all electronic equipment possible and therefore easier, quicker, and less expensive.

There had been rather unsuccessful

ful automated radio programming experiments as early as the 1940s. But now, with more reliable electronics, timing units could be connected to long-running tape playback machines, allowing a station to be prerecorded and run automatically for hours. FM stations, short of cash to pay personnel—always the largest part of any broadcasting station's operating costs—often were the first to use automation. Their music-and-little-talk formats of the 1950s and early 1960s lent themselves to this approach. Several companies specialized in offering both the equipment *and* the programming suitable for automated operations. While this led to distant stations sounding almost alike, companies rarely sold a given programming service to more than one station in a market, thus maintaining the appearance of program competition.

Coming at the same time as automation, and, indeed, forming part of most automation systems, was the tape cartridge. Reel-to-reel magnetic tape recordings had increasingly replaced disc records until about 1960. In that year a small plastic-enclosed *single hub* self-contained cartridge of tape, activated by a shove into the slot of a special tape player, was developed. Foolproof; no need to set up the reels or find a starting place on the tape—just grab the cart and shove it in. This made the fast-paced formula or Top 40 station far easier to operate. Cartridges were used mainly for commercials and other segments from 15 seconds, or even less for station IDs, to about 10 minutes. As carts became available in half-hour and hour lengths, their use in radio broadcasting grew, with much programming originally in other formats transferred to carts. From the studio the cartridge spread to the consumer in the form of playback machines, and radio-recorders, in automobile and home.

By 1964, however, the cartridge had competition from the even smaller and lighter *two hub cassette*, developed by Phillips (Norelco in the United States), the giant Netherlands electrical manufacturing company. While the cassette did not have the impact of the cart in broadcasting, other than providing reporters with small and lightweight recorders, it made rapid gains in the consumer market. Phillips wisely made it cheap and easy for any manufacturer to make cassettes, not restricting it to their own companies, which led to rapid adoption of the technology. Cassette-radio combinations became increasingly popular.

The next home audio development seemed likely to be four-channel or quadraphonic hi-fi systems. But disagreement over standards for the new service between advocates of the *matrix* and the *discrete* systems, and the high cost, virtually doubling the cost of a stereo system, led to very slow adoption. Although the first quadraphonic broadcasts had been aired in Boston and New York in 1968, using two cooperating FM stereo stations in each city, true *quadraplex* (four channels over one station) transmissions were not tried until the early 1970s. Because such transmissions required dropping any Subsidiary Communications Authorizations (SCA) the station was operating, few stations had an incentive to inaugurate four-channel broadcasting. Until the manufacturing industry agreed on which system to use, and until record and tape companies supplied an adequate amount of music for the new system, four-channel sound would grow slowly.

These problems of audio standards seemed almost simple when contrasted to video variations. By the late 1960s, two roads for video expansion seemed possible: cable television or home video recording systems. Some crystal ball gazers saw both in the cards: cable now,

and home VTR or videodisc systems later. No one yet knows. Cable, having grown slowly since 1949 (see 8.24), was already present on the broadcast scene. By the early 1970s some people predicted that CATV would oust over-the-air broadcasting. Possibilities included store purchases by cable, doctors' visits by closed-circuit television via cable, two-way interconnection with computers using a telephone as the home terminal, meter-reading and home protection devices activated through cable, and other *wideband communications* devices leading to the "wired nation." But in a couple of years cable seemed to have lost momentum, and the economic recession of the mid-1970s shelved most of these ideas (see 9.22), although the number of homes served by cable continued to grow.

Economics and burgeoning technology also played a large part in delaying home video systems that could play whatever a person selected whenever he or she wanted. Programming would be for the individual. The first home videotape recorders, essentially the same as the relatively inexpensive helical-scan VTR machines used by industry and education, had little impact when they appeared in 1965, although they cost far less than quad-head broadcast-quality VTRs. Laboratories also were developing new systems based on videotape, film, and even lasers, and promising them first for industry and education and shortly afterwards for the home market. In the late 1960s, CBS Laboratories promoted, but later sold, its revolutionary Electronic Video Recording system (EVR). This heralded combination of film and television was supplanted by another possible pot of gold at the end of the rainbow, the video disc. Developed first by Phillips, the video disc, on its own special machine, could provide both picture and sound for a half-hour or so on a side. Other companies were developing their

own, incompatible technologies. The benefits of the disc over a cassette videotape system, several of which also were being developed, were analogous to those of the phonograph disc over the cylinder; countless copies could be stamped out at very low cost per unit. But this market too was held back by unsettled standards and the economic crunch of the mid-1970s.

A major development in long-distance communication, threatening to destroy AT&T's long-held monopoly on network interconnections and making remote pickups possible from almost everywhere in the world, is the communications satellite. Predicted in detail as early as 1945, the technology for these devices was developed after 1957 when the Soviet Union launched the first artificial orbital satellite. It took only a few years to progress from placing a tape recorder aboard a satellite to broadcast a Christmas message from President Eisenhower (1958) and bouncing signals off a passive orbiting balloon named "Echo" (1960) to using active satellites that could receive messages and retransmit them on another frequency. Most early satellites were in orbits from a few hundred to a few thousand miles high, including AT&T's pioneering "Telstar," launched in July 1962, which was capable of relaying television pictures across the Atlantic when in the proper orbital position. Later ones were in synchronous orbit 22,300 miles high. At this altitude a satellite maintained its position relative to the earth, appearing to be stationary and thus an easy target for transmitting and receiving antennas on the ground.

These satellites, starting with "Early Bird" and going through various more sophisticated "Intelsats," were generally launched by the National Aeronautics and Space Administration (NASA) for the Communications Satellite Corporation (COMSAT), a corporation created by Con-

gress after considerable debate. COMSAT not only handled the United States side of international satellite circuits but managed the global network for the multinational International Telecommunications Satellite Consortium, INTELSAT. Although AT&T owned Early Bird and Telstar and, originally, a large portion of COMSAT stock (which was divided roughly 50–50 between the general public and U.S. common carriers such as AT&T and Western Union), it sold most of its interest in COMSAT in the early 1970s. The FCC had approved a domestic satellite policy which effectively limited the Bell System to providing local ground connections at transmitting and receiving stations. Although the Soviet Union in the 1960s and Canada in the early 1970s had established domestic communications satellite systems, the rush in the United States did not occur until Western Union's "Westar" was launched in 1974. Several companies leased channels on Westar and then retailed access to them at a considerable saving over AT&T land-line tariffs. The networks began to investigate interconnection by communications satellites in what might be thought of as the first breach in the 1926 agreements between RCA and AT&T (see 3.23). The development of mobile ground stations—such as the one President Nixon took on his trip to China in 1972—together with satellites permitted full telecommunications facilities, including several television channels, almost anywhere. Home Box Office, a pay-cable company, started to distribute programming by satellite to cable system *head ends*, and there was even talk of direct satellite-to-home broadcasting. In practice, the closest to home broadcasting that the satellite technology of the mid-1970s could provide was transmitting by satellite to relatively expensive receivers in a given school or village. Experiments with such a system were first tried

in the Rocky Mountain area of the United States, but the satellite was then moved to India for a large-scale demonstration.

Other technological developments of the 1970s included work on optical fibers, which could carry amazing amounts of information in a fiber smaller than a human hair; lasers, for use in some videodisc playback units and in feeding optical fiber circuits; and computers and data storage and retrieval systems, with some application to broadcasting expected in later years.

9•2 Station Population Explosion

Broadcasting station growth continued into the 1970s, but the pattern was different. Despite FCC efforts to slow this growth (see 9.21), AM stations increased from about 3,600 early in 1961 to approximately 4,500 by 1977—even though engineers had considered the AM band crowded with only 950 stations in 1945. But radio's most prominent growth—a surprise to long-time industry observers—was in FM. Commercial FM stations increased from about 800 in early 1961 to more than 2,900 in mid-1977. Even more dramatic, educational FM radio stations increased from 170 to more than 870. All told, there were more than 3,800 FM stations on the air by mid-1977, a figure approaching the number of AM stations. Television grew somewhat more slowly, from 560 commercial, mostly VHF stations, in 1961 to more than 720, all but 211 VHF, early in 1977. But educational stations increased from 50 stations in 1961 to more than 250 by 1977. From these figures come three interesting conclusions: (1) FM was the fastest growing broadcast service, (2) educational FM and television grew very rapidly, giving educators the transmitters they desired, and (3) even by 1977, use of UHF

channels was slight, with only 368 UHF stations, 157 of them educational, versus 616 VHF stations, 101 of them educational, even though far more UHF channels have been allocated and assigned. The VHF–UHF problem (see 8.81) obviously had not yet been solved, and the sustained growth of other services led to problems of crowding.

9•21 *Slowing AM and Expanding FM*

It is hard to believe, from data in Appendix C, table 1, that for nearly half of the period after 1960 there was a freeze on new AM license awards. From May 1962 to July 1964, and again from July 1968 to February 1973, the FCC stopped most licensing of new AM stations while seeking rule changes to limit growth on that band. The problem had technical, economic, and political aspects, all interrelated. Most stations starting after 1961 were limited to daytime operation. Although most regions, particularly metropolitan ones, did not need another daytime station, adding nighttime stations would have caused massive interference elsewhere. By the 1970s, the largest markets were served by from 20 to 70 different AM or FM radio stations. In some places there were too many stations to divide the available advertising dollars effectively; 40 percent of the radio stations were already marginal or losing money. Television had taken much of the audience, and salable program formats were few. But politically, it was difficult to persuade persons wanting to get into the radio industry and smaller communities that desired more outlets that AM growth had to stop. Finally, at the end of the second AM freeze in 1973, the FCC issued stringent rules for considering a request for a new AM station. Such a station

would have to provide a first service—that is, for a community in which at least 25 percent of the coverage area or 25 percent of the population had no radio service at all. If an unused FM channel was available in the area to be served, no AM grant would be made.

Earlier, in fall 1961, the commission had decided to resolve the question of clear channels, which had been dragging on since the allocation hearings of 1944. Complaints about the inherent unfairness of the clears, originally established by the FRC in 1928 (see 4.82 and 5.22), and the desire to make room for even the lowest-power AM station 'had finally overcome the arguments for their retention. The FCC decision was to "break down" 13 of the 25 1-A channels in the United States. Naturally, the high-powered stations on these channels fought this move through the final judicial decision of November 1963 upholding the FCC. By the early 1970s, very few clear channels were still clear, or operating alone on that channel day and night. Some remained clear, or protected by the width of the continent, at night, but many new low-power or daytime-only stations had been squeezed in to provide local service.

As the number of FM stations grew, the commission found it had to improve its assignment structure. To avoid the first-come first-served shoehorning typical of AM since broadcasting's start, both FM and television channels eventually were assigned to specific communities to permit orderly and efficient growth and to avoid concentration of facilities in the largest cities. In July 1962 this resulted in the establishment of three main classes of FM station plus provision for 10 watt non-commercial educational stations: Class A, low power (100 watts to 3,000 watts), and a restriction on antenna height to 300 feet above average terrain leading to a service

radius of about 15 miles, and a distance between stations on the same channel of 65 miles; Class B (5 kw to 50 kw), 500-foot limit, 40-mile service radius, and 150-mile co-channel spacing; and Class C, high power (25 kw to 100 kw), 65-mile service radius, and 180-mile co-channel spacing. Using these standards, the commission assigned nearly 3,000 potential stations to about 1,800 communities. Classes A and B were to be used primarily in the crowded Northeast and in Southern California, while Class C would be allowed only in other parts of the country. Most existing stations were "grandfathered."

This reassignment ended several years of concern and a short freeze on issuance of new FM licenses. With the thaw, and with the stereo standards decision (see 8.11), FM stations began to increase rapidly. Most new stations were equipped for stereo broadcasting, so that, as older stations slowly developed stereo capability, about one-quarter of the FM stations were broadcasting in stereo by 1965 and about two-fifths by 1971. These studio and transmitter changes were costly, and for a while there were too few stereo-equipped receivers to make the decision pay off. But with the increasing availability of stereo, and later four-channel, sound in tapes, records, and broadcasting, more and more stations took the plunge. By the mid-1970s, a large majority of FM outlets could broadcast in stereo.

As FM stations approached AM stations in service area and size of audience, FM channels assumed greater value to broadcasters. The commission, taking full notice of their potential equality, considered separating AM and FM ownership in the same community. A 1963 rule led to partial nonduplication of programs between the two radio services (see 9.61) in all but the smallest markets. The FCC was constantly considering eventual breaking

up of AM-FM ownership and programming combinations in the same market. FM stations were bringing steadily higher prices, with the first million-dollar sale taking place in 1968. Soon, the majority of FM licensing cases required comparative hearings, as would-be broadcasters competed for channel assignments. In addition, the unusual loyalty of FM audiences caused problems as stations changed hands and new managers tried to change format. A classical music FM station in Chicago (WFMT) was sold to the *Chicago Tribune's* WGN and ran into a well-organized public complaint campaign fearing it planned to adopt a different music format. WGN finally gave the station to an educational operator who would continue the classical music format. A New York classical music station (WNCN) changed hands and went to a pop format in 1974, raising an outcry from its listeners. Political considerations of “concentration of power” gave strength to these protests. Despite, or because of all this, FM stations in some markets achieved respectable audience ratings in competition with AM stations for the first time (see 9.61 and 9.71).

The multiplicity of broadcasting stations—approximately 9,300 by 1977—made heavy paperwork for both the commission and the stations. Smaller stations especially complained bitterly to Congress and the commission. Finally, in 1973, the FCC cautiously started a process of re-regulation to simplify and loosen some technical and record-keeping requirements.

9•22 *Television: UHF, STV, and CATV*

In the 1960s, many of the parallels between UHF television and FM radio disappeared. While FM grew and even prospered, UHF television grew so slowly that

even a 1962 law requiring UHF and VHF reception capability on all new sets sold in the United States did not immediately help (see 9.7). Few new UHF stations went on the air, few UHF-equipped sets were made before the mid-1960s, and broadcasters, advertisers, and viewers showed little interest in UHF (see 8.81). It was a circle that UHF was unable to break. However, in the decade after the 1964 effective date of the all-channel receiver law, UHF added 111 stations while VHF added only 47, largely because of a shortage of desirable channels. Probably both the legislation and the increasing scarcity of desirable VHF channels helped UHF growth.

VHF scarcity was implicit in the 1952 *Sixth Report and Order* (see 7.83), and became evident with the 1965–1966 reassignment and reallocation of television frequencies. While the original plan offered a total of 551 commercial VHF assignments, only about 40 of these, mostly in very small western towns, were not on the air by mid-1977. On the other hand, of 590 commercial UHF assignments, nearly 400 are still vacant. Much the same pattern existed for educational television (see 9.4), although a much higher proportion of UHF assignments was in use. In 1952, 242 educational channel reservations had been established, a number raised to 615–508 on UHF—in 1966. In 1966 the FCC stopped assigning channels above channel 69, although the 1952 *Sixth Report and Order* allocation included UHF channels through 83. For various reasons, television stations on the top 14 channels had poorer coverage capability than stations lower in the spectrum, and most higher numbered channels were used only for low-power translators. This waste of spectrum space, combined with other options for its use—translators or the growing and aggressive land mobile, safety, and special radio services—led to the FCC’s decision to re-

move these 84 MHz permanently from television broadcasting in May 1970.

This reallocation plus the earlier all-channel receiver legislation effectively ended FCC plans for deintermixture or any other 1950s proposals for rescuing UHF (8.81). The general hope now was that natural growth would increase in UHF and that the growing audience would attract advertising money and improve station finances.

Another major matter at least temporarily laid to rest in this period was pay or subscription television (STV). The focus of long debate in the 1950s (see 8.23) and a battle with Connecticut film theater owners that went all the way to the Supreme Court, pay-TV was given a test from 1962 to 1968 in Hartford. Like so many other earlier tests, it was inconclusive.

The biggest operational attempt at pay-TV took place in California, using wires to provide three programs besides those received off the air and maintaining free on-air television channels. Former NBC president Sylvester "Pat" Weaver led the Subscription Television company, whose 1964 venture had \$25 million in capital, the backing of major corporations, and several important sports and entertainment contracts, including the Giants and Dodgers baseball teams. Movie theater owners led the fight against pay-TV, with the broadcast industry, wary of the Fairness Doctrine, taking a decidedly secondary role. While anti-pay-TV people gathered signatures on petitions to put the issue to a vote in the fall elections—California law permits referendums—pay-TV made a midsummer debut in the Santa Monica section of Los Angeles with about 4,000 subscribers paying to see new—but often not as new as hoped—films, educational and cultural features, and sports. Although STV had the backing of numerous Hollywood stars on the lookout for a

new market and although it briefly expanded to San Francisco, the costs of the public opinion fight forced the Weaver group to curtail operations. In November, voters killed pay-TV by a nearly two-to-one margin. The vote later was declared unconstitutional, but by then the company was out of money and out of business.

In Congress bills were introduced to outlaw pay-TV, and both sides sent out heavy propaganda. Finally, the battle centered on three areas: the House Commerce Committee, which continued to hold hearings and ask the FCC to delay a decision; the FCC, which said it was ready to establish rules allowing regular STV operation under very controlled conditions; and the experiment on Channel 18 in Hartford, which was approved in 1968 for three more years, having already run for six. However, Zenith took the experiment off the air due to the impending FCC decision and the need to convert to color.

In December 1968 the FCC adopted rules allowing pay-TV but delayed implementing them until Congress had time to react. To be shown for pay, movies had to be less than two years old and sports events could not have appeared on free television in the previous two years; no continuing series could be shown. Over-the-air pay-TV could be established only in cities with more than four commercial stations and would have to operate a minimum of 28 hours a week. There could be no commercials, and at least 10 percent of the offerings had to be other than sports or movies. Technical standards were announced in fall 1969. A 1971 "antisiphoning" rule extended the ban on pay-TV use of sporting events to five rather than two years, and banned special sports events like the Olympic Games for ten years after their last network or free television showing. By 1974 three technical systems had been approved for operation, the first being Ze-

nith's pioneering "Phonevision." Applications for stations in different markets had been received, and several approved by the FCC; but the first two over-the-air pay stations (one in Los Angeles, the other in a New Jersey suburb of New York City) did not get on the air until spring 1977.

Most pay-TV in the United States is a service of some cable systems rather than broadcast. By mid-1976 more than 750,000 subscribers paid to receive programs on special channels of 250 cable systems. The ability of these systems to charge for special programming made their operation far more attractive to investors.

Cable television had grown very slowly during the 1950s and early 1960s. By the mid-1960s, more than one million homes out of more than 60 million were on the cable, and more than 1,200 systems were operating (see Appendix C, table 10). Systems continued to increase in number and size, so that by early 1977 just over 17 percent of the nation's homes were hooked up to one of more than 3,700 cable systems, mostly in rural and suburban areas, particularly of the West. Cable's fortunes improved in 1965–1966 partly as a result of increased regulatory activity (see 9.83). Some cable systems began to originate programming, most provided far better reception of color programs, and many larger towns began to use cable television. This last development reminded the FCC of past experiences with uncontrolled growth in big cities, and it put a freeze on signal importation into the nation's 100 top markets.

But cable was growing in other ways, although probably not as fast as industry publicity would have one believe. As equipment improved, systems expanded their capacity from three to five channels to ten or more, and the technology allowed 20 or more at a time, although only 12 percent of systems had this capa-

bility by 1977. As the investment required to build systems increased, the traditional "Mom and Pop" cable companies gave way to the better financed and managed Multiple System Operator (MSO). With this development the FCC became concerned over concentration of ownership, and in early 1970, it prohibited CATV system ownership by telephone companies or television stations in the same market area, and of cable systems anywhere by national television networks. As more cable systems became program originators, the FCC tried various ways to prevent undue concentration of control.

This FCC action had, as a side effect, established contention among cable systems and broadcasters and some telephone companies, which charged CATV high—perhaps exorbitant—rates to rent space on their poles. Skirmishes between broadcasters and cable operators sometimes led to decreased service to the public. By the late 1960s, the National Cable Television Association (NCTA) was facing off against the National Association of Broadcasters in arguments over copyright, program carriage, signal importation, and other regulatory issues of economic and political importance to both sides. Because of the potential effects of cable on the public, Congress took an increasing interest in CATV. Broadcasters were not united, since CATV provided larger audiences for many stations, especially the hard-pressed UHF outlets, and because many broadcasters owned cable operations in communities outside the range of their stations.

But the public was being told that CATV was the greatest invention since the zipper with its new programming and new outlets for people with political, social, and economic interests not served by the broadcast system. New York and other large cities, already well served by on-air stations, acquired their first major cable

systems. Unfortunately, the high cost of wiring in the city and insufficient new programming to interest potential subscribers left many cable operators—some of whom made money from tax loopholes rather than from any concern for the public interest—with a hand-to-mouth livelihood. The recession of the mid-1970s and the natural caution of many MSOs, particularly in light of the failure of the New York systems to make a substantial profit, dimmed cable's promise for the time being.

9.3 A Continuing Network Pattern

The basic pattern of network operation continued. The FCC finally banned option time agreements in mid-1963, an action first proposed in the 1941 Chain Broadcasting Report (see 5.83 and 8.82), but by this time most industry observers felt it would have little effect, as FCC rule changes and competitive pressures had made network and affiliate relations more flexible. Early in 1965 the commission proposed limiting the financial control of networks to 50 percent of the programs they carried, with no part in syndication. The ostensible point was to enhance competition and possibly other points of view by allowing other production sources to enter the network television market. This rule aroused such strong opposition that the commission withdrew it but returned in May 1970 with another approach to the same end. This would limit network programming in the top 50 markets between 7 P.M. and 11 P.M. (6 P.M. to 10 P.M. in the Central and Mountain Time Zones) to three hours—in effect, removing a half-hour the networks had programmed for their affiliates for years. The commission allowed syndicated “off-network” shows for the

first year of the rule and then insisted on either station-produced shows or independently syndicated material, with the expressed hope that stations would use the time for local public affairs programming. The unfortunate result was a flood of inexpensive syndicated entertainment material—game shows, travelogues, some cheap variety and adventure programs—that was little different from network programs. The Prime Time Access Rule (PTAR) has been debated, modified slightly, nearly modified again, and debated some more but was in force as this was written. In 1972 the Justice Department filed antitrust suits against the networks in a possibly politically motivated attempt to further diversify program control. The suits were later dismissed and still later (1974) reinstated, suggesting a lengthy court battle ahead.

Late in 1976, NBC settled with the Justice Department out of court. The terms, generally favorable to the network, would not be operable until the ABC and CBS suits were settled. But at the same time, pressure was building for a full-fledged FCC investigation of the networks, prompted by a petition to the Justice Department, passed on to the FCC, from multiple station owner Group W (Westinghouse), which was concerned over the increasing control of television revenue by the networks—and consequent reduction in station revenue.

The long-lasting Yankee and Don Lee regional radio networks both folded in 1967. All networks changed their top management, retiring pioneers in television and bringing in younger people, some with little or no broadcasting experience. Network broadcasting stopped being special and began to approximate other businesses. In 1967 a national labor dispute took most performers and live programs off the air. The American Federation of

Television and Radio Artists (AFTRA), a performers union, called a strike over the wages paid announcers at network-owned FM stations. It quickly got out of hand, and CBS viewers tuning in the first night of the strike heard a bespectacled young man introduce the evening news with "This is Arnold Zenker substituting for Walter Cronkite." Except for a few like NBC's Chet Huntley who felt newsmen had no business on picket lines, news and entertainment figures respected the strike, and live shows were replaced with reruns or other canned programs. The dispute was settled just two hours before the scheduled beginning of the motion picture academy "Oscars" telecast, a major viewing event each year. Cronkite came back on that night deadpanning "This is Walter Cronkite, substituting for Arnold Zenker." Temporary news anchorman Zenker, a lowly CBS executive, went to an on-air career in Boston and later in Baltimore on the strength of this sudden thrust into the spotlight.

ABC had particular problems that almost led to a controversial merger. By the 1964–1965 season, ABC had become competitive in ratings with both CBS and NBC. Long a distant third in popularity and advertising billings, ABC had gathered large audiences through the Disney program (see 8.62) and formula-ridden action-adventure shows. One year later, its new position of strength was in danger as the other two networks, led by NBC, began to program major amounts of time in color. ABC lacked sufficient capital to purchase color cameras, VTRs, and other equipment necessary for equal competition. While NBC prime time was nearly all color and CBS about half-color, ABC trailed into the season with 60 percent of prime-time programming still in black-and-white. Its ratings and its reputation with advertising time buyers suffered.

ABC, casting about for new investment funds, and International Telephone and Telegraph (ITT), looking for new acquisitions, found each other late in 1965. The two soon announced that they would "merge"; that is, ITT would take over ABC and make major financial investments to strengthen its competition with the other networks. Because ABC owned stations, the merger would be subject to approval by the FCC and the Justice Department, whose antitrust division already was concerned with ITT president Harold Geneen's operations. The FCC held hearings on the proposed merger in September 1966, and two months later the Justice Department asked the FCC to delay its decision. The commission, however, approved the ITT takeover, 4–3. In January 1967, Justice requested that the FCC reopen the hearings to consider continuing major issues and some new data. ABC stock dropped 14 points at the news. Faced with a tightening battle for ratings and resulting advertising income, ABC asked ITT for a \$25 million loan. The loan was applied for partly to show how ITT would put money *into* the network rather than financially milking it, as some critics had suggested. In March the FCC reheard the issues and on June 22, 1967, approved the merger a second time, by the same split vote. But a month later the Justice Department appealed the matter to the courts. Faced with this further delay, ITT announced in January 1968 that it was canceling the merger agreement and would look elsewhere for acquisitions. Those who felt that ABC would have been forced to temper its news coverage of ITT's many connections were delighted. ABC was left back in third place among the networks. That summer, recluse billionaire Howard Hughes tried to buy controlling interest in ABC for \$150 million, but ABC management was not interested.

As hopes for the ITT merger died, ABC took its one innovative plunge in networking of this period—but in radio and not television. On January 1, 1968, it replaced the old ABC Radio Network with four separate networks: Personality (soon renamed Entertainment), Information, Contemporary, and American FM. Using the single ABC network line leased from AT&T, the four shared each broadcast hour in a set pattern, one network getting the first 15 minutes, the next network the second, and so forth. This kept costs down and, perhaps more important, made it possible for the FCC to apply an obscure section of the Chain Broadcasting rules of 1941. For the first time, networks were to be tailored to specialized station formats: talk stations could go to the Information network, Top-40 stations to Contemporary, middle-of-the-road to Entertainment, and FM stations to their own service. All the news could be identified as ABC News, and *each* network in a single market could have one affiliate. In a year ABC had twice as many radio affiliates as before the changeover, and soon more than 1,200 stations were assigned to one of the four networks, making ABC by far the largest radio network operation, with about 30 percent of all radio stations. Mutual, formerly the largest radio network, suffered from the competition in the smaller markets which it had controlled. It brought a law suit on the basis of alleged violation of the duopoly rule to enjoin ABC from the plan, but the suit was dismissed. That the Information network was, from the first, the largest of the four networks indicates the desire of stations for national news.

In 1972 Leonard Goldenson, the chief figure in ABC since the merger with Paramount Theaters in 1953, moved up to chairman of the parent company, and Elton Rule, manager of KABC-TV Los Angeles before his move to network head-

quarters in New York in the late 1960s, became president.

CBS had many changes in operating personnel. At the end of the quiz show scandals, CBS Television President Louis Cowan, who was closely identified with the genre, was eased out in favor of young executive James Aubrey. Aubrey ruled CBS with a steel hand early in the 1960s, earning the sobriquet “Smiling Cobra” for his cold-blooded decision-making, and was highly successful at first in selecting network programs. His sudden dismissal in February 1965 in favor of another former station manager, John Schneider, mystified the television world. Aubrey offered no explanation, and neither did CBS President Frank Stanton or Board Chairman William Paley. In general, Aubrey did not fit the CBS image of quality so dear to Paley and Stanton. Some of his programming decisions apparently were based on cronyism rather than judgment, and by 1965 their ratings were wearing thin. After leaving CBS, Aubrey moved to MGM to superintend its transition from a major movie studio to a firm handling hotel and other entertainment enterprises.

In 1973 Stanton, who by then was vice-chairman of the CBS board, retired on schedule (to run the American Red Cross), and the broadcasting industry lost its best single spokesman. Stanton would have liked, and expected, to move up to chairman, but Paley was not about to give up power in the corporation he had built. Stanton’s finest moment had come the year before, when CBS was attacked for its *Selling of the Pentagon* documentary (see 9.64) and Stanton had successfully stood up to the committee chairman seeking to cite him and CBS for contempt of Congress. Many regarded his defense of the network on First Amendment grounds as a capstone to a distinguished career. CBS went “outside” for his replacement—first to a

former ITT vice president, who died within a year of his appointment while Stanton was still available, and then in mid-1972 to thirty-seven-year-old Arthur Taylor. Like ABC, CBS was beginning to rely on younger executives although Paley was unwilling to give up overall control of his network. Apparently Taylor and Paley did not hit it off personally, for while the network was doing well financially late in 1976, Taylor was suddenly relieved of his duties. Named in his place was a man with no broadcasting experience, John D. Backe, who had headed up CBS's publishing arm. As Paley announced his withdrawal from day-to-day control of the firm in the spring of 1977, Backe was named Chief Executive Officer.

A highly successful company throughout this period, CBS began in the late 1960s to diversify its holdings. Although it could "beat" NBC in television ratings, it was a very small company compared to RCA. CBS Laboratories under Peter Goldmark developed important electronic devices, but CBS did not become a manufacturing concern. Instead, it purchased such diverse firms as Creative Playthings, Fender Guitars, and Holt, Rinehart and Winston and other publishing firms. CBS's strong artistic style and sense of image, credited to Stanton, showed in everything from the design of their new headquarters, to CBS stationery, to their television network programming (see 9.63).

At NBC, the retirement in 1969 and death in 1971 of long-time RCA head David Sarnoff, cut an important string to the past. His son Robert took over active direction of RCA until he suddenly was fired late in 1975. Economic reverses of the 1960s and 1970s caused the parent company to drop out of space and computer activities to concentrate on electronics. In the early 1970s RCA briefly tried to sell NBC's radio O & O stations together with the radio

network but could not find an acceptable buyer willing to take the package. In 1975 the NBC radio network replaced the long-running weekend *Monitor* with the first 7-day, 24-hour, live, all-news network service. The News and Information Service (NIS) would be available to any station, not just NBC affiliates, that cared to purchase it, and would run 50 minutes of each hour, leaving 10 minutes for NBC network or local news and features. An insufficient number of affiliates ended the venture early in 1977.

There was a serious attempt to form a fourth commercial television network in the mid-1960s. After the Dumont network collapsed in 1955, most observers claimed that too few major markets had a fourth commercial television channel to permit a successful fourth network. Kaiser Broadcasting, a group owner and operator of UHF stations, kept announcing that it would start a UHF-based network if it could get its O & O stations in the black (which it had not managed by 1977 when it sold out to Field Enterprises). Then in July 1966 Ohio warehouse owner Daniel Overmyer, who had several UHF construction permits, announced plans to launch a fourth network with an eight-hour nighttime service, including two of news and two of a live show from Las Vegas. With former ABC-TV president Oliver Treyz to head the operation, the Overmyer Network (ON) signed up 85 affiliates by fall and then appeared to drift while it sought more affiliates. In March 1967 ON became the United Network when a West Coast syndicate gained control, and in May the United Network went on the air with a two-hour program from Las Vegas fed to 125 stations with 13 advertisers defraying most of the costs. This effort collapsed after 31 days when the network was unable to pay AT&T line interconnection charges. Various attempts to restart the

network were made throughout the year, but none succeeded.

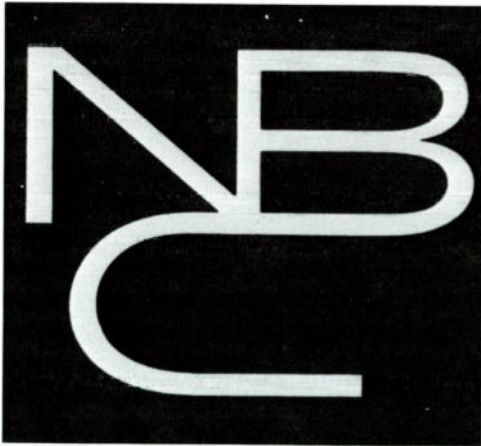
Several networks for special occasions were established. The most successful was the Sports Network purchased by Howard Hughes in late 1968 after his abortive attempt to purchase ABC. The Hughes Sports Network operated on a special program basis, with various station affiliates depending on the events it covered. UPI, AP, and Group W (Westinghouse) each offered audio news services to purchasers, and there were video (film) news services, but these were not networks in the generally accepted sense. Computer simulations suggested that a fourth or fifth commercial television network might succeed if more stations existed. But limitations on

funding and the low number of UHF or independent stations in major markets dictated otherwise, and these network dreams were shelved.

9•4 Educational Broadcasting Goes Public

Until 1967, educational radio and television developed differently from earlier years in one important respect: the number of broadcasting outlets increased each year. Although only a couple of dozen noncommercial AM stations remained, educational FM stations rose from 186 in 1961 to 291 in 1966 and 894 in 1977, nearly one-quarter of all FM stations, while ETV out-

Trials of Identifying a Network / A funny—to everyone but NBC—example of how bureaucratic and remote networks had become was the early 1976 announcement of a new logo for NBC television of a modern red and blue “N” to replace the “snake” in use since 1959. No sooner had it appeared on the network than the Nebraska educational television network advised NBC that it had been using an almost identical symbol, which cost them \$100, for six months. To save its investment of nearly a million dollars, including tens of thousands for the design itself, NBC gave the Nebraska network a sizable sum and some equipment—and got clear rights to the now even more expensive logotype. Photos courtesy of National Broadcasting Company, Inc.



lets doubled from 54 in 1961 to 108 in 1966 and again to 258 in 1977, more than one-quarter of all television stations. But the watchwords of these educational stations remained “local” and “inexpensive”; there was little national programming and very little money. The National Educational Television and Radio Center changed its name to National Educational Television (NET) in 1963 and eventually was providing up to ten hours a week of programming on film or tape. But, as Sydney Head has pointed out, “Despite remarkable progress, considering the odds, the course of educational television during the 1960s seemed dangerously parallel to that of educational radio—curving downward from a peak of high promise and fervent enthusiasm toward a plateau of mediocrity and neglect.”* Some important help had come in 1962 with the first federal grants, requiring 25 percent local matching funds, to educational television. The NAEB sponsored studies on the problems of educational broadcasting, usually arriving at the obvious conclusions that money and a national image were needed.

Funded primarily by the Ford Foundation, the Midwest Program on Airborne Television Instruction (MPATI) in 1961 revived the Stratovision notion (see 7.823). MPATI provided instructional television to schools in Indiana, most of Ohio and Illinois, and parts of Kentucky, Michigan, and Wisconsin from airborne transmitters on two UHF channels. Due to costs, scheduling problems, and the failure of some users to pay, MPATI finally sold its two airplanes and its transmitters in 1968, although it continued for a few years to produce and distribute programs on videotape.

*Sydney W. Head, *Broadcasting in America*, 3rd ed. (Boston: Houghton Mifflin Company, 1976), page 182.

A turnaround in the fortunes of ETV began in January 1967 with two important events. The first was the provision of several hours per week of interconnected live evening programming, with the Ford Foundation covering the interconnection costs. Later in the year NET, again with Ford Foundation backing, presented the *Public Broadcasting Laboratory*, a two-hour news and feature program on Sunday evenings. The first program included a one-hour drama by blacks in whiteface, which bored and puzzled many viewers and which many southern ETV stations did not carry. Between 1951 and 1977, the Ford Foundation pumped \$292 million into educational television stations, networks, and other operations.

The second, and most important, ETV event of 1967 was publication of the report of the Carnegie Commission on Educational Television, *Public Television: A Program for Action*. The commission had been established in 1965 by the Carnegie foundation. Its first decision was to distinguish between commercial television, entertainment for large or mass audiences; instructional television, generally in-class educational material; and public television, virtually everything else, with a large helping of public affairs, that was not supported by advertising. Among their final recommendations were (1) that a Corporation for Public Television be created to receive and disburse funds from government and other sources, (2) that it support at least two national and many more local production agencies, (3) that it seek ways to encourage interconnection of stations, and (4) that sufficient funds, not subject to the annual appropriation process, be provided through a 2 percent to 5 percent excise tax on television receivers.

This report sold 50,000 copies in a few days, received wide attention, and led

Carnegie Commission: The Creation of "Public Television" / The first few paragraphs of the Carnegie Commission's 12 recommendations (the key ones are noted in the adjacent text) suggest a substantial new role for public television:

The Carnegie Commission on Educational Television has reached the conclusion that a well-financed and well-directed educational television system, substantially larger and far more pervasive 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. This is the central conclusion of the Commission and all of its recommendations are designed accordingly.

The programs we conceive to be the essence of Public Television are in general not economic for commercial sponsorship, are not designed for the classroom, and are directed at audiences ranging from the tens of thousands to the occasional tens of millions. No such system now exists to serve us as model, and hence we have been obliged to develop a suitable new arrangement to bring this kind of television to the country. The Commission's proposal deals primarily with that new arrangement.

Although it provides for immediate assistance to existing stations, this is a proposal not for small adjustments or patchwork changes, but for a comprehensive system that will ultimately bring Public Television to all the people of the United States: a system that in its totality will become a new and fundamental institution in American culture.

This institution is different from any now in existence. It is not the educational television that we now know; it is not patterned after the commercial system or the British system or the Japanese system. In the course of our study, we examined all those and others: members of the staff visited Canada, England, Italy, Germany, and Sweden, and papers were commissioned on the Japanese and Russian systems. We found in many countries serious and skillful attempts to provide superior television programming, and in some countries highly successful attempts. But when such a system was successful it met the special needs of society in terms of that society's culture and tradition, and there was little or nothing we could expect to import. We propose an indigenous American system arising out of our own traditions and responsive to our own needs.

Source: Carnegie Commission on Educational Television, *Public Television: A Program for Action* (New York: Harper & Row, 1967), pages 3-4.

to rapid action. President Johnson specifically mentioned public television—a term that caught on rapidly over the objections of some commercial broadcasters—in his 1967 State of the Union address and shortly afterwards proposed legislation along the lines of the Carnegie proposals. Eight months later, in November, the Public Broadcasting Act of 1967 became law. It created a Corporation for Public Broadcasting (CPB), as radio had been added at the congressional hearings. Unfortunately, the new corporation had to compete with the rising fiscal priorities of the Vietnam War, with a new Republican administration, which soon conveyed disinterest in a national system of public television, and with disagreement among educators as to whether the public television system should be centralized or station based and funded.

CPB could not legally operate stations or engage in program production. From March 27, 1968, to June 30, 1976, it received \$376.2 million in income and gave out \$310.7 million in grants, awards, and programs; its first federal appropriation had been \$5 million in fiscal year 1969. CPB worked on four major areas of system development in its first months: grants to local stations with an immediate disbursement of \$10,000 to all stations and the understanding that future grants would apply to individual needs and plans; interconnection of public television stations; underwriting national programs; and national publicity and research for public television.

A key problem present from the beginning was to plague public broadcasting well into the 1970s. Upon approving CPB, Congress had appropriated a few million dollars in seed money, much of it for facilities rather than for programs, without providing for long-term financing. The Carnegie report had made clear

that isolation from the political process was crucial, and President Johnson had promised to furnish a long-range funding plan, which would permit CPB to plan ahead. He left office before this was done, and the Nixon administration, with its growing dislike for nationally oriented public television and unhappiness with what many Republicans perceived as excessive liberalism and independence in news and public affairs programming, dispensed annually a fraction of the recommended funds. This prevented long-range planning and hamstrung national development of public television. The problem was exacerbated as the Nixon administration, speaking through the Office of Telecommunications Policy (OTP; see 9.81), proposed funding directly to local stations instead of the centralized programming agencies. The local stations were eager to augment their woefully inadequate funds and pick and choose among the national programs. Many local stations reflected their conservative populations and the business community, which provided most local voluntary financial support; and giving them the power to determine what programs they would “buy” from program suppliers would encourage programming that was politically safe.

Early in 1969, PBS (Public Broadcasting Service) was added to the alphabet soup, to oversee the interconnection process, then mainly funded by the Ford Foundation, and other kinds of program distribution. It was not a program producer itself. It soon was controlled, however, by the station managers of public television stations, many of whom had long resented the national program monopoly of NET and were just as unhappy over the centralized funding power of CPB, which now supported them to a large extent. From its start, PBS got into a wrangle over the control of funds for

producing programs, which soon enveloped CPB, the stations, other program producers and supporters, and the Ford Foundation, until the OTP made it clear that federal funding under the Nixon administration would depend upon the system staying decentralized. Politically motivated bills appeared in Congress to ban programs on public affairs and news events on public television, using the reasoning that federal funds should not be used to support a governmental propaganda organ. Many congressmen objected to the high salaries of several on-air news people. Congress was nibbling around the edge, holding off funding until CPB would come around to the stations' and the administration's point of view. President Nixon vetoed a two-year funding bill, but a series of one-year authorizations for CPB passed. Congress was beginning to take an interest in public television (PTV), because substantial segments of the public had begun to watch.

PTV's adult audience increased to the point where some programs showed up in commercial rating service reports. Julia Child's *The French Chef*, produced over WGBH, Boston—one of the most prolific of the production centers for PTV, like KCET, Los Angeles; WNET, New York; and WTTW, Chicago—achieved great popularity. Perhaps most prominent were several British television programs, whose production and storytelling qualities far surpassed the run-of-the-mill commercial American situation comedies and adventure shows. The first of these was *The Forsyte Saga*, based on the Victorian-Edwardian novels of John Galsworthy. The 26 BBC-produced segments held audiences enthralled and increased listener donations. This was followed by *Masterpiece Theatre*, an all-inclusive title for other British series and mini-series produced by the BBC or the commercial IBA's programme

contractors, and hosted by English-American commentator and columnist Alistair Cooke. Some of these series dealt with historical subjects—*Elizabeth R* and *The Six Wives of Henry VIII*—but others dealt with less impressive subjects. *Upstairs, Downstairs*, to some extent a weekly soap opera but also social history, depicted life in a London town house in the early 1900s as seen by the family and its servants. This series won several American Emmy awards. Public stations also made heavy use of classic and foreign films. NET public affairs programs such as William F. Buckley's *Firing Line*, the debate program *The Advocates*, *Black Journal*, *The Banks and the Poor*, and *The Great American Dream Machine* brought audience attention and more controversy, including the displeasure of the Nixon administration and other conservatives. Essentially, public television was casting off its staid image and collecting larger and more varied audiences. Major companies frequently supplied funding for PTV series in exchange for a one-line credit: "*Masterpiece Theatre* is brought to you by a grant from Mobil Oil Corporation." These companies also often paid for newspaper advertising, which attracted larger audiences. Neither action was greeted with enthusiasm by commercial broadcasters.

In fall 1969, PTV took a giant step forward in children's programming with the first airing of *Sesame Street*. Planned since the formation of the Children's Television Workshop (CTW) early in 1968, with Ford and Carnegie foundation and U.S. Office of Education funding, *Sesame Street* was quite different from such traditional PTV children's programs as *The Friendly Giant* or *Mister Roger's Neighborhood* and commercial television's Saturday morning cartoons and adventure shows. It used modern commercial television techniques for education, having programs "spon-

sored" by different letters of the alphabet or numbers each day, having the show set on a city street, relying on very short animated cartoons with live and puppet segments, and breaking the show into many rapidly moving parts to keep the interest of preschool children. The show was an instant outstanding success, to the chagrin of the commercial networks that had turned down the idea before it had been offered to public television. *Sesame Street* was supported by a continuing research program, and changes were made in the format from time to time reflecting the results of that research. The CTW soon supplemented the preschool *Sesame Street* with *The Electric Company*, a half-hour program for older children that concentrated on words, spelling, and other concepts. CTW attempted an adult medical program using entertainment elements in 1974, but it was soon withdrawn for major changes and, even after drastic surgery, ran only briefly.

By early 1977, concern over the future of public broadcasting centered on two important sets of questions: how the expanding system was to be adequately financed, and how the increasing interorganizational squabbles (especially those between CPB and PBS) were to be resolved. The concerns and frustrations of both supporters and critics of public broadcasting came to a head in June with the announcement that a second Carnegie-supported commission would spend 18 months researching the status of and options for public television and radio, and would report its findings early in 1979.

9•5 Advertising Clutter and Consumerism

Perhaps more than in any other period of broadcasting's development, advertising itself was controversial. Adver-

tiser demand for air time continued to increase, while costs and public concern about advertising effects also rose.

9•51 Trends: Clutter

The major trend toward local radio advertising continued during these 15 years, with the proportion rising to 70 percent. Total radio revenues more than doubled, but inflation in the mid-1970s and the increased number of stations on the air hid the effects of that increase from the individual station. FM's advertising revenue position improved, but the industry remained in the red. While overall FM revenues rose from less than \$10 million to more than \$308.6 million between 1962 and 1975, many more stations reported losses than profits. FM's problems were the same as in previous decades: compared to AM, there were too little data, audience, station services. But with increased specialization and improved ratings for some FM stations, some of this old refrain wore down. Station owner Gordon McLendon, often an innovator, tried broadcasting nothing but classified ads on FM station KADS in Los Angeles in 1966–1967—no programs, just ads. This experiment was not successful, and KADS reverted to a "normal" musical format.

In television, full sponsorship nearly disappeared as participating or shared advertising spread through both daytime and prime-time hours. This change came fairly quickly; from the 1964–1965 season when only 48 percent of network ads were participating to 95 percent four seasons later. The long-standard one-minute commercial gave way to the 30-second spot. About 40 percent of spots were "30s" in 1964–1965; more than 80 percent four years later. Network advertising was so expensive that few advertisers could af-

ford the steady weekly costs of full sponsorship, or even many one-minute spots—and research showed that the 30-second spot sold goods and services almost as well at less—but not half—cost. Thus cost-spreading, shorter ads became popular throughout prime-time and daytime schedules. Unfortunately, their brevity resulted in a new pattern that audiences found irritating: the clustered or piggyback ad break. While the total time devoted to advertising did not increase, the number of commercial messages rose sharply as two 30s replaced one 60, or sometimes 20- and 10-second spots were strung together with 3-second quickies at station identification time. A prime-time viewer often would see four or five ads in a row in the middle of a program, and the (in)famous midnight break on the late night network shows sometimes ran three to five minutes of national and local ads, promos (promotional announcements), and station breaks in a row. A survey showed 30 different products presented in the typical daytime hour. The public was not the only complainer; advertisers, concerned that their 30-second message in the middle of such clutter would never stick in the viewer's mind, spent more effort and money on the design of commercials. By the late 1960s the most clever were getting "Clio" awards in annual industry self-recognition. Listeners also accused the stations or networks of playing the audio of commercials louder than the program—often a bum rap; really a case of *more* audio, electronically compressed, than *louder* sound. Devices, such as the "blab-off," that enabled viewers to cut audio had a brisk sale.

But clearly television was doing something right. In the 1961–1977 period, its share of all advertising rose from 13 percent to 18 percent and total revenues increased more than 343 percent. Local ad-

vertising became more important, rising from 15 percent to 24 percent of all television advertising. Non-network affiliated stations grew from 24 in 1961 to 97 in 1976 (see Appendix C, table 3).

During the late 1960s the practice of advertising discounts became a concern within the industry. For a long time stations and networks had provided volume discounts for major advertisers to encourage large buys of time over long periods. The network discount practice came under investigation by the Federal Trade Commission, the courts, and Congress in the late 1960s, not so much for the discounts as for the allegedly unfair market advantage they gave major companies, creating difficulties for new products and smaller companies. In 1960, an FTC case taken to court prohibited Procter & Gamble from retaining the recently acquired Clorox company. The court had based its decision largely on Procter & Gamble's eligibility for massive discounts, due to the volume of its multiproduct advertising on the networks, and the unfair discrimination this position might exert on its competitors in the bleach field. This precedent made everyone more cautious and conglomerate mergers less attractive. The problem began to work itself out during the 1960s for several reasons. First, discounts for participating advertising were far smaller than for full sponsorship. Second, as television became a cause of antitrust actions against advertisers, discounts sometimes were eliminated. Finally, the increasing demand for television time did away with the networks' need to offer advertisers massive discounts.

All of the above, plus inflation, led to steadily rising prices for advertising time. The typical network prime-time minute went from \$30,000 in the early 1960s to over \$100,000 by 1977. Special events, like the annual Super Bowl football game,

brought upwards of \$225,000 for each minute, although network costs for rights to the game also were huge. Television was not a medium for advertising by most small businesses.

9•52 *A Question of Fairness*

For most of the 1960s, the most acute broadcast advertising question was whether cigarette advertising would be banned and, by extension, whether the government had the right to ban the advertising of any legal product. The issue opened with the 1964 report of the Surgeon General, which declared, on the basis of scientific and statistical research, that cigarette smoking might be dangerous to the health of the smoker. In mid-1965, the FTC demanded that all cigarette advertising include a warning notice, a move blocked in Congress by tobacco-growing-state congressmen. Many critics saw the matter as one of fairness: since smoking cigarettes entailed controversy and public health, opposing views to cigarette commercials should be aired.

The first effective attempt to use this approach came late in 1966 when New York lawyer John Banzhaf requested WCBS-TV to provide some time for anti-smoking spots. When the station refused, he appealed directly to the FCC. Most observers expected the complaint to disappear in the sea of bureaucracy, but they were surprised. On June 2, 1967, the FCC decided that the Fairness Doctrine (see 9.82) did apply in this case, and that the public should hear the antismoking point of view. Informally, FCC General Counsel Henry Geller said that one antismoking spot for every three smoking commercials would be a fair proportion. The Court of Appeals in Washington upheld the FCC decision. Various governmental and vol-

untary health organizations made extremely creative spots and provided them to stations. Although the commission declared that the Surgeon General's report made this foray into commercial fairness unique, and thus not precedent-setting, advertisers, consumer advocates and environmentalists, and some lawyers were not so sure.

The increasingly active FTC and FCC proposed an outright ban on cigarette advertising on radio and television—the FTC wanted to include all media—and congressional hearings began to explore that idea. Broadcasters, alarmed because cigarette advertising accounted for about 10 percent of network advertising billings, offered many alternative plans, such as limiting ads to late evening and eliminating appeals to youth. Finally, under heavy pressure, the cigarette industry and the broadcasters split: the broadcasters suggested a four-year phaseout of cigarette advertising, and the cigarette people, concerned that FTC action might restrict them from other media, favored a quick and voluntary break with broadcast advertising. Indeed, if *all* tobacco companies were to drop television advertising at the same time, they could save a lot of money and no company would hold an advantage. They suggested termination in fall 1970 if broadcasters would forego contract provisions on canceled ads. The broadcasters—except for some who had voluntarily dropped tobacco advertising earlier—refused, and Congress then banned advertising by law.

After January 1, 1971—a date selected so that cigarettes could sponsor New Year's Day football bowl games one last time—no cigarette advertising would be allowed on radio or television. That last day was heavy with smoke, and during the late evening on January 1 tobacco company commercials filled the air as they

used their expensive spots for the last time. From that date, \$200 million in annual billings was lost to the broadcasters, who claimed the new law was unfair in that it did not affect the rival print media. They also pointed out that similar bans in other countries had done little to lower cigarette smoking. They apparently were right, but that made little difference. In fall 1973, Congress closed a loophole in the law by outlawing ads for "little cigars," which had been heavily advertised on the air during the previous year.

The cigarette matter was only the beginning of new FTC activity. Six months later, the FTC proposed an advertising claim substantiation program, whereby product makers would have to be able to support any and all claims made in print or broadcast advertisements. In broadcasting, this meant that erring sponsors would have to make "corrective" ads and telecast them for a specified time to counteract misleading ad claims. The heavy use of broadcasting by large multiproduct advertisers, even with diminished discounts, led to antitrust actions. Early in 1972, the FTC proposed that the four major cereal makers be broken up because of their market control, achieved chiefly through television ads concentrated in children's weekend programming.

This activity came to a head in February 1972 when the FTC proposed to the FCC that broadcasters should provide air time for *counteradvertising* to balance the views of commercial sponsors. The FTC felt that, if necessary, free time should be offered. The FCC demurred. A few test spots were produced, using the donated talents of Burt Lancaster to speak against Bayer's claims for aspirin superiority and to remind drivers of a massive recall of recent model Chevrolets, but very few stations used them. Proponents of counter-

advertising said that it would enhance freedom of speech and that commercial advertisers, often notorious for false claims, should not have a monopoly on the publicly owned airwaves. Broadcasters and advertisers united against this idea, as might be expected, because counteradvertising would (and here comes a familiar claim!) "ruin the industry." They believed that advertisers faced with counterads on the air would leave broadcasting and go to print media, where no such threat waited. Proponents of counteradvertising noted that the antismoking spots of the late 1960s had not driven cigarette firms from the air; no one firm could afford to leave the field to others, and joint action would have violated antitrust laws. Broadcasters further claimed that arguments would fill the air and that free time was unfair to broadcasting since it did not affect other media. By 1977 it appeared unlikely that the counteradvertising concept would attain the force of law, although some stations accepted such advertising and law suits were started demanding such a right. The issue became one aspect of the battle for public access under the Fairness Doctrine (see 9.82), which included court suits against "misleading" ads.

9•6 Program Specialization and Cycles

Programming in both radio and television after 1960 was a matter of slow evolution of types, with program cycles of invention-imitation-decline being more important than any revolutionary change. A common phenomenon in broadcasting was rapid copying of any program approach that showed it could gain an audience.

9•61 *Radio Specialization*

Until the late 1960s, the trend in AM radio was toward increased specialization of formats. A new all-news format spread to a few of the largest markets in the 1960s. Their manpower requirements made all-news stations expensive, but they did very well in the ratings. Many more stations adopted all-talk formats that included, but did not depend on, news. Telephone call-in programs, discussions, interviews, news, and public affairs were the hallmarks of radio without music.

Stations continued to specialize in music, although the Top-40 station, together with what had been rock music, slowly changed its sound. It is difficult to summarize briefly the changes in music over 15 years, although these changes were directly reflected in radio. Music prior to 1964 changed little from that of the late 1950s; Top-40 formula radio persisted. But the music of the Beatles drastically changed the sound of popular music after 1964; and after the Vietnam War became an issue in 1965–1966, college students' folk music turned into songs of protest. Singers were identified as much with their cause as with their music, and emphasis shifted from "sound," music and beat, to an appreciation of lyrics. Judy Collins and others made great music—sometimes with serious messages. Because certain lyrics seemed to glorify drug usage, the FCC warned management that it should clearly understand lyrics before airing a number; licensees would be held responsible for glorification of illegal actions. Another change of the mid-1960s was the increasing presence of black popular music artists on the air. Where in the 1950s, whites had performed rhythm and blues, which had originated as black music, new black soloists and groups turned their rhythm and blues into

soul music. The center of this activity was Motown ("Motor town" = Detroit) Record Co., controlled by blacks, and having under contract a number of groups popular with both blacks and whites—notably Diana Ross and the Supremes. What became known as the *Detroit sound* of strong instrumental background to rhythmic music was reminiscent of the music of the 1950s.

Stations in the 1960s increasingly specialized in particular kinds of music. Some stations concentrated on programming music and other content by and for blacks, especially in the larger markets with sizable black populations, even though almost all licensees were white. Country and Western music spread from its southern home to the rest of the country, including the supposedly sophisticated Northeast. By the 1970s, every major market had at least one C & W operation. Other stations specialized in rock, the most popular; middle-of-the-road; "golden oldies."

Some stations appealed to even smaller specialized audiences—religious or ethnic groups, classical music fans, and listeners to a handful of listener-supported "underground" stations, such as those of the Pacifica Foundation, whose programming is too eclectic to categorize. As the fragmentation of audiences produced a fragmentation of advertising revenues, inexpensive and often automated formats became very desirable.

In May 1963 the FCC proposed that AM-FM operations in the same market and under the same ownership be required to program separately some of the time. This would reduce duplicated programming, which had characterized most FM stations since the late 1940s. The industry predictably claimed that any such action would harm FM by taking away popular programs. But the FCC was insis-

tent and issued a rule in July 1964 specifying that, in markets of 100,000 or more, such stations must offer separate programming at least half the time. There was considerable legal wrangling, and whole classes of stations were given delays of execution, but by 1967 most FM stations had come under the ruling. The rule was expanded to include smaller markets in the 1970s. The result was predictable: FM began to specialize as much as AM, and soon the air was filled with FM rock stations, FM Country and Western stations, as well as "progressive jazz" and the more traditional FM "beautiful music" and classical music stations. By the late 1960s the specialization had changed the decades-old idea that "FM is special," to the view that "FM is radio." An increasing number of receivers capable of receiving FM testified to the resulting audience appeal.

Nonmusical entertainment programming did not disappear. Catering to nostalgia buffs, returns of old radio drama and comedy programs appeared, first on stations appealing to college students in evening hours and then spreading to other stations for an hour or so a week at different hours of the day. In 1973, NBC began to broadcast repeats of *X-Minus-One*, a series of science fiction dramas from the early 1950s. Mutual offered several old shows, and a few specialty companies bought up broadcast rights to old series—*The Lone Ranger*, *The Shadow*, and some comedies—to syndicate them on tape to local stations. National Public Radio, the radio arm of CPB, funded several radio drama workshops, including one specializing in the use of stereo in radio drama. Beginning in 1974, CBS broadcast *Mystery Theater*, an hour-long original drama each night. Hosted by noted actor E. G. Marshall, the series provided the first network outlet for writing and acting talent in radio in more than two decades and was a success with

listeners and advertisers alike. A child-oriented *Adventure Theater* followed two years later.

"Old radio" sound of another sort was the fare of the "golden oldie" stations of the 1970s, which based their appeal on the replaying of hit music from the past—six months to a decade or two. These stations generally aimed at adults in the advertiser-desired ages between eighteen and thirty-five who had listened to this music on radio as teenagers.

9•62 *Economics of Television Programming*

The most obvious differences between television programs of 1961 and the 1970s were the addition of color and the virtual elimination of live programming, although tape—using live television studio techniques—largely supplanted film. Color had languished after its 1954 introduction by RCA because of receiver and studio cost and lack of support from the rest of the industry with investments in monochrome. Only RCA's subsidiary NBC had programmed much color, while CBS had only occasional color shows and ABC had none.

By fall 1965 all networks had gone to color; NBC announced that its prime-time schedule would be about 95 percent in color, CBS would produce half its programs in color, and ABC hoped to achieve 40 percent. Black-and-white television had reached nearly every home, and many sets purchased during the boom years were due for replacement. Color set quality had improved and prices had dropped. Advertisers and some far-seeing program packagers had been preparing commercials and programs in color for some time.

Surveys had shown that color caused increased viewing and more atten-

tion to commercials, and for a time stations broadcasting more color had a ratings edge. But the cost of that edge was heavy. It was estimated that the networks spent \$30 million to \$40 million to purchase color equipment and add the required graphics, costumes, sets, and so on. Station costs also were high, since color cameras cost three times as much as monochrome cameras. To go “full color” was prohibitively expensive for most stations, but it cost them little to carry network programs and not too many thousands of dollars more to show color film. Hence, during that first color season, 97 percent of the stations could carry network shows in color, 60 percent had color film and slide capacity, while only 15 percent could originate programs in color. The 1965–1967 period saw stations scrambling for color equipment—and for the money to pay for it. By January 1966, 70 percent of commercials were shot in color, and a year or so later monochrome commercial spots were rare, at least on a network. By December 1966, more color than black-and-white sets were being sold for the first time. Lower receiver prices led to more set production and importation and still lower prices. It was estimated that one-sixth of the nation’s homes had color by 1967, and three-quarters by 1976 (see Appendix C, table 9).

A major change in television programming’s source also was apparent. Prior to the quiz show scandals (see 8.63), advertisers and their agencies produced about one-third to one-quarter of network programming, package agencies or companies produced about 45 percent, and the networks themselves made up the difference—around 20 percent in typical years, much of it news. By the late 1960s and early 1970s, advertisers had almost disappeared as program producers, providing less than 3 percent of network shows, mostly daytime. Packers now produced 80 percent

of network programming and nearly all of prime time, although the networks often had a financial stake in the product. Programs produced by the networks themselves accounted for only 8 percent of a typical season’s programming. This change was due only partly to the outcry for tighter network control and responsibility after the quiz show scandals. The most important factor was cost: up to a million dollars for a one-hour pilot and perhaps two-thirds that sum for a half-hour program pilot by 1977. Regular program costs were up as well, from \$100,000 per hour in the early 1960s to more than \$300,000 for the same kind of show in mid-1977. With packaging, networks could control their daily programming patterns better than when advertising agencies controlled many productions. Advertisers were naturally more concerned with a single program than with an overall pattern, but the package agencies had to cater to network needs and demands.

In the 1950s, most programs had been live or on film. But by the mid- to late-1960s the development of videotape recording (see 8.12) did away with most live programs except news on the three networks and many local stations. Comedy and drama programs usually were shot on film so that syndication to smaller stations or overseas, which used different VTR standards, could help recoup costs. Tape often was used for music and variety programs, because its slightly sharper image and the pace permitted by “live” multicamera television practice gave it a more immediate look, and for talk programs and daytime serials, whose lower cost usually could be recouped in a single showing. In addition, of course, tape made use of existing, expensive television production facilities and could be shown without a delay for film processing.

Programs were running longer.

The 15-minute format disappeared, the 30-minute format remained for situation comedies, while 60-, 90-, and even 120-minute dramatic or special programs became fairly common. Once in a while, a network would present a special program lasting the entire evening. There were more and more news and entertainment special programs and feature movies on network television (see 9.63) that ran an hour or two—or longer. In order to hold viewers over normal program switching periods, a few of these longer programs avoided ending an act or segment on the half-hour.

Then there was the problem of reruns. In the days of live shows, there had been few program repeats, as shows either were produced year-round or had summer replacements. Beginning in the 1960s, filmed and taped programs began to offer progressively fewer original episodes and more reruns each year, until, by the mid-1970s, some series had reruns for more than half the year. Unemployment in talent and craft unions in Hollywood spearheaded pressure to change this situation. By 1972 the problem had attracted White House activity, since President Nixon not only had no love for the networks but had promised economic aid for the film workers in his home state of California. The Office of Telecommunications Policy, a White House agency, suggested that reruns cheated viewers and created much of the unemployment afflicting the movie industry. The networks replied that to reduce or eliminate reruns would cost so much that (1) they would have to program a heavier dose of inexpensive game and variety shows, (2) much program production would be forced out of the country to places with cheaper labor, and (3) reduced network profit ratios would mean fewer network news and public affairs programs, traditionally paid for by entertainment show profits. All of these would fur-

ther reduce employment in the program production studios. The issue died with tacit recognition that reruns probably would stay. Since audience research showed that the audience for a rerun often was almost as large as for the original showing, it was said that they did serve the public interest.

As the number of new programs in a given series in a year shrank from 39 to 26 or less, the use of *mini-series* with four to ten program episodes became attractive as *fill-ins* for canceled programs or as specials. This followed the British practice of making no more programs than could be made well, considering the long lead time for scripts and the fatiguing effect of a long-running series on performers and crew. The success of British mini-series on PBS (see 9.4) paved the way for their use on commercial television, as did the rapidity with which networks would “kill” a series that did not initially do well in the ratings. A number of novels were serialized in this way starting in 1976, including Alex Haley’s *Roots*, which achieved record ratings—as many as 80 million viewers—when it was aired for 12 hours over eight nights on ABC in January 1977.

Programming cycles became common by the early 1960s. Program types were invented, were imitated, and then declined. Some observers have suggested that after the early 1950s no new program types appeared—only adaptations of formats, stars, and producers. New ideas were quickly exploited and imitated; a new show was built on a minor character in an earlier show, or merely followed a similar line. A prime reason for these *spin-offs* was cost. As a popular program lasted through several seasons, its creative or *above-the-line* costs, covering talent, direction, script, and music, increased far faster than the technical or *below-the-line* costs, partly because stars demanded a larger piece of

a successful show. When the network could no longer make a profit on the cost per episode—although foreign sales and other factors had to be considered—it would cancel the show for a less expensive replacement as soon as ratings began to dip. Imitations of successful program types came in roughly three-year cycles, which helped this process along: there were periods for westerns, situation comedies, crime and detective, and action-adventure shows.

9•63 *Television Entertainment Formats*

The number of variety programs doubled after 1961 but then declined rapidly in the 1970s. Ed Sullivan finally left the CBS lineup in 1972, due to declining ratings and an aging audience, after a record run in his Sunday evening prime-time slot. Other shows, built around singers—Dean Martin, Andy Williams—or comedians—Carol Burnett, Flip Wilson—came on, but had nearly disappeared by 1977. Quiz and audience participation programs also nearly disappeared in the network evening hours, although they remained popular during the daytime and on local stations.

In 1961 NBC started a trend with *Saturday Night at the Movies*, playing fairly recent theatrical films in prime time. The ratings were so high that the other networks joined in. In 1967 prime-time movies played 12 hours a week on the networks and soon at least one network had one every night of the week. Films of all sorts—comedy, drama, musicals—were used; in the long run they were less expensive, better produced, and earned higher ratings than most comparable network series programs. Their popularity kept up until the 1975–1976 season.

For prime-time showing, the networks needed more films appropriate for television than Hollywood could provide. They had exhausted recent feature films—production was drastically less than pre-1948 output—and most older films were too overshadowed or too unimportant for further syndication. Again, NBC led the way to a solution with *World Premiere* in 1966, presenting “made for television” movies—90- or 120-minute films shot on a television schedule of days rather than months. The speeded-up shooting schedule kept costs down, still put more entertainment values into a program than most series offered, and often led to better ratings than regular series. Once again, the other networks followed suit; in the 1971–1972 seasons, 100 such films were shown on all three networks. They were not cheap—about \$400,000 for a 90-minute film in 1974—but when played twice, once as a rerun, they could recoup costs with good ratings and advertiser response. By the early 1970s, television films were doubling as series pilots or even as feature movies abroad. Earlier, when a pilot did not sell as a series, the half-hour or hour film had little sales appeal. But expanded to 90 or 120 minutes, such a pilot could be shown as a film, without a series sale, and its track record would contribute tremendously to its salability as a series.

Television comedy was consistently strong in prime-time network programming. Situation comedies were particularly prone to the cyclical spin-off process. The long-running *Andy Griffith Show*—a comedy about a rustic sheriff—began in the 1961–1962 season and ran on network and in reruns through the decade, eventually spinning off *Gomer Pyle* (about a naive Marine Corps recruit from Andy’s hometown), which in turn spun off *Mayberry R.F.D.* before CBS dropped rural programs in the early 1970s because

they appealed to too old an audience to attract advertisers. In the same category was the immensely popular *Beverly Hillbillies* (about a hillbilly family, suddenly oil-rich, moving to Beverly Hills but keeping their country ways and clothes). This 1962 program spun off *Petticoat Junction* and Eva Gabor, Eddie Albert, and Albert the pig in *Green Acres* (about rich city folks trying to make good in the country). Comedies of the mid-1960s featuring a monster, witch, or genie, included the long-running *Bewitched* (about a wife and her mother who were goodhearted witches), possibly the best of this lot; shows with talking cars or horses, and a program based on the weird cartoon characters of Charles Addams.

Some comedy shows stressed gimmick, some stressed plot, and many of the longest lasting featured a personality: Lucille Ball, Dick Van Dyke, and others. Van Dyke did not repeat the popular success of the award-winning *Dick Van Dyke Show* of the mid-1960s, but his co-star, Mary Tyler Moore, did. Her subsequent show—one of several successes packaged by her MTM Productions, under the leadership of her husband, Grant Tinker—was one of the few with a broadcasting milieu—a local television station's news department, *not* in Hollywood or New York.

The most important comedy program factory of the 1970s was Norman Lear and Bud Yorkin's Tandem Productions. They broke many barriers by adapting two successful British television program ideas, which became *All in the Family* (about "lovable bigot Archie Bunker" and family) and *Sanford and Son* (about a black junk dealer). *Family* spun off *Maude* (about a middle-aged liberated woman), *The Jeffersons* (about Archie Bunker's black neighbors who move to a new, mainly white neighborhood), and others. Their short run in 1975 of *Hot l Baltimore* (from the play about a sleazy hotel with a letter missing

from its sign), which depicted two homosexuals, several prostitutes, and numerous older people in a comic light, and their syndicated *Mary Hartman, Mary Hartman* (an adult soap opera spoof that the networks would not touch, although many local stations snapped it up, opening a new market for packagers and doing very well when scheduled against the late night news on other stations) showed that the barriers on subject matter were coming down. The change had been swift. As late as 1967, some socially and politically oriented skits in the Smothers Brothers' comedy-variety show contained language and topics that bothered the CBS continuity acceptance staff. Rising costs, slipped ratings, and alleged contract problems gave CBS the excuse to drop the program. The brothers sued CBS successfully but were not able to revive their show on a regular schedule until 1975 (on ABC). It was a dismal failure; their humor had been passed by as television and public taste changed.

A comedy program departing from the usual situation formula was *Rowan and Martin's Laugh-In*. Starting in January 1968 after some tryouts, it offered extremely rapid pacing, blackout comedy lines, a zany and inventive acting troupe of relative unknowns, and topical humor held together by comedians Dan Rowan and Dick Martin. It was reminiscent of the innovative Ernie Kovacs show of 1955–1956 and subsequent specials before Kovacs's death in a 1962 auto crash. Several programs tried unsuccessfully to imitate *Laugh-In's* format, including one that succumbed after a single showing to affiliates' complaints about its bad taste. *Laugh-In* itself folded in mid-1973.

The hours devoted to western action-adventure programs diminished after 1961, with none scheduled for the 1976–1977 season. Only two had very long and successful lives: *Bonanza*, which lasted

14 seasons, and *Gunsmoke*, which lasted for 20. A flurry of war programs marked the early 1960s, nearly all of which replayed World War II. Some played it straight, like *Combat* or *12 o'Clock High*, and some tried an odd comedy form like *Hogan's Heroes*, which took place in a German prison camp; but most disappeared with the heating up of the real Vietnam War.

The fantastic and tongue-in-cheek approach to action-adventure was best epitomized by *The Man from U.N.C.L.E.*, started in 1964, which showed intrepid agents of a mythical anticrime organization trying to outsmart a global underworld organization. It was a spoof on the popular "James Bond" spy films, and after a season or two it became more obviously comic. The bumbling spy reached new heights in the long-running *Get Smart* half-hour comedy, which first aired in 1965. Straight-faced television parodies of comic-strip character *Batman* and old radio character *The Green Hornet* on ABC created a short-lived student cult in 1966–1967. Fantastic but deadly serious was *Mission Impossible*, beginning in 1966 and going into syndication after 1972. It had a stock opening scene of the lead character retrieving from some out of the way place a cheap tape recorder which would "self-destruct in five seconds" after giving him instructions. Complicated mechanical and electronic gimmicks and plots were typical of this series, which ran for many years on the network and had healthy reruns and syndication.

A limited science fiction movement peaked after 1966 with *Star Trek*, which depicted the "five-year voyage of the Starship *Enterprise*" and her diverse and stereotyped crew, including a pointed-eared alien executive officer. The voyage lasted only three years on television, but the program plays in seemingly endless reruns. Its fans, known as "Trekkies,"

have created a cult, complete with annual conventions and the lobbying ability to force NASA to change the name of the first U.S. space shuttle to *Enterprise*. They still call for *Star Trek's* revival, since a later cartoon version did not satisfy their desire. None of the other science fiction shows—the childish *Lost in Space* or *The Invaders* or the British syndicated *Space: 1999* had the attraction or lasting power of *Star Trek*.

Crime and detective programs were prevalent in the early 1960s and the mid-1970s. General formats of these two periods were frequently similar. *The Lineup*, a late 1950s show about veteran San Francisco police officers, was followed in the 1970s by *Streets of San Francisco*; the successful New York-based police detective *Kojak* of the 1970s reminded many of the superbly done *Naked City* of 1959–1963. Not all crime detective shows could be repeated, however. After nearly a decade, *Perry Mason* left the network lineup in 1966; although it had highly profitable reruns and star Raymond Burr's *Ironside*, about a wheelchair-bound police chief, was another long-term success—a revival of *Perry Mason* in 1973 was unsuccessful. However, until the 1970s television seemed unable to handle the uncompromisingly realistic look at police work of former Los Angeles Police Sergeant Joseph Wambaugh's *Police Story*. Most crime and detective programs continued their potboiling emphasis on action rather than on character and depth. For obvious production and audience distribution reasons, most shows of the genre took place supposedly in New York City or California. Recently, the "good guys" were seen to lose occasionally, but familiar plot lines, themes, and characters remained, more so in the police and private detective programs than in lawyer-centered programs such as *The Defenders* (a 1960s program about a father-son team

defending unpopular causes) and a mid-1970s special and mini-series, *The Law*.

Between *Ben Casey* and *Dr. Kildare*, which started in 1961, and *Medical Center* and *Marcus Welby, M.D.* in the early 1970s, few medical programs had prime-time popularity, but hospitals, doctors, and their adventures and love lives never left the networks, particularly the daytime soap operas, which often drew on medical locales or themes. By the early 1970s, medical dramatic programming was dealing more and more with controversial themes—abortion, euthanasia, costs of medical service, malpractice—in starker portrayals of hospital personnel, medical problems, and human character.

Regularly scheduled dramatic pro-

grams with little action but deep thinking did not last. George C. Scott as a concerned social worker in *East Side, West Side* was well reviewed by critics but insufficiently watched by the public, which wanted entertainment rather than conscience. Later shows about state legislators, *Slattery's People*, and even a U.S. senator, *The Senator*, met the same fate. Serious drama was limited in the late 1960s to the occasional special. The only regular anthology dramas of this period were on public television, and most were British imports.

The rise in public consciousness of racial and ethnic minorities in society was making television programming more complicated. Falling ratings and com-

Talk, Talk, Talk . . . *Morning and Night* / Both *Today* and *Tonight* began in the 1950s, the brainstormings of then NBC president Pat Weaver. The *Today* show combined news and features for its early morning listeners—and in early programs the camera panned outside of the ground floor studio to show watching New Yorkers. The *Tonight* show has been hosted since 1962 by Johnny Carson, shown here with his announcer-foil Ed McMahon. Earlier hosts included Steve Allen and the mercurial Jack Paar (1957–1962). Photos courtesy of National Broadcasting Company, Inc.



plaints from Italian-American groups about the preponderance of villains with Italian names forced the popular *Untouchables* off the network. Even though names were carefully changed during the last year of the show, the protest had achieved a life of its own. Mexican-Americans had the same effect on the "Frito Bandito" commercial cartoon character and, by the early 1960s, black concern about the lily-whiteness of television shows and commercials was bearing fruit. Though some network shows had starred blacks in the 1950s and 1960s, none lasted until *I Spy* in 1965 combined white Robert Culp and black Bill Cosby as U.S. undercover agents. Their warm relationship and repartee as equals together with an awakening racial con-

sciousness helped bring on more programs with black stars. The first series of the 1960s with one black star was *Julia*, a comedy about a divorced black nurse. Although a breakthrough, it received criticism for being too middle-class. By the early 1970s, blacks were present in about one-third of all commercials and in many television shows. For a time, Flip Wilson's variety show won top ranking in the ratings. The color bar seemed broken.

In daytime hours, television drama consisted of reruns of situation comedies, soap operas, or quiz and other human-interest programs. All of these had low budgets and high profits, which often helped offset network losses from expensive, prime-time television programs. Soap op-



eras were thriving and expanding, with several becoming hour-long programs by 1976. Plot development remained lethargic, and differences between shows seemed slight except for *Dark Shadows*, telecast live with heavy gothic overtones, including a vampire. ABC briefly telecast *Peyton Place*, based on the best-selling novel, twice a week in prime time, but serials did not do well in the evening. In the early 1970s, although the serials maintained a certain decorum—no swearing, for example—they dealt increasingly directly with adultery, drugs, and other current controversies.

The game shows became a daytime staple, and for a time in the late 1960s they outrated the serials. Game programs had three basic formats: audience participation, panels—*Hollywood Squares*, for example, used entertainers or other “professionals” to participate in a quiz, often with scripted repartee—and human interest—or perhaps greed, as with *Let’s Make a Deal*, in which studio audience members tried to get as much money or goods as possible. Local television stations adapted many of these and also used short features like *Dialing for Dollars* as audience-building and advertising vehicles.

Talk programs now ran through the day on both network and local television. The magazine format of NBC’s morning *Today* program (see 7.63), built around news and features, had many local station midday imitations aimed mainly at housewives. NBC was unsuccessful with another daytime talk program, the lavish *Home* of the early 1950s. Many men and women stars hosted talk or variety hours. Among the few who made national reputations were Dinah Shore and Mike Douglas. He began a low-key talk and variety program for Westinghouse’s KYW, Philadelphia, in 1965 and had a syndicated solid hold on large daytime audiences a decade later. Merv Griffin had a similar show—in

content and in ratings—in some markets.

The late evening hours became the domain of Johnny Carson after the former daytime quiz show MC took over Jack Paar’s host job on the *Tonight* show in 1962. With band leader Skitch Henderson (and later “Doc” Severinsen), many guests, and announcer Ed McMahon, Carson expanded a late night, highly profitable institution on NBC that successfully and almost effortlessly fought off competing network programs with talk hosts such as Joey Bishop or Dick Cavett (ABC), or movies (ABC and CBS). NBC later followed the Carson success with *Tomorrow*, which started at 1 A.M. (Eastern time) and stretched the network operation to 20 hours a day.

Sports programming was a staple of weekend and some other daytime hours. The last of the pre-scripted television wrestling programs left major stations early in 1964. By then television had revitalized professional football as the development of videotape and videodisc “instant replay,” starting in 1963, greatly added to audience interest. New Year’s Day now belonged to football, much as Guy Lombardo and his orchestra was the expected harbinger of midnight on New Year’s Eve. After 1967 the annual January Super Bowl earned enormous ratings and advertiser per-minute charges. The popularity and pitfalls of sports programs were illustrated in 1969 when NBC cut the last few seconds of a game to start a special children’s program (*Heidi*) on time. In an unbelievable nine seconds, one team scored two touchdowns and won the game—but the enraged and frustrated television football fans saw none of it. The networks learned their lesson: stay with the sports coverage no matter how long the game might go. In 1975, as a result, a network stayed with a major game for 45 minutes into another children’s special—and was roasted by enraged and frustrated parents.

ABC was more innovative in sports than the other networks. Its *Monday Night Football*, beginning in 1969, brought in audiences not reached by normal entertainment programming on the other networks. Its *Wide World of Sports*, on the other hand, attracted many viewers not normally interested in sports. Coverage of the 1964, 1968, 1972, and 1976 Olympics showed television technical ingenuity at its best, as ABC provided detailed and well-narrated coverage, usually by ex-athletes. The 1972 event in Munich became a tragedy, with terrorist murder of Israeli athletes, and the sports-suddenly-turned-news team reported the story well. ABC's sports chief, Rooney Arledge, was promoted to head of ABC News in 1977. In an effort to catch up with ABC in ratings and prestige, NBC bid a nearly unbelievable \$85 million just for rights to air the 1980 Olympics.

As the popularity of sports programs became evident and all three commercial networks bid for the rights to sporting events, television revenues became as important as gate or box office receipts to the various clubs and leagues. Sports fans had long objected to club contracts that required television blackouts for the area in which a contest was being played, even when the seating was sold out. This practice was stopped in 1973 when federal legislation banned such blackouts for football games sold out three days in advance.

9•64 *Growing Independence of Television News*

For most of the 1960s, before and after evening network newscasts were lengthened from 15 minutes to a half-hour in September 1963, CBS's Walter Cronkite competed with the NBC team of

Chet Huntley and David Brinkley for audience, while ABC ran a series of newsmen through its anchorman slot. It found long-term success in 1970 when Harry Reasoner left CBS and joined Howard K. Smith, another ex-CBS correspondent, to create a team. However, the Smith-Reasoner team broke up in 1975, with Smith becoming a commentator, such as Eric Sevareid was at CBS until his 1977 retirement and Brinkley was at NBC, and Reasoner becoming sole anchorman. In 1976 ABC hired Barbara Walters from the NBC *Today* show to be co-anchor in a million-dollar deal. At NBC, with Huntley's retirement in 1971, the anchor position reverted to John Chancellor, a veteran NBC news correspondent and the head of the Voice of America from 1965 to 1967. During and after the 1976 political campaigns, NBC teamed Chancellor with Brinkley.

Daytime network newscasts also increased greatly during the late 1960s, partly under the pressure of news from Southeast Asia. Local stations frequently programmed more news than the networks, with short noontime programs, half-hour late evening shows, and up to an hour and a half adjoining the network news at the dinner hour. By 1976, the networks were running up trial balloons for increasing their evening newscasts to 45 or 60 minutes, against the strong opposition of their affiliates, who would lose revenue as a result.

Spurred by the need to cover events in other continents—the Vietnam War, the Olympics—broadcasting networks turned to space communication satellites. Although each satellite use cost several thousand dollars, it permitted live coverage of some events and eliminated the complexities and red tape of air transport of film from overseas. Broadcast journalists also had, by the mid-1970s, a wide range of such electronic newsgathering

(ENG) equipment as portable color cameras and videotape recorders, whose flexibility and ability to deliver live pictures led many television stations to replace their newsfilm equipment with a true television system.

A watershed of American history and of broadcast journalism occurred a few months after the networks lengthened their evening newscasts to a half-hour. Almost everyone old enough to remember can tell you exactly where he or she was on November 22, 1963, when the news came of President Kennedy's assassination in Dallas. The authors of this book both happened to be standing by UPI teletype machines, one in Madison, Wisconsin, and the other in Los Angeles. Although radio

could respond immediately, the television networks had to take a few minutes to warm up cameras, insert a few hasty words into the normal programming, and switch over to four extraordinary days of news, commentary, and tribute. Although broadcasters, like the rest of the nation, were in shock, they somehow solved the logistic problems and produced the necessary pictures: preparations for the funeral, the first hours of the Johnson administration, varied tributes, the further shock of Jack Ruby shooting alleged assassin Lee Harvey Oswald, telecast live on NBC, and finally the almost unbearable emotion of the funeral and burial at Arlington National Cemetery. For all four days Americans remained glued to their

And now . . . the evening news with . . . / Since 1963, the CBS evening news has been anchored by Walter Cronkite. A UP reporter until after World War II, Cronkite became one of the most trusted men in America. Although well known for his interest in the space program of the 1960s, his influence was most visible after he became a "dove" on the Vietnam war following a lengthy visit to Saigon. The photo here shows Cronkite in the 1960s. His chief competitor was the NBC team of Chet Huntley and David Brinkley (see picture on the first page of Chapter 8) from 1956 to 1971, then John Chancellor for several years. During and after the 1976 elections Chancellor and Brinkley teamed together—and are shown here in the network booth above the floor of the Democratic convention that nominated Jimmy Carter for President.

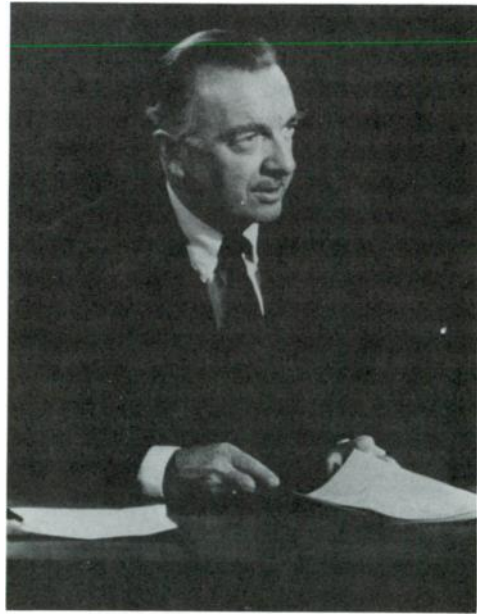


Photo credit: Indelible, Inc.

sets. CBS research showed 93 percent of the nation's homes tuned in during the burial, and the average home having a set in use for more than 13 consecutive hours. By the end of these four days, broadcasters could stand down from a job well done and commiserate with the rest of the country about the senseless assassination and the terrible feeling of loss—not just of a President but of purpose and enthusiasm.

Unfortunately, the shooting in Dallas was but the first of a series of political assassinations and attempted assassinations. In April 1968 television covered riots that broke out in black ghettos all over the country after Martin Luther King, Jr.'s assassination in Memphis. Two months later, Senator Robert Kennedy was

killed on the night of his California presidential primary victory. Live television did not catch the shooting itself—late at night in Los Angeles—but the networks stayed on the air to report the senator's condition and eventual death in a hospital. For both Kennedy funerals, television was an integral part of impressive and symbol-laden ceremony. Through television, as it followed the train carrying the senator's body from New York to Washington, millions of Americans, whether political supporters or foes of Kennedy, joined vicariously with the hundreds of thousands who lined the tracks. Watching these events helped to achieve catharsis. The 1972 election process was similarly marred when a man shot Alabama Governor George Wallace



Photo courtesy of National Broadcasting Company, Inc.

at a rally. Television cameras covered the shooting and, in subsequent years, permitted the paralyzed Wallace to present his political message to the public. The horror of assassination loomed again in fall 1975 when attempts were made in California on the life of President Gerald Ford.

Some of the most exciting positive moments on television occurred in the "space race" of the 1960s with the Russians, after President Kennedy promised to put a man on the moon within the decade. Even the manned suborbital flights of 1961 were exciting when all that the viewer could see was the blastoff. With John Glenn's first orbital trip in February 1962, the nation hung on every minute of the several hours of coverage, although it was

largely in the studio, with mockups and animation and interviews. In May 1963 Gordon Cooper used live television from space to show us what Earth looked like from orbit. Television covered the first space walk in 1965, showed the Gemini recovery live later that same year, and covered the disastrous flash fire in January 1967 that killed three Apollo astronauts about to make the first flight of their three-man spacecraft. On Christmas Eve the mission commander of Apollo 8 read passages from Genesis on live television while the spacecraft orbited the moon and we got our first closeup of the moon's surface. Seven months later, Apollo 11 placed man on the surface of the moon itself. All the networks geared up with science report-

CBS News Covers Man's First Landing on the Moon: July 1969 / Sunday, July 20, 1969, about 4 P.M. (EDT). The three national television networks have scrapped normal program schedules to cover the initial moon landing by Astronauts Neil Armstrong and Edwin Aldrin on the Apollo 11 mission. Here is how CBS's Walter Cronkite, assisted by former Astronaut Walter Shirra, reported the landing. (*Houston* is the Manned Spaceflight Center at Houston, Texas; *Capcom* is the capsule communicator at Cape Kennedy; *Eagle* is the landing craft; *Tranquility Base* was the name used by *Eagle* after the landing.)

Capcom: Eagle, you're looking great, coming up on nine minutes. We're now in the approach phase, everything looking good. Altitude 5200 feet.

Cronkite: 5200 feet. Less than a mile from the moon's surface.

Eagle: Manual altitude control is good.

Capcom: Roger. We copy. Altitude 4200 and you're go for landing. Over.

Eagle: Roger, understand. Go for landing. 3000 feet. Second alarm.

Cronkite: 3000 feet. Um-hmmm.

Eagle: Roger. 1201 alarm. We're go. Hang tight. We're go. 2000 feet. 2000 feet, into the AGS. 47 degrees.

Cronkite: These are space communications, simply for readout purposes.

Capcom: Eagle looking great. You're go.

Houston: Altitude 1600. 1400 feet. Still looking very good.

Cronkite: They've got a good look at their site now. This is their time. They're going to make a decision.

Eagle: 35 degrees. 35 degrees. 750, coming down at 23. 700 feet, 21 down. 33 degrees.

Schirra: Oh, the data is coming in beautifully.

Eagle: 600 feet, down at 19. 540 feet down at 30—down at 15...400 feet down at 9...8 forward...350 feet down at 4...300 feet, down 3½...47

ers, ex-astronauts, explanatory animation, and models to explain the lengthy and complicated mission from liftoff to splashdown. On July 20, 1969, at 4:17 P.M. (EDT), the lunar module landed on the moon and even normally restrained CBS anchorman Walter Cronkite could not contain his joy. At 10:56 P.M., Neil Armstrong became the first man to walk on the moon, and a small television camera covered the event live for Americans and millions of others who watched via satellite relay. For the next hours the world watched while the astronauts wandered over the surface, talked by telephone with the President, planted the American flag, and cavorted and worked. There also were live telecasts from the returning spacecraft, and live coverage

of the splashdown and delivery of the astronauts to a germ-proof quarantine station.

Color television added great visual interest to later missions. The most suspenseful flight was that of Apollo 13, which aborted on the way to the moon because of a fuel cell explosion. Television kept the nation informed of emergency procedures to bring the crew safely home. Some viewers complained that space coverage was overdone, even during the Apollo 11 and Apollo 13 missions—they missed their favorite programs or resented the public relations exposure for the space program—but most viewers, judging from the ratings, were fascinated by every minute of it.

Television also provided momen-

forward...1½ down...70...got the shadow out there...50, down at 2½, 19 forward...altitude-velocity lights...3½ down...220 feet...13 forward...11 forward, coming down nicely...200 feet, 4½ down...5½ down...160, 6½ down...5½ down, 9 forward...5 percent...quantity light 75 feet. Things still looking good, down a half...6 forward...lights on...down 2½...forward...40 feet, down 2½, kicking up some dust...30 feet, 2½ down...faint shadow...4 forward...drifting to the right a little...6...drifting right...

Cronkite: *Boy, what a day.*

Capcom: 30 seconds.

Eagle: Contact light. O.K. engine stopped...descent engine command override off...

Schirra: *We're home!*

Cronkite: *Man on the moon!*

Eagle: Houston, Tranquility Base here. The Eagle has landed!

Capcom: Roger, Tranquility. We copy you on the ground. You've got a bunch of guys about to turn blue. We're breathing again. Thanks a lot.

Tranquility: Thank you.

Cronkite: *Oh, boy!*

Capcom: You're looking good here.

Cronkite: *Whew! Boy!*

Schirra: *I've been saying them all under my breath. That is really something. I'd love to be aboard.*

Cronkite: *I know. We've been wondering what Neil Armstrong and Aldrin would say when they set foot on the moon, which comes a little bit later now. Just to hear them do it. Absolutely with dry mouths.*

Capcom: Roger, Eagle. And you're stay for T-1. Over. You're stay for T-1...

Tranquility: Roger. We're stay for T-1.

Capcom: Roger. And we see you getting the ox.

Cronkite: *That's a great simulation that we see here.*

Schirra: *That little fly-speck is supposed to be the LM.*

Cronkite: *They must be in perfect condition...upright, and there's no complaint about their position.*

Schirra: *Just a little dust.*

Cronkite: *Boy! There they sit on the moon! Just exactly nominal wasn't it...on green with the flight plan, all the way down. Man finally is standing on the surface of the moon. My golly!*

Capcom: Roger, we read you Columbia. He has landed. Tranquility Base. Eagle is at Tranquility. Over.

Source: 10:56:20 PM EDT 7/20/69 (New York: CBS Television News, 1970), pages 76–78. © 1970 CBS, Inc. By permission.

tum for the civil rights movement of the 1960s, in news reports, documentaries, and other programming. It also covered—and some would say caused or at least abetted—much of the urban racial and campus political and social unrest of the mid-1960s. In August 1965 television cameras covered the burning and looting by residents of large parts of the Los Angeles black community of Watts. A helicopter-borne KTLA camera provided amazing coverage, but television crews also went into the ghetto—many for the first time, residents complained—only to discover that they, too were targets for frustration and rage. Riots in other cities, notably Washington, D.C., also occurred during this “long, hot summer.” Some blamed the riots on unfulfilled expectations of blacks who had swallowed television’s glamorized version of upper-middle-class white life. By the time of the massive riots in 1968 in Washington, Philadelphia, and other cities following Martin Luther King, Jr.’s assassination, broadcasters had learned what *not* to do. News teams, in addition to feeling like targets, had frequently encouraged violent, or more violent, action or confrontation simply by showing up at a protest with cameras and lights; and persons or groups who wanted to publicize their cause often alerted the news media to potential clashes.

After the racial conflict, the most important violence and protest that persisted in this period was the war in Vietnam. Beginning with coverage of American “advisers” participating in small unit actions in the early 1960s, the nightly evening newscasts brought to millions of American homes the “living room war”—day-to-day life and death in battle. For more than seven years, families sat down to dinner in front of the television set and watched Americans and Asians shooting and being shot in the longest war in our history. It was a war of small actions, and

this is what television and cameramen, anxious to make their marks as Murrow, Severeid, and others had done in an earlier war, showed best. Critics contended that television’s incomplete, piecemeal coverage had converted many Americans from a prowar or “hawk,” or neutral, stand to an antiwar or “dove” stand during or after the early 1968 Vietcong and North Vietnamese Tet offensive. Coverage of peace marches on Washington and other such demonstrations by an expanding group of Americans led many to support this cause. Unrest on many campuses was strong, partly due to the war and partly due to Vietnam-related policies and politics. Starting at Berkeley and spreading rapidly to Columbia, Wisconsin, and other campuses, the climax of this movement was the killing by Ohio National Guardsmen in early 1970 of four students during a protest at Kent State University.

Many television reporters who went to Vietnam—and most did—came away feeling that the United States was backing a string of dictatorships, that the war was morally wrong, and that it was being mishandled. ABC for several years offered a documentary overview of the week’s events in Vietnam, but most other network coverage was restricted to evening newscasts and occasional special documentaries. Although reporters claimed that military control of their reporting, especially in countries like Thailand and Cambodia, made it difficult to get and transmit a true picture of what was happening, no previous war has been so accessible to reporters. The lazy reported the war from Saigon by relying on the military briefings known locally as the “Five o’Clock Follies”; the brave, ambitious, or foolhardy went out on combat patrols, where a number of them were killed or listed as missing. But there was little depth to the coverage. It is an unanswered question

whether the steady coverage of wartime violence deadened Americans to reality or whether the reporting showed the forest behind the trees and changed American thinking. It is too early to conclude more than that television *did* play an important part in its first war.

Television news and documentary units, especially those of CBS and NBC, were taking on increasingly tough subjects and saying something of value or importance about them. But controversy surrounding the television documentary was increasing. The 1960s began with the last of Edward R. Murrow's documentaries, *Harvest of Shame*, dealing with problems of migrant farm workers. When Murrow later was serving as head of USIA for President Kennedy, he tried to suppress export of the program, but to no avail and much criticism. Programs such as *Biography of a Bookie Joint*, with films of gambling operations going on without police intervention and *Battle of Newburgh* (about a town that cut off funds for many welfare recipients) led to public outcry and threats of legal action against the network responsible. Howard K. Smith's ABC documentary on *The Political Obituary of Richard Nixon*, just after Nixon lost the California gubernatorial election in 1962, raised sparks when Alger Hiss gave his views on his old tormenter. (Nixon, as a congressman, had been instrumental in sending former State Department official Hiss to jail for perjury for denying that he had been a communist agent.) Nixon supporters and other complainants and victims accused television of political bias and unfair reporting. CBS got into trouble with its "Pot Party at a University" segment of a Chicago local news show when it became known that the event had been set up for the cameras. Not only was the use of marijuana illegal but news "created" by the broadcaster was, at best, misleading to the public.

Perhaps the biggest complaint and even a congressional hearing resulted from CBS's 1971 telecast of *Selling of the Pentagon*, a hard-hitting discussion of military public relations, which questioned spending large amounts of tax money in this way. The documentary angered conservative congressmen, many of whom admitted they had not seen the program, and they engineered a full-scale hearing on documentary practice, film splicing, editing of shows, and *out-takes* (unused film material). CBS refused to supply any materials not actually aired on the program, contending that such action would violate First Amendment freedoms and stifle all investigative reporting. An attempt to cite CBS and president Frank Stanton for contempt of Congress failed in what most broadcasters regarded as a victory. But several important points had been raised, and some documentary production methods were changed and controls of viewpoint tightened. What seemed acceptable and normal to a documentary maker might not appear so to a concerned viewer. Prior to 1964, the networks themselves had produced all news and news documentary programs. In 1963, ABC opened the door to other producers a bit by showing the David Wolper production of *Making of the President: 1960*. As television became the most commonly used and trusted source of information by the American public, its responsibilities increased.

The networks' news coverage received the strongest—generally politically inspired and planned—criticisms in the very late 1960s and early 1970s. In a televised speech to a Republican group in Iowa in fall 1969, Vice President Spiro T. Agnew complained that three major networks had a stranglehold on the nation's news and thinking. He asked rhetorically who had selected the small group of network officials, editors, and anchormen who made

news decisions. A week later he offered another complaint, and soon similar remarks from other politicians joined in a well-orchestrated campaign and safety valve for long-standing resentments. The broadcast industry responded with its usual defensiveness, emphasizing the dangers of governmental control of news. Agnew's comments ostensibly had been sparked by the network practice of commenting on a presidential speech immediately—what he called “instant analysis.” That the networks usually had copies of presidential speeches to study hours in advance did not placate those who believed that the President should not be interpreted in this way. For a time in 1970–1971, CBS eliminated any post-speech analysis. Many local stations joined in the clamor over network news control. They either had different political viewpoints, station owners frequently being more conservative than network news officials in New York and Washington, or wanted to avoid controversy that might interfere with sales of advertising time. The months-long confrontation, part of the Nixon administration's battle with a more or less independent center of information and power, the press, was useful in many ways. Broadcasters had to consider their own actions and practices, explain them, tighten up sloppy practices, and improve their professionalism. Viewers had been directly exposed to critically important differences between government and media, and government and media both had re-evaluated their roles and assumptions. These struggles between media and government, including the release of the “Pentagon Papers” and the resulting legal clash between the *New York Times* and the government, and further disillusionment over Vietnam culminated in the biggest domestic news event in decades: Watergate.

Television did not play a strong

role for the first year of the Watergate scandal of 1972–1974, which started with a “third rate burglary” and ended with the resignation of President Nixon. From discovery of the burglars in the Democratic Party offices in June 1972 through the election the following November, most investigative research was by the printed press, notably the *Washington Post*. Television stories and special programs became more common in 1973, but television's greatest value was its coverage of the Senate Watergate Committee hearings. Running from May through August 1973, and chaired by North Carolina's crusty Sam Ervin, these hearings were a fascinating live exposition of the political process in America, and were “must” television watching as a parade of witnesses told—or evaded telling—what they knew of the broad conspiracy to assure the re-election of Nixon and then to cover up the conspiracy itself. The members of the Senate committee soon became household names and faces, as the various witnesses supplied their pieces of the puzzle. For a time, the networks alternated coverage so that they and the viewers would have a choice between the hearings and regular entertainment programming. The more the viewers watched the hearings the more important the Watergate issues became in national affairs.

Newscasts and special news programs punctuated the course of the tottering administration. In October 1973 Vice President Spiro Agnew had to resign because of his acceptance of kickbacks when he was a Maryland official. Shortly afterwards, when Nixon tried to fire the special prosecutor investigating Watergate, the “Saturday Night Massacre” led to the resignation of Attorney General Richardson and other officials and the eventual firing of the special prosecutor. The story built. Nixon professed inno-

cence of the coverup, gave edited tape transcripts of his White House conversations to Congress—with the transcripts, in large binders, impressively piled behind him as he spoke on television. There were court battles over access to the tapes by Congress and by the new special prosecutor, arguments over a deleted 18½-minute portion of one tape, and further arguments over executive privilege and the right of Congress to subpoena the tapes. When the House Judiciary Committee in mid-1974 recommended impeachment, and the Supreme Court said that the President could not withhold the tapes, it was all over.

On August 8, 1974, television and radio presented President Nixon's resignation speech, as well as the swearing in of former Vice President Gerald Ford the next day—a change in power almost as sudden and poignant as that after the 1963 Kennedy tragedy. Although the broadcast media had been the bearer of bad tidings for a generation, and had been blamed, sometimes with justification, for causing unpleasant news, by the mid-1970s public understanding of journalism's role was far more realistic and the news media were far more professional.

9•65 *Election Broadcasting*

There were few changes in political campaign coverage in the 1964, 1968, and 1972 elections—but 1976 was different. The 1964 election fight between President Lyndon B. Johnson and Senator Barry Goldwater saw some of the strongest—some would say dirtiest—political ads ever aired. A Johnson spot intimated that Goldwater was likely to start an atomic war, and a Goldwater spot virtually accused Johnson of immorality. For election night, the networks and wire services joined to-

gether for the first time to coordinate reporting of election returns. The resulting Network Election Service (later, News Election Service) was to become permanent. The networks each took nine states, and the wire services split the rest. Although all “raw vote” tabulations were now common to all media, each network still used its own sample areas and computerized prediction techniques for forecasting or “declaring” winners—sometimes before polls closed in western states. This caused such an outcry that the networks had to delay “declarations” until the last polls had closed, although surveys commissioned by the networks indicated this action was not warranted.

The 1968 election was most notable for the debacle outside the Democratic convention in Chicago. Mayor Richard Daley tightly controlled the city and the location of cameras by the networks. It was not enough. When his police and the youthful antiwar and antiestablishment demonstrators clashed in front of the convention hotels several nights running, home viewers were treated to the dichotomy of calm inside the hall and riots outside. Several reporters were arrested or roughed up inside the hall as well as outside, as the Daley forces sought to retain control. There were bitter post-convention attacks that television had biased viewers by covering the riots while neglecting the scheduled convention events. The networks replied that both were news events worthy of coverage. Daley supporters also claimed that the presence of the television cameras stimulated the rioting. The entire event was a prime hunting ground for researchers, as the 1938 “War of the Worlds” broadcast, the Kate Smith War Bond drive, the “Great Debates” of 1960, and the J. F. Kennedy assassination had been earlier. People interpreted the events in Chicago in different ways: some believed that the

demonstrators' language had provoked the police, others condemned a "police riot." In either event, the Democratic candidate for President, Vice President Hubert Humphrey, lost votes at the polls that November.

Convention coverage differed from previous years. ABC did away with its daytime and evening-long gavel-to-gavel coverage and concentrated its report into the late evening hours. ABC thus gained a ratings advantage by preserving its entertainment programs and gathering some political watchers later on.¹⁷

The 1968 campaign and the off-year elections of 1970 brought the talents of the professional image-makers fully into focus. Joe McGinniss' devastating *The Selling of the President 1968* exposed the media campaign behind Nixon, and many other candidates were accused of having been packaged and sold like consumer goods. Debate raged over the effects of television and other media usage, and experts analyzed the massive amounts of money that had been spent in the past in mass media in attempts to persuade or even "buy" voters. By 1972, however, it was clear that television and image-building alone would not do the trick, and the image merchants lost some of their glamour and appeal. Expenditures on radio and television in the 1972 campaign, however, came to \$60 million as compared to only \$14 million spent on broadcasting in the 1960 race. Nixon, whose Committee to Reelect the President (CREEP) greatly outspent Democratic candidate Senator George McGovern, won by a landslide. As a result, a new federal law was passed that would crimp the costs and style of campaigns after 1972. Broadcasters declared this law was unfair to their media, but it seemed politically unlikely that the free-wheeling campaign spending of pre-Watergate years would return.

The 1976 election campaign featured an old wrinkle—the "great debate" format pioneered in 1960 (see 8.64). Late in 1975, in response to a petition from the Aspen Institute's Program on Communication and Society, the FCC revised its perception of Section 315. The "Aspen ruling" held that debates and other coverage of candidates would be exempt from the equal opportunities provisions of the law if such political events were arranged by groups other than the candidates or the broadcasters, and if that broadcast coverage was "incidental" to the event taking place. Operating under what many thought of as a subterfuge, the League of Women Voters held a series of debates, during the spring primaries, among the many Democratic contenders for the 1976 nomination. Gerald Ford, in accepting the GOP nomination in August (after a tightly fought battle with former California Governor Ronald Reagan), challenged the Democrat's Governor Jimmy Carter to a series of debates—an unusual action for a sitting President, but taken because Ford was then far behind in the polls and was a bit unsure of himself, never having run in a presidential campaign before. There eventually were three debates between the presidential candidates, plus one (this was a new turn) between the vice-presidential candidates, Senators Walter Mondale and Robert Dole. As in the 1960 debates, when Nixon's appearance in the first debate cost him heavily, so did the debates affect the 1976 campaign. In the second debate, President Ford asserted quite clearly, and repeated when questioned, that Eastern Europe was not under Soviet domination. His campaign lost 10 days in trying to explain that statement away, and the lost momentum likely cost him the election. Carter had appeared weak in the first debate (which had its audio cut off the air for

28 minutes due to a technical failure), but Ford's error in the second appeared to have greater impact in the end. Carter won the election. The 1976 elections were the first to be heavily covered using flexible ENG equipment, at both national and local levels.

9·7 Audience Ratings and Research

As much as the 1950s had been depicted as the Age of Television, it was not until the 1960s that we began to determine how television was affecting us. Much research centered on the effects of television on children and youth, but there also was concern over its broader consequences.

Radio was in 96 percent and television in 90 percent of American homes at the beginning of this period, so growth in number of television homes slowed although the number of sets increased as people bought their second and third receivers. Three-quarters of American homes had color sets by 1976. Transistors made radio and television sets smaller and lighter, and more and more sets were imported each year, first from Germany and then increasingly from the Far East (to the extent that Japan and the United States signed an agreement in 1977 to limit Japanese color television set export to the United States). By the late 1960s, largely due to the labor economies of manufacturing abroad, virtually no radio receivers and very few black-and-white television receivers were manufactured in the United States, although U.S. firms had some foreign plants. In 1961, only 70 percent of cars had radios, but by the mid-1970s nearly 90 percent had, a substantial minority had added short-range transceivers in the Cit-

izens Band, and even more had FM. Digital clock radios were popular in the 1970s, and very tiny transistor radios could be bought for as little as \$5, with novelties—radios built into earphones or toilet paper holders—easily made.

Most homes of the early 1960s did not have the ability to receive UHF telecasts (see 8.81) and therefore UHF stations could not compete adequately with VHF stations in the same market. But in July 1961 the FCC proposed requiring all television sets be able to receive all channels. Congress approved the proposal in return for the commission's dropping all consideration of deintermixture (see 8.81), and President Kennedy signed the bill in July 1962, to take effect in mid-1964. Thanks to the steady market in portable and, after 1965, color television, the proportion of homes capable of receiving UHF broadcasts increased sharply from about 10 percent in 1961 to 90 percent in 1976. This act finally brought the UHF stations into the club, even though UHF tuners did not measure up to VHF tuners in quality in the same set until the manufacturers were pushed by the FCC in the late 1970s. The all-channel act was not the whole answer, but it helped immensely.

Noting the success of television's all-channel bill, those concerned with FM radio's lack of financial success tried but failed to get a bill passed that would require AM and FM capability in all radio, including automobile receivers. The cost differential and manufacturer-dealer indifference held automobile FM radio sales down in the 1960s, preventing FM stations from cashing in on AM radio's big audiences in morning and evening drive time. By the early 1970s, FM saturation was about 60 percent compared to UHF's almost nonexistent capability when the 1962 all-channel television bill was being considered—

thus reducing the need for all-channel radio legislation.

9•71 *Viewing Trends and Ratings Problems*

By 1961, 89 percent of the nation's families had a television set—47.2 million families. By late 1976, 97 percent owned television, but that small percentage increase covered a growth of more than 22 million families as the population rose. Thanks largely to the coming of color in the mid-1960s, retention of first-generation sets, and the relatively low cost of black-and-white portables, the proportion of multiset homes rose from 13 percent in 1961 to more than 45 percent by 1977. This is a far cry from the corner tavern announcing with great excitement in the late 1940s: "We have television!"

The basic pattern of television viewing remained as it had in the 1950s: Viewing was higher in winter than in summer and peaked between 8 p.m. and 10 p.m. Color-set owners viewed about seven hours a week more television than monochrome-set owners. Average daily household viewing slowly increased from about five hours in 1961 to about 6¼ hours in 1976. Roper (1977) has collected data for TIO that shows median individual viewing rose from 2:17 in 1961 to 2:53 in 1976. Naturally, families with children made heavier use of the set, and overall viewing decreased somewhat as education and income increased; to 2:24 for the college educated and 2:40 for individuals in upper economic brackets. Women did the most viewing and teenagers the least, while persons over 55 of either sex did the most viewing of all.

Viewership information, constantly updated, was generated by the two chief national ratings firms: the A. C. Niel-

sen Company, which had dominated national television ratings since 1949, and the American Research Bureau (ARB), later called Arbitron. After 1964 radio was measured only in local markets. At that point, radio was in 94 percent of American homes, sets were in use about 15 hours a week—down sharply from pretelevision days—and home receivers were giving way to portable and automobile sets, which were hard to measure. The radio pattern of listening remained the reverse of television—steady, except for a peak in the early morning, a brief spurt during afternoon drive time, especially in large cities, and a drop during television prime time.

The ratings themselves were in and out of trouble (see 8.84). Rumors of fraud and overdependence on ratings led to investigations in 1960–1961 by Congress, which commissioned an intensive investigation of ratings methods and statistics. The resulting report noted several important shortcomings in ratings sampling and survey techniques, statistical standards, and use. In 1963–1964, the House Commerce Committee held hearings on ratings, which included a ten-day grilling of top A. C. Nielsen personnel and uncovered shortcuts and skimping in research techniques that could cause significant differences in the results. Other firms also were examined, including a small company that faked much of its data in the back room, but the importance and problems of Nielsen took up much of the long hearings. From this investigation and its aftermath came several organizations intended to clean up the ratings and their image. The Broadcast Ratings Council combined representatives of networks, broadcasting organizations, and advertisers to oversee ratings operations, making sure—for the benefit of advertisers as well as public relations—that gathering and reporting methods for ratings were accurate

and met acceptable standards. The Committee on Nationwide Television Audience Measurements (CONTAM) was created by and for the networks to conduct a series of studies to find more valid and reliable ways of deriving program ratings. In the 1970s, both organizations became more and more involved with generating positive publicity and information on the ratings system on which networks, advertisers, and stations mutually survive. Statisticians agree that ratings firms now use generally sound methods, although the publicity they engender in station and network promotion efforts might be questioned, and some advertisers and ad agencies place far more reliance upon them than is warranted.

Just as the Lazarsfeld studies in the 1940s described the peak period of radio listening and Bogart's 1956 volume showed the rise of television, two books after 1960 demonstrated television's increasing hold on the American public. The first was Gary Steiner's *The People Look at Television* (1963), based on a 1960 nationwide survey (with a substudy of New York viewers) underwritten by CBS. It showed that television generally had replaced other means of socialization, and that its popularity and use were high in nearly all sectors of the population except for those of high education and income. Interestingly, although viewers nearly always claimed to want more cultural or educational programming when asked about program balance, they usually would pick more entertainment content when given a choice of material. Reactions to overall programming and advertising were highly positive; television was the one nonessential item in the typical home that was regarded as nearly essential.

A decade later this study was repeated, again with support from CBS, in Robert Bower's *Television and the Public*

(1973). This update essentially supported the earlier findings, although the public's fascination with television had worn off—it no longer was a constant topic of conversation and viewers were more critical of it. Television's impact as a news source was greater than in 1960, and parental concern and control over children's viewing were stronger than a decade earlier. Here the specific market surveyed was Minneapolis–St. Paul, and again viewers spoke of desiring more educational and cultural programming, while generally ignoring that choice when it was available. Researchers suggested that in both surveys viewers may have considered cultural programming a “proper response,” regardless of their viewing preferences.

Issued about every two years, starting just after the quiz show scandals, were the “Roper studies” sponsored by the Television Information Office, an arm of the NAB, on what the public thought of television vis-à-vis other media. Early editions drew newspaper criticism for using a method whereby multiple responses showed television as far and away the most believed and most used news medium. Some of the questions used in these studies dated back to Lazarsfeld's work in the early 1940s, providing a longitudinal look at public reaction to broadcasting.

9•72 *Television and Children:
Phases Two and Three*

The Kefauver investigation into television and juvenile delinquency in the mid-1950s (see 8.73) led to an even more intensive investigation in the early 1960s. The new probe came about because people were increasingly concerned over violence in the streets, juvenile delinquency, and the possibility that this behavior was related to violence in television programs.

Some senators and staff members felt that broadcast self-regulation was not reducing violence on the air; others were well aware of the publicity value of hearings on this subject. In addition, some new research had suggested a direct cause-and-effect relationship between media violence and violent activities by viewers. In June 1961, Senator Thomas Dodd (D-Connecticut) opened what became nearly three years of intermittent hearings. In addition, the results of three committee staff monitoring reports of television content in 1954, 1961, and 1964 showed incidents of violence—a very difficult concept to define validly—on television to be increasing, especially at hours when children might be watching.

This second phase of concern over children and television ended late in 1964 with the publication of the hearings and a mimeographed interim report of what had been learned. That the final report never appeared and the interim report had limited distribution spoiled the potential effect of the hearings. The subcommittee suggested greater prime-time network efforts in programming for children, revision of the FCC station application form to clarify the minimal public service and children's program requirements, addition of sanctions to give teeth to the NAB code, a mechanism for the public to voice its opinions of television, and the need for further research. The implied threat was congressional action if the industry did not police itself as it had promised in 1954.

These issues simmered until 1968. That year, in response to the assassinations of Senator Robert Kennedy and the Reverend Martin Luther King, Jr., President Lyndon Johnson created a Commission on the Causes and Effects of Violence with Milton Eisenhower as chairman. The commission's report contained a chapter on media violence and, more importantly, a lengthy staff report in book form on the

issues and questions of media and violence. Other staff reports, accusing broadcasters of failing to clean up violence on the tube, led to Senate action some months later. Senator John Pastore (D-Rhode Island), powerful chairman of the Communications Subcommittee of the Senate Commerce Committee, wrote to the Surgeon General in March 1969 requesting creation of a research panel to evaluate the research literature and conduct original studies on the relation between television and violent behavior. Within six weeks, a research program had been created and funded with \$1.5 million from existing budgets—something of a record for this sort of government action.

Unfortunately, both politics and industry pressure worked against constructive results. The 12 researchers appointed to the panel included five from the networks, three from the academic research community, and "the naive four" with no background in the subject. Having been given a *de facto* veto power, the networks blackballed several well-known television-violence researchers as being no longer impartial since their opinions were well known—and allegedly antinetwork. The 12-member committee let contracts for 23 laboratory and field studies by a wide variety of researchers, as well as some literature review and synthesis. The results were in by late 1971, and the report of the committee, issued in January 1972, appeared to have been written quickly and under pressure. Its inconclusive conclusion was that television violence can affect some of the viewers some of the time. This was not a new notion. Some of the studies themselves, however, published in full shortly after the report, pointed far more strongly to the conclusion that television violence does indeed help stimulate violent actions by some viewers, in both short and long run. Controversy boiled in the

Television Violence: The Surgeon General's Committee Reports (January 1972) / The following conclusions of the best-funded research program into the effects of television are a good example of the imprecision of much social science research. Newspaper accounts of the cautious qualifications contained in the committee reports naturally varied widely.

. . . 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 indication of a causal relationship, but a good deal of research remains to be done before one can have confidence in these conclusions.

The field studies, correlating different behavior among adolescents, and the laboratory studies of the responses by younger children to violent films converge also on a number of further points.

First, there is evidence that any sequence by which viewing television violence causes aggressive behavior is most likely applicable only to some children who are predisposed in that direction. . . .

Second, there are suggestions in both sets of studies that the way children respond to violent film material is affected by the context in which it is presented. Such elements as parental explanations, the favorable or unfavorable outcome of the violence, and whether it is seen as fantasy or reality may make a difference. Generalizations about all violent content are likely to be misleading.

Thus, the two sets of findings converge in three respects: a preliminary and tentative indication of a causal relation between viewing violence on television and aggressive behavior; an indication that any such causal relation operates only on some children (who are predisposed to be aggressive); and an indication that it operates only in some environmental contexts. Such tentative and limited conclusions are not very satisfying. They represent substantially more knowledge than we had two years ago, but they leave many questions unanswered.

Source: The Surgeon General's Scientific Advisory Committee on Television and Social Behavior, *Television and Growing Up: The Impact of Televised Violence*. (Washington: Government Printing Office, 1972), pages 17-19.

trade and public press, and in hearings held by Pastore to sort out what the research expenditure and effort really meant. There was criticism of the networks' role in the formation of the panel and writing of the report. Broadcasters hailed the report as clearing them of a never-admitted responsibility for causing violence. Critics said, "Ignore the report and look at the studies." Academicians worked over the data and strove to improve the methodologies as well.

And there it probably would have died, like the earlier studies, except for one key difference. The 1970s was a period of citizen action groups (see 9.85), and one of the most vocal was Action for Children's Television. ACT had been formed by a group of Boston area mothers concerned about violence on the air and excessive commercialism aimed at children, both on Saturday mornings and in other hours when children were likely to be viewing. ACT and other groups helped arouse public opinion to the extent that the industry and the commission, particularly after Richard Wiley became chairman in 1974, finally took action. The networks agreed to the suggestion from CBS president Arthur Taylor that, starting in fall 1975, prime-time network programming, except for news, before 9:00 P.M. (Eastern and Pacific time) would be for "family viewing" with limits on the depiction of violence. In addition, after 1972 violent cartoons substantially were removed from children's morning and weekend programming (see 9.85). Critics agreed that the amount of violence was diminishing in the 1970s, but the disagreement over the definition of violence was illustrated in disputes over the findings by George Gerbner of the University of Pennsylvania, who regularly issued new editions of an "index" (later dubbed a "profile") that reported the incidence of violence on all

network television programming. ACT, Pastore, and many researchers, critics, and other politicians kept this matter in the public eye—now that the incidence of real-life violence (coverage of the Vietnam War) no longer occupied as much of the evening news before "family viewing."

9•8 Regulatory Confusion

The regulatory scene became much more complicated in the 1960s and early 1970s for several reasons. First, conflicting views arose because there were more participants involved: new broadcasting stations, new groups familiar with and involved in the regulatory process, and new media—cable systems and potential operators of pay-TV and cable systems. Second, events had forced participants to look at problems in new ways. Earlier they had discussed the Fairness Doctrine, cable and broadcast television relationships, and ownership and control, but now these issues became much more salient and controversial and often intractable. Third, the proliferation of stations and services, such as FM and public television, together with pressures from such closely related media as audio and video recordings, produced greater competition within the industry.

9•81 *Changing Cast of Regulators*

On the regulatory scene, older groups changed and newer ones arrived. The FCC was shaken up to an extent not seen since the days of James Lawrence Fly in the 1940s. In 1961, after the conflict of interest scandals involving Commissioners Doerfer and Richard Mack, President Kennedy appointed thirty-four-year-old Newton Minow to the FCC chairmanship. Minow early served notice of his displeas-

sure with much of what was broadcast when he spoke before the NAB of television as a “vast wasteland” (see this chapter’s opening quotations) requiring more high quality television programming. The phrase caught on with the public. While the industry fretted over the newly critical FCC, Minow helped provide a Kennedy “New Frontier” activism to commission decisions. However, he was hamstrung by more conservative holdover appointees and, soon frustrated, he returned to private law practice in 1963. Minow was replaced by an even younger activist chairman, E. William Henry, until 1966. After Henry’s departure, veteran Commissioner Rosel Hyde became chairman but could not readily control Commissioner Nicholas Johnson’s highly public consumer activism (see below). President Nixon named conservative GOP leader Dean Burch as chairman in 1969. Serving until 1973, when he joined the White House staff, Burch was considered one of the FCC’s better administrators, with the commission arriving at decisions in several controversial areas (particularly CATV) just before his departure. He also kept the FCC’s factions communicating. Burch and Johnson both left in 1973, and General Counsel Richard Wiley was elevated to commissioner and in 1974 to the chairmanship. Wiley proved to be an even better administrator than Burch, establishing an atmosphere of hard work and more timely decision-making. When Wiley left the FCC for private law practice in October 1977—some months after his term normally would have ended because of Carter Administration delays in replacing him—he left a high standard for his successor, former congressional aide Charles Ferris, to meet.

During much of the 1960s, the team of Kenneth Cox and Nicholas Johnson issued reports and dissents attacking broadcasting organizations and practices, per-

suaded the commission to hold a couple of well-publicized citizens’ gripe sessions outside of Washington, and supported greater citizen action to upgrade public service broadcast programming. Their approaches were different; Cox was generally low key, but the youthful Johnson quickly took his campaign to the public. He built a constituency with books like *How to Talk Back to Your Television Set* (1970), many articles and speeches, and detailed dissenting opinions to FCC decisions. He sometimes shot from the hip, but he awakened public interest and concern and made people feel that they had a voice on the commission. At the opposite end of the political spectrum was Commissioner Lee Loevinger, one of the brightest men ever to serve on the FCC, a strong conservative whose well-honed legal mind generally matched the liberalism of Cox and the more radical opinions of Johnson. Both Johnson and Loevinger had been appointed to the FCC because they had ruffled too many feathers on earlier government jobs: Loevinger as head of the antitrust division of the Justice Department and Johnson as head of the Maritime Commission. President Nixon soothed the broadcasting industry with his appointment of commercial broadcasters Robert Wells and James Quello but aroused the ire of consumer and minority groups. Yet Nixon also appointed the first black on the FCC, Benjamin Hooks. Hooks started quietly but by 1974 was making stronger statements on the place of minorities in broadcasting—and probably stepping on toes by insisting on enforcement of equal employment opportunity rules, even for PTV stations. Nixon also named the second woman to serve on the FCC, Charlotte Reid, who was much less important to the commission’s deliberations than the first (see 7.42 and 9.825). For much of the period, the commission was ideologically divided.

By the late 1960s the FCC, designed in 1934, was beginning to suffer from overload, but in the 1970s it was nearly swamped. Controlling interstate telephone and telegraph as well as broadcasting, it spent an increasing amount of time on complicated safety and special service rules, communication satellite policy, cable television, and processing paperwork for more than 9,000 broadcast and millions of other stations. It had to act on everything: from the millions of letters insisting that a petition to require fairness on religious-body-owned stations was a "petition against God"—an attempt to remove all religion from the air, to the occasional complaint about obscene programming, particularly on educational stations—the Pacifica Foundation's WBAI, the University of Pennsylvania's WXPN—since few commercial broadcasters would risk their licenses. As new technology and innovations made long-range policy questions more insistent, the FCC had even less time than in the 1930s to consider them.

Two kinds of studies had been undertaken to examine the FCC's policies and efficiency, particularly in the decision-making process. First were those concerned with organization—one conducted for the 1949 Hoover Commission on executive branch organization, one prepared under Judge Landis's direction for President Kennedy, and one prepared under Roy Ash's direction for President Nixon. Second were those concerned with telecommunication policy—the President's Communications Policy Board established by President Truman, and the President's Task Force on Communications Policy, which reported to President Johnson at the very end of his term.

In response to some of these analyses and the shortcomings of the FCC in the late 1960s, and in order to accumulate more immediate power, President Nixon

proposed to Congress early in 1970 that the Office of Telecommunications Management, a staff agency primarily concerned with government agency spectrum use and assignment, be converted to an Office of Telecommunications Policy (OTP). It would have a broader purview, including supervision of the more than 50-year-old Interdepartmental Radio Advisory Committee, and would be located within the Executive Office of the President to show its power to speak for the executive. The plan was activated in April, and Rand Corporation researcher Clay T. Whitehead was named to head the OTP. It quickly became clear that, while OTP would provide needed long-range policy planning and research, using facilities of the Office of Telecommunications in the Department of Commerce, its function was more actually political than technical.

OTP's first major coup was engineering a compromise between NAB and NCTA in fall 1971 that led to the 1972 FCC cable rules (see 9.83). Soon it was involved in five-year license terms for broadcasters, a major broadcaster goal for most of this period; VHF channel drop-ins in large markets ostensibly to broaden competition; limiting program reruns, brought about by administration concern for unemployment in the West Coast entertainment production unions; financing for public broadcasting; and limiting the Fairness Doctrine. After the demise of the Nixon administration in 1974, OTP almost dropped from sight and Whitehead resigned. Although it was kept alive by members of Congress who realized the potential value of long-range policy and research, after 1973 OTP had little of the strength of its earlier years, when the FCC, broadcasters, and many citizens had become increasingly concerned about White House encroachment onto commission regulatory territory. Under the Carter

Administration, the OTP was eliminated, with most functions going to the Department of Commerce. A new Undersecretary of Commerce for Communications and Information—former FCC General Counsel and Aspen Institute consultant Henry Geller—was appointed to head these activities.

A third participant in the regulatory arena, in addition to the FCC and OTP, was the U.S. Court of Appeals for the District of Columbia, which the 1934 Communications Act had designated to hear all appeals from FCC decisions. Until the 1960s it usually had backed up FCC decisions on appeal, seldom taking it to task unless procedures had been badly mismanaged, and many broadcasters looked on it as the enforcement arm of the commission. Changing membership on that court, which has nine members—three of whom normally sit on a given case—and changing public pressures, however, changed the court's view of the FCC and the industry. This new view was brought home with a vengeance in March 1966 when a three-judge panel overturned an FCC decision which had refused to let a citizen's group stand as a participant in a license-renewal case. The Office of Communications of the United Church of Christ, headed by Edwin Parker, had sought to speak for the 45 percent black population of Jackson, Mississippi, for the purpose of denying license renewal to WLBT. The panel of judges, in what became a landmark case, held that the public was entitled to participate in such proceedings. Hitherto, such matters had been between broadcasters and the FCC, claiming to act on behalf of the public, and sometimes other broadcasters with an economic interest. Over the next several years, by granting other citizen groups the right to be heard before the FCC, the court expanded public access to the decision-mak-

ing process. In 1969, the court went further in the same case, ordering the FCC to lift WLBT's license and assign it to an interim operation—a *very* rare action—until a new "permanent" licensee could be selected. The decision spoke of the FCC's "curious neutrality in favor of an existing licensee." By 1970 some industry observers were referring to this increasingly independent and anti-FCC court as "broadcasting's preemptive court." Public interest groups rapidly understood that, if the FCC denied them standing or access, they could often obtain it on appeal. The preemptive role of the court seemed to expand into the mid-1970s.

Major concern for long-range broadcast policy in Congress switched from the Senate side (where longtime Communications Subcommittee head John Pastore retired late in 1976) to the House Communications Subcommittee under Torbert Macdonald (D-Massachusetts) and then Lionel Van Deerlin (D-California). With a professional and knowledgeable staff, the subcommittee held a series of hearings into many aspects of communications, expressed concern about the limited role of cable versus broadcasting, and looked into the varied interrelationships of point-to-point communications and the broadcast-cable media. Late in 1976, Van Deerlin announced the subcommittee's most extensive project yet, aimed at a complete review and possible rewrite of the 1934 act.

9•82 *Fairness on the Air*

The FCC's Fairness Doctrine (see 7.84) caused growing controversy during the 1960s and 1970s. Politics, cigarette advertising, the Vietnam War, and other matters were reflected in the growing body

Rise of the Fairness Doctrine

January 16, 1941 Radio can serve as an instrument of democracy only when devoted to the communication information and the exchange of ideas fairly and objectively presented. A truly free radio cannot be used to advocate the causes of the licensee. It cannot be used to support the candidacies of his friends. It cannot be devoted to the support of principles he happens to regard most favorably. In brief, the broadcaster cannot be an advocate.

FCC, "Mayflower Decision," 8 FCC 333.

June 1, 1949 To recapitulate, the Commission believes that under the American system of broadcasting the individual licensees of radio stations have the responsibility for determining the specific program material to be broadcast over their stations. This choice, however, must be exercised in a manner consistent with the basic policy of the Congress that radio be maintained as a medium of free speech for the general public as a whole rather than as an outlet for the purely personal or private interests of the licensee. This requires that licensees devote a reasonable percentage of their broadcasting time to the discussion of public issues of interest in the community served by their stations and that such programs be designed so that the public has a reasonable opportunity to hear different opposing positions on the public issues of interest and importance in the community. The particular format best suited for the presentation of such programs in a manner consistent with

the public interest must be determined by the licensee in the light of the facts of each individual station. Such presentation may include the identified expression of the licensee's personal viewpoint as part of the more general presentation of views or comments on the various issues, but the opportunity of licensees to present such views as they may have on matters of controversy may not be utilized to achieve a partisan or one-sided presentation of issues. Licensee editorialization is but one aspect of freedom of expression by means of radio. Only insofar as it is exercised in conformity with the paramount right of the public to hear a reasonably balanced presentation of all responsible viewpoints on particular issues can such editorialization be considered to be consistent with the licensee's duty to operate in the public interest. For the licensee is a trustee impressed with the duty of preserving for the public generally radio as a medium of free expression and fair presentation.

FCC, "In the Matter of Editorializing by Broadcast Licensees," 13 FCC 1246, paragraph 21.

September 14, 1959 Nothing in the foregoing sentence [a modification of the "equal opportunities" for political candidates clause in Section 315 of the Communications Act of 1934] shall be construed as relieving broadcasters, in connection with the presentation of newscasts, news interviews, news documentaries and on-the-spot coverage of news events from the obligation imposed upon them under

this Act to operate in the public interest and to afford reasonable opportunity for the discussion of conflicting views on issues of public importance.

Public Law 86-274, 86th Congress (amending the 1934 Communications Act).

June 9, 1969 It is the right of the viewers and listeners, not the right of the broadcasters, which is paramount . . . It is the purpose of the First Amendment to preserve an uninhibited marketplace of ideas in which truth will ultimately prevail, rather than to countenance monopolization of that market, whether it be by the Government itself or a private licensee . . . It is the right of the public to receive suitable access to social, political, esthetic, moral, and other ideas and experiences which is crucial here. . . .

In view of the 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 [Public Attack Rules] and ruling [Fairness Doctrine] at issue here are both authorized by statute and constitutional.

Supreme Court decision in *Red Lion Broadcasting Co. v. FCC*, 395 U.S. 367.

May 29, 1973 If broadcasters were required to provide time, free when necessary, for the discussion of the various shades of opinion on the issue . . . the affluent could still determine in large part the issues to be

discussed. Thus . . . a right of access . . . would have little meaning to those who could not afford to purchase time in the first instance.

If the Fairness Doctrine were applied to editorial advertising, there is also the substantial danger that the effective operation of that doctrine would be jeopardized. To minimize financial hardship and to comply fully with its public responsibilities a broadcaster might well be forced to make regular programming time available to those holding a view different from that expressed in an editorial advertisement. . . . The result would be a further erosion of the journalistic discretion of broadcasters in the coverage of public issues, and a transfer of control over the treatment of public issues from the licensees who are accountable for broadcast performance to private individuals who are not. The public interest would no longer be "paramount" but rather subordinate to private whim. . . . The congressional objective of balanced coverage of public issues would be seriously threatened.

Supreme Court decision in *Columbia Broadcasting System, Inc. v. Democratic National Committee*, 412 U.S. 94.

June 25, 1974 The clear implication has been that any such a compulsion to publish that which "'reason' tells them should not be published" is unconstitutional. A responsible press is an undoubtedly desirable goal, but press responsibility is not mandated by the Constitution and like many other virtues it cannot be legislated.

Supreme Court decision in *Miami Herald Publishing Co. v. Tornillo*, 418 U.S. 241.

of case law. Congress had perhaps inadvertently provided a statutory base for the Fairness Doctrine in 1959, when it amended Section 315 (the political “equal opportunity” section of the Communications Act) to note that nothing in the revised section would exempt broadcasters from their responsibility “. . . to afford reasonable opportunity for the discussion of conflicting views on issues of public importance.” The Supreme Court’s *Red Lion* decision in 1969 (see box on page 427) firmly supported the idea that the concept of fairness, which was intended to benefit the average citizen and viewer and which previously had been included under the “public interest” standard, now had its own statutory authority. The FCC published specific regulations on the “personal attack” aspects of fairness in 1967 and 1968, and public notices which codified the case law and defined proper and improper adherence to the “controversial issues” aspects of the Fairness Doctrine. Many broadcasters, and others who opposed FCC intervention in programming because of the First Amendment, were unhappy about these steps.

The 1964 notice included rigid rules for broadcasting editorials—the station would have to seek out opposing views—and even more rigid rules for informing, providing texts, and providing rebuttal opportunities for persons attacked.

A landmark case began with a 15-minute recorded program in which right-wing preacher Billy James Hargis attacked Fred Cook, author of a book critical of Senator Barry Goldwater, the Arizona conservative Republican candidate for President in 1964. Around two hundred stations carried the program, and Cook, apparently with some support from the Democratic Party, claimed time to reply from all of them. Most offered him the free time required under FCC fairness rules. But WGCB—in the small town of Red Lion,

Pennsylvania, 75 miles west of Philadelphia, which had broadcast the program in November 1964—sent him a rate card offering to *sell* reply time. Cook appealed to the FCC, which ordered the station to give the time. On WGCB’s refusal, the issue entered the courts, with the station losing at all levels, and eventually reached the Supreme Court of the United States. There, it was combined with another case, in which the Circuit Court of Appeals in Chicago had upheld the attempt of the Radio Television News Directors Association to modify or loosen the editorializing and personal attack rules which they thought had restricted broadcast journalism. The two opposing decisions helped make these cases a fit subject for Supreme Court adjudication. The *Red Lion Broadcasting Co. v. FCC* decision in June 1969 was the most important broadcast-related court decision since the 1943 network case (see 5.83). The court upheld the FCC’s editorializing and personal attack rules and its right to enact a Fairness Doctrine, reaffirming the paramount importance of the listener or viewer under the 1934 Communications Act. In the early 1970s, two cases showed some limits to the Fairness Doctrine. The Business Executives Move for Peace in Vietnam (BEM) and the Democratic National Committee (DNC) tried separately to get broadcasters to sell them advertising time to comment on current issues of public importance. The broadcasters turned them down. In a 1973 decision, the Supreme Court upheld the commission’s refusal to overturn broadcasters’ judgment, suggesting that to allow such sales might undermine the licensees’ journalistic decision making and responsibility for content aired over their stations.

The purpose of the Fairness Doctrine is simple, although specific applications have become incredibly involved. The doctrine is intended to encourage expres-

sion of varied points of view on controversial issues, including the views of the station licensee. While some overall guidelines exist, and the “personal attack” part of the Fairness Doctrine is in the FCC Rules, the commission generally has decided each “controversial issues” case on its merits in accord with the principle that the public deserves to receive opposing views on controversial matters of public importance. To guide licensees, the FCC issued a primer in 1964, conducted a dialogue from 1971 through 1974 on all aspects of the doctrine, and issued a long public notice in 1974. Some critics complain that the doctrine is too vague and that it involves governmental meddling in key areas of programming. They suggest that its requirements often keep broadcasters from doing any discussion of controversial issues for fear of having to defend themselves before the FCC. Communications attorney Jerome Barron, among others, believes that the public interest would be served better by unlimited *access* to the airwaves by all who want it than by *fairness* left in the hands of the broadcaster. Senator William Proxmire has introduced bills to abolish the Fairness Doctrine, reverting to an absolute view of the First Amendment stricture that “Congress shall pass no law” in this area. Yet many others, notably members of minority groups, rely on the doctrine for the opportunity to air their views on controversial issues of public importance.

Although not part of the Fairness Doctrine as such, during the early and mid-1970s the FCC became active in supporting equal employment opportunity in the broadcasting industry, by requiring stations regularly to submit data on minority and female employment, and by considering such matters in comparative and license renewal hearings. The WLBT case (see 9.81), in fact, involved claims of

discrimination against blacks, both in employment and in program content, as did the FCC’s 1975 action refusing to renew the licenses of eight stations of the Alabama educational television network. The latter decision marked the first time a public television license had been lifted—though the case is still in litigation.

9•83 *The Cable Conundrum*

Although cable systems had provided limited television service—from one to three channels—to small communities since 1949 (see 8.24), their competition with television stations was not immediately apparent. Around 1959 broadcasters began to object seriously to cable picking broadcast programs off the air free and selling them to subscribers, with broadcast stations and program originators getting nothing for the use of their product. But there was little local or state regulation of cable until the early 1960s, and the FCC was contending that it could not federally regulate cable under the 1934 act because it was not a broadcasting service and was intrastate in nature.

In 1959, the FCC issued its first analysis of the relationship between CATV and broadcasting, focusing on three former UHF stations that claimed cable had helped force them off the air by not carrying their signals. Some leading cable operators pushed for federal regulation so as to avoid a confusion of local and state rules, while others wished to maintain the local orientation of their industry. In a 1962 case, the commission decided to take limited regulatory control over systems that used microwave relay to bring in distant signals (beyond off-air pickup range) to the *head end*, and imposed carriage and nonduplication rules to protect broadcast licensees from economically damaging conditions.

In 1965 the FCC expanded its microwave rules to cover both intra- and inter-state systems, and required that they carry any television station within 60 miles when requested to, and that they refrain from showing the same shows from a distant station for 15 days before or after the local television station airing. Less than a year later, another order limited CATV growth in the country's top 100 markets by requiring such systems to get specific approval for carrying distant signals. This was based on the belief that both cable and UHF would grow best in urban areas, because of the density of the population and lower costs of reaching that audience, and that, if cable were unrestricted, finan-

cially weak local UHF stations might be forced off the air. The likelihood that cable would serve only *parts* of a given urban area, certainly not for as many miles radius as a station, made it less in the public interest.

The Supreme Court upheld the FCC's authority to regulate cable if that authority was related in some way to the commission's statutory regulatory power over broadcasting in *Southwestern Cable Co. v. United States* (1968). The next year, the FCC proposed that cable systems with more than 3,500 subscribers be required to originate some programming over one of the six to eight channels they carried. Court challenges delayed the effective imple-

The FCC Moves (Slowly) on Cable Television / These excerpts from FCC *Annual Reports* (unless otherwise noted) show the slowly increasing FCC concern about and control of cable television—roughly matching the industry's expansion (see Appendix C, table 10).

The Commission is considering a petition which requests that the status of community antenna systems under the Communications Act be clarified. The question whether such services constitute common carrier or some other operation which comes within the Commission's jurisdiction is under study.

1955 (21st Report), page 99.

... CATV systems should be required to obtain consent of the stations whose signals they transmit and ... they should be required to carry the signal of the local station (without degrading it) if the local station so requests. Since both of these steps require changes in the Communications Act, we will shortly recommend to Congress appropriate legislation ...

1959, Report on Docket 12443, paragraph 99.

In April 1965, the Commission adopted its First Report and Order ... imposing certain carriage and nonduplication conditions for microwave-served CATV systems. ... The order prohibited duplication

of the programs of local and nearby TV stations for a period of 15 days before and 15 days after broadcast and required carriage by the CATV system of the programs of the local TV stations without material degradation of its signals. At the same time, the Commission instituted an inquiry and proposed rulemaking ... tentatively concluding that it has jurisdiction over all CATV systems, whether or not microwave-served.

On February 15, 1966, the Commission announced a broad plan for regulating all CATV systems over which it asserted jurisdiction, whether or not microwave-fed. On March 4, 1966, the Commission adopted a covering ... Second Report and Order ...

In August 1966, the Commission created a special Task Force on CATV to advise it in CATV matters, implement covering rules and other requirements, and to expedite the processing of applications and pleadings.

1966 (32nd Report), pages 86–88.

No CATV system operating within the predicted Grade A contour of any TV broad-

mentation of this order, and it was eventually dropped.

The definitive FCC rules on cable appeared in 1972. Cable systems were freed to expand in the top 100 markets, although with restrictions on the number and kind of signals they could carry. They had to offer channels to municipal governments and educational institutions and provide access for members of the public with something to say. New systems had to have at least 20 channels and existing ones had to have them by 1977—although these requirements were later postponed. Systems in smaller markets could import fewer signals, as the population was smaller and the harm to over-the-air local television

stations might be greater. Older systems could continue to operate under the original, simpler regulations, but newer systems had to follow a maze of carriage and protection rules. Pay-TV over cable, which by the late 1960s appeared more likely than pay-TV over the air, was officially permitted in the late 1960s and specific rules on content, to prevent loss to over-the-air television of series programs and sporting events like the World Series, were included in the 1972 rules. Most of the restrictions were challenged, and the courts and the commission had dropped or modified many of them by 1977.

Yet, by 1977, the predicted cable revolution or “wired nation” was not hap-

cast station in the top-100 television markets may bring in the signal of a distant station until the Commission determines that the service would be in the public interest. The Rules call for an evidentiary hearing in major market cases.

1968 (34th Report), page 46.

By January 1970, the rapid growth of the CATV industry necessitated creation of the Cable Television Bureau, charged with administering and enforcing the CATV rules, gathering information about the CATV industry and advising the Commission on CATV matters generally.

In the . . . Order . . . adopted October 4, 1969, the Commission required CATV systems with 3,500 or more subscribers to have available facilities for the local production and presentation of programs.

Although no specific rules have yet been adopted, the Commission has sought to encourage CATV systems to make CATV channels available for public use, either free of charge or on a common carrier or contract basis. The interconnection of CATV

systems for purposes of distributing non-broadcast programming has also been encouraged. The Commission's CATV origination rules were expressly intended to pre-empt and supersede all inconsistent State and local restrictions on CATV program origination. States and localities, however, remain free to impose additional affirmative obligations not inconsistent with Federal regulatory policies.

In separate proceedings concluded in . . . 1970, the Commission prohibited CATV system ownership by telephone companies within their local exchange areas; by television stations within the same market; by national television networks anywhere in the country . . .

1970 (36th Report), pages 66–67.

New rules for cable TV, representing the most comprehensive compilation of regulations since the first general rules were issued in March 1966, were adopted February 2, 1972, and became effective March 31, 1972 . . .

1972 (38th Report), page 78.

pening. The downturn in the economy after the Vietnam War caused older systems to have increasing economic difficulties and discouraged expansion and construction of new systems. The largest cable MSO (multiple system operator), Tele-Prompter, had serious reverses, and its president went to jail for bribing city officials to obtain a franchise. Expectations of the big cities becoming fertile markets for CATV were not borne out, and the "public access" channel did not take hold in New York, where it first was tried. Only a few "video freaks" and persons who wanted to see how far they could go with pornographic programming made full use of the channel, and the audience was tiny. Although the cable industry gained friends by offering free service to 1974 political candidates, the operators claimed that the three-level regulatory situation—federal, state, and city or other local franchising authority—in some states was stifling development and asked that legislatures "shed a tier" of regulation. The 1972 requirements for 20-channel capacity and originating various services made starting and operating a cable system so expensive that a fair return seemed doubtful, particularly since many of the best potential markets, underserved by broadcast television, had already been wired. Cable adherents claimed that the FCC was restricting cable to protect broadcasting, while broadcasters objected to the lack of reimbursement from CATV's "unfair" use of their programs. In 1976, the FCC decided to postpone implementation of many 1972 rules, including rebuilding.

Congress had been holding hearings on revisions of the 1909 Copyright Law for years, with little result, and a firm decision on cable's copyright liability had to wait until the law was changed, which it was late in 1976, to take effect a year later. Since, under FCC rules from the late 1960s, television broadcasters could not

own cable systems within their primary coverage area, the battle lines were drawn, and the NCTA and NAB could find little to agree upon—even when forced to "agree" on copyright liability and licensing under pressure from the FCC and the OTP. In the meantime, as seen in Appendix C, table 10, cable continued to expand slowly, but the wired city or nation was a long way away.

9•84 *Who Shall Own the Stations?*

Monopoly control of broadcasting became an important issue again in the 1960s. The major concern was over the control of television stations, because they attracted by far the largest audience and showed up consistently as the major source of news. The slowly increasing power of group owners—firms, not networks, owning stations in several different markets—became apparent to Congress and the FCC by the early 1960s. Revived fears of newspaper dominance of broadcasting led to denial of one license renewal and new rules to keep television networks from controlling any CATV systems or local stations from controlling cable systems in the station's coverage area. The Justice Department intervened in several "concentration of control" cases. Whether or not a changing cast of commissioners was willing to go so far is uncertain, but the trend was toward "one station to a customer." Complicating these issues after 1970, members of minority groups became increasingly vocal about their lack of media ownership.

The commission's first major move, in 1965, was to propose that ownership of television stations in the top 50 markets be limited to three, only two of which could be VHF. Rather than promulgate such a rule, the FCC proceeded case

by case, but it waived the proposed rule in every case and finally killed the idea early in 1968. That year (1965), however, the FCC implemented a new comparative license procedure for use when two or more applicants desired the same broadcast channel. Key criteria were the applicant's capacity to attune to local concerns, to favor local control rather than group ownership, to avoid connections with local newspapers or other broadcast stations. Unlike the 50-market ruling, this procedure has been upheld on court review as has the requirement that licensees survey the public and community leaders in order to ascertain the community's needs.

A cold wind blew on broadcasters in 1969 when the FCC voted not to allow the *Herald Traveler* newspaper to retain the license for WHDH, channel 5 in Boston, apparently on grounds of cross-media ownership. Although technically the action stemmed back to the original 1957 grant for the station, which had been challenged because of *ex parte* contacts (the "\$100,000,000 lunch") and remanded by a court to the FCC for reconsideration, most broadcasters felt that their own licenses now were insecure, no matter how well the station had been programmed or for how long. In 1972, after appeals failed, the *Herald Traveler* gave up channel 5 to an independent, locally owned consortium and promptly went out of the newspaper business, keeping only a radio station. It was a convincing demonstration of the importance of television to the financial well-being of a newspaper-station combination. The new licensee of channel 5, operating as WCVB, has demonstrated something else: programming many hours of locally produced programs a day can be profitable.

The unique WHDH decision not only shocked the industry, it also increased the number of petitions to deny renewal and caused many licensees to fear renewal time—once a simple formality.

Their reaction led to FCC concern, triggered by congressional pressure, about the economic and psychological stability of the industry. As a result, it ill-advisedly issued a public notice early in 1970 on comparative broadcast proceedings, stating that the incumbent licensee would be relicensed every three years *unless* its programming and public service could be shown to have been less than adequate. Until such showing was made, competing applicants would not be considered. Most of the industry naturally liked this idea, but newly vitalized public interest groups and law firms protested. They claimed that the ruling was against the intent of the 1934 act, since it essentially gave indefinite licenses to incumbents. The Court of Appeals for the District of Columbia overturned the FCC proposal within a year, leaving some confusion, since the commission had repeatedly said that WHDH would *not* be a precedent. Parallel developments helped dispel the confusion to some degree.

In April 1968, the FCC initiated a rule-making docket on ownership during the hearings on which it would consider most of the arguments and controversies. The commission adopted a one-to-a-customer rule in 1970, prohibiting common control of more than a single AM, FM, or television station in the same market. Since many major market operations were based on full or partial AM-FM-TV combinations, existing combinations could be retained until the stations were sold. AM-FM combinations could continue, but radio-television combinations had to be divested when sold. Only in mid-1977, incidentally, was the FCC limit of 21 stations under control of one owner reached, when the FCC approved the sale of an FM station to Park Broadcasting—the first such "maximum owner" with a full complement of seven AM, seven FM, and seven television stations.

In 1970 the commission under-

took a long rule-making procedure concerning newspaper-broadcast station cross-ownership in the same market (see 5.83). Early in 1975, a rule was issued essentially grandfathering the many existing cross-media combinations, but requiring divestiture in several small markets where the only paper and the only broadcast station were under common ownership. The Court of Appeals for the District of Columbia overturned that decision in the spring of 1977, contending that if cross-ownership was "bad," as the court felt the record suggested, then *all* cross-ownerships in the same market should be divested. This case was under consideration by the Supreme Court in late 1977.

9•85 *Self-Regulation and Citizen Action*

The broadcasting industry after 1960 faced the worst heat in its history. While most viewers and listeners were satisfied with their program fare, many public service and special interest groups pressured the broadcasting industry to change its ways in respect to advertising, especially in commercials for children, amount of advertising time, and types of products advertised; program violence; ownership patterns; access for minority views and talent; portrayal of various ethnic and religious groups; and minority and female employment. It was not an easy time to be a defender of broadcasting.

Much of television's public relations effort was shouldered by the Television Information Office (see 8.85), which continually issued reports, analyses, newspaper editorial reprints, slide presentations extolling American television, and its well-known survey series on what the public thought about television and

other media (see 9.71). TIO's parent, the National Association of Broadcasters, was affected by internal dissension caused by the wide range of broadcasting services, viewpoints, and goals. After the death of a broadcaster-president, the NAB tried to achieve political visibility by replacing him in 1961 with former Florida governor LeRoy Collins. Collins was a man of convictions, and his sympathetic view of those who would limit cigarette advertising and other issues brought him powerful enemies within NAB, and a relatively short tenure as president. He was succeeded by NAB staff member Vincent Wasilewski, whom the membership liked more, although while he was in office NAB lost many campaigns before the public and Congress. It fought hard against the ban on cigarette advertising and lost heavily, since even the tobacco companies knew it was time to quit and had retired gracefully—and profitably, since advertising costs went down and sales remained steady—leaving broadcasters holding the bag. The association then focused on lengthening the broadcast license period to five years and presuming that a license would be renewed unless there were strong reasons for refusing it. That campaign had not succeeded by mid-1977. The NAB may have raised the First Amendment flag too often—every time somebody suggested the smallest change in American commercial broadcasting. As congressional committees tired of this line, the increasingly vocal minority and public interest groups became more effective.

NAB had to become defensive. The radio and television codes were frequently revised, but the revisions usually weakened them—except in instances where Congress had shown that tightening of standards was politically essential. The most serious problem was that the codes had no teeth. A station that violated their provisions only lost its right to show the

code seal—surely a doubtful deterrent. Such long-banned products as personal hygiene products and hemorrhoid treatments found their way onto the nation's screens and loudspeakers as commercial standards came down in the wake of the cigarette advertising decision and the economic recession of the 1970s. It was not until 1975 that the NAB required its own members to subscribe to the radio or television code—a requirement dropped a year later.

An example of the “Catch 22” problem in self-regulation arose in the 1975–1976 “Family Viewing Time” case. Although accounts differ (and those differences became very important), apparently FCC Chairman Wiley strongly encouraged the networks and the NAB to institute a policy of limiting violence in programs telecast before 9 P.M. (8 P.M. in the Central and Mountain zones). Then-CBS President Arthur Taylor championed this move, and the industry climbed on the bandwagon—except for the West Coast package companies making about 80 percent of all television programs. Led by producer Norman Lear, they claimed that Wiley had violated the First Amendment by advocating such a provision in the NAB code, that the networks had violated the antitrust laws by agreeing to it, and that, even more important to the packagers, it cut into their potential revenues from syndication, as programs deemed violent and played on the networks only after 9 P.M. were similarly limited when played on local stations adhering to the NAB code. The program packagers took the issue to court. Late in 1976, a federal district judge in Los Angeles ruled that the “Family Viewing Time” self-regulatory rules were mainly due to excessive behind-the-scenes pressure from the FCC on the networks and the NAB. The decision, a long and important one, was appealed, but it put the whole self-

regulatory process in doubt when it said that an industry's attempt to self-censor all its members was unfair, regardless of the purpose. Each licensee had to make its own final decisions on programming.

Making NAB's job tremendously harder were the new activist groups concerned with broadcasting. They had gained impetus from FCC Commissioner Nicholas Johnson, who, in his 1966–1973 term, had called for reforms and greater public input into broadcasting decisions. While listening groups had existed since the 1930s, few had made an impact on broadcasters or the general public. One of the most active of the new breed of public interest groups in the 1960s was one of the oldest—the Office of Communications of the United Church of Christ. It was the prime mover in the Jackson, Mississippi (WLBT) case (see 9.81), which helped open the regulatory process to public input. It continued to be active in other license cases, in studying the role of minority hiring in broadcasting, and in putting out useful publications on how to get the public involved in radio and television.

After several years of effective grassroots action, Action for Children's Television (see 9.72) forced NAB code changes on commercialism and violence and an FCC hearing on the topic, and found funding for research studies. In the mid-1970s, ACT began to create local community groups with the same goals. The National Citizen's Committee for Broadcasting (NCCB), originally a public broadcasting support group in New York in the late 1960s, under ex-Commissioner Johnson moved to Washington in 1974, started a bi-weekly magazine (*access*) and began to seek active input into broadcast decision-making by connecting local groups with public service law firms, sources of financial support and necessary information. Other nonbroadcast-oriented national

groups—from the American Medical Association to the Parent-Teacher Association—became interested in, commented upon, and even, in the case of the PTA, threatened a boycott of advertisers' products because of violence on television.

Many smaller groups concentrated on the employment and the portrayal of women in television and radio; ethnic programming—usually working to remove such negative images as *The Untouchables* (Italian-Americans), the television version of *Amos 'n' Andy* (blacks), the "Frito Bandido" commercials (Mexican-Americans); and blacks in broadcast ownership and programming. This last cause was aided in 1972 with the appointment of black Benjamin Hooks to the FCC (see 9.81). Many of these groups were very activist, applying for a license up for renewal or petitioning for its denial in order to get the broadcaster's attention, and then bargaining for whatever the group wanted, such as employment or more programming time. The beleaguered broadcasters thought of this as blackmail, but it was effective—although the FCC warned that the broadcaster could not delegate his authority to decide what should be aired. Broadcasting became a battleground of lobbyists, advocates, and pressure groups—all somewhat encouraged by the courts, a more open FCC, foundation-supported national organizations, and foundations themselves such as Markle and Ford.

Another factor, if only as a yardstick or precept, was the loosely organized groups of listener-supported radio stations—the Pacifica stations in Berkeley, Los Angeles, New York, and Houston; the "KRAB Nebula" stations, and some very independent independents in Seattle, San Jose, San Francisco, Dallas, St. Louis, Yellow Springs, and elsewhere. Several of these were established or otherwise nurtured by Lorenzo Milam, who put a sub-

stantial financial legacy and much time into many of these stations. His philosophy is best expressed in *Sex and Broadcasting*, a handbook on how to start a community radio station that poses seldom asked questions about the purpose of broadcasting.

Of particular interest were the first feeble attempts toward increased professionalism and self-policing by newsmen, both broadcast and print. In the late 1960s spurred by overt antagonism toward the press at the Democratic National Convention in Chicago in 1968 and by the Nixon administration's attacks on the media, several journalism reviews were established. These ranged from the prestigious *Columbia Journalism Review* to infrequently published magazines in a dozen other cities, and provided a much-needed public washing of dirty linen as well as seminars on journalistic ethics. Journalism had no professional organization with the prestige and moral authority to establish and enforce a code of ethics in the way that law and medicine policed their memberships, although the Radio Television News Directors Association and the Society of Professional Journalists/Sigma Delta Chi—tried. Accordingly, attempts were made, with foundation help, to establish a national "press council," the National News Council, to adjudicate claims of unfairness made against broadcasting and the printed press. Some of the complaining groups, such as Accuracy in Media, and individual complainants were vulnerable to charges of bias themselves, but most wanted to improve the social responsibility of the media.

9•9 The Impact of Broadcasting after 1960

Broadcasting, despite its growing diversity in programming, brought the na-

tion together from time to time. Most of these occasions were tragic, such as the assassinations of John F. Kennedy, Martin Luther King, Jr., and Robert F. Kennedy, and the resignation of Richard M. Nixon. But, more positively, in 1969 most of mankind watched Neil Armstrong step onto the moon.

9•91 *Crises for Media Competing with Television*

Television, it must be remembered, had captured the entertainment function of the mass media almost completely by 1960. Motion pictures had felt the pinch in the 1950s and, until the networks began heavy use of feature films in the early 1960s, the film industry was surviving on a few blockbuster films, a few dependable stars, and by making television programs. Most television series were shot on film in Hollywood as well as many of the “made for television” feature films (see 9.63), which were developing in the late 1960s. Although there was a new generation of moviegoers, and films for them, much of Hollywood’s income in the early 1970s came from prime-time network showings of recent movies. Still, unemployment in the creative trade unions in Hollywood was so high that the Nixon administration condemned the increasing use of reruns on television, which limited the need for original program material. In spite of this threat to the networks, Hollywood remained television-dominated, in both ownership and output. The independent producers—often successful directors or stars who could convince the banks that they were a good risk for a production loan—continued to turn out more important films than the major studios, although the surviving majors made enough notable blockbusters to cover the costs of less successful films.

Magazines felt the full brunt of television in the 1960s. The once popular *Colliers* died in 1957. By the mid-1960s, the *Saturday Evening Post* was in deep economic and editorial trouble, and after publishing bi-weekly for several years, the Curtis Publishing Company stopped it in 1969. Many people said that television had stolen the audience for the mixture of fiction and fact that had made the *Post* a popular giant for over four decades. Then the two major picture magazines, which had started within a year of each other in the mid-1930s, ceased publication within a year of each other three decades later. *Look* went first, followed in 1971 by *Life*. The circulation was there nearly till the end, but advertisers had lost confidence in national general circulation magazines and thought that television would do them more good at less cost. Some national magazines tried to appeal more to advertisers by not renewing subscribers in poorer rural counties, much as CBS had killed its rural-oriented programs in 1971 (see 9.63), but to no avail. Magazines became specialized, with the *Reader’s Digest* being the only general circulation non-newsweekly magazine to survive into the mid-1970s. *TV Guide*, with its many regional editions and 1977 weekly circulation of approximately 20 million, was the nation’s most popular magazine.

Newspapers faced increasing economic problems, only partly caused by radio and television taking away their late-breaking news role—the “extra” edition had virtually disappeared by the end of the 1950s—and television taking much of the entertainment function. In city after city, dailies died—New York’s seven metropolitan dailies of 1961 had shrunk to three by 1968—generally to the benefit of advertisers who with one or two papers could cover the audience that once had been split among many. The soaring de-

mands by labor unions, justifiably worried over technological unemployment, and the escalating costs of newsprint discouraged many publishers and investors. Business-oriented publishers raised their papers' daily price to readers and advertisers and then, as circulation and net profits dropped, killed them off or merged them. Some new suburban dailies and weeklies bucked this trend.

The increasing media competition and the corollary cost rise contributed to a trend to media conglomerates in the 1961–1977 period, particularly in the book publishing industry, which had been generally removed from group ownership in the past. By the mid-1970s, several media empires had major holdings in print and broadcast media and often in film as well. It was argued that it took economies of scale to meet competition from other huge media empires, demands of large advertising agencies, inflation, and the costs of labor. The cost was loss of diversity in content, fewer outlets for advertising of new products or services unable to meet the price, and fewer jobs.

9•92 *Television around the World*

Two major developments were the coming of color and the use of communications satellites for news transmissions (see 9.1 and 9.64). By the 1970s, most of the developed nations of the world had color television. Unfortunately, three systems were in competition for adoption: the American NTSC, the German PAL, and France's SECAM. The Western Hemisphere and Japan adopted the U.S. standard; Great Britain and most of Western Europe adopted the German system; and France, the U.S.S.R., and much of Eastern Europe, partly for political reasons, took the French system. Great Britain began color transmissions late in 1967. Canada

had begun the year before, although an estimated 50,000 Canadian sets had been tuned to colorcasts from south of the border before this. Japan and other Far Eastern countries quickly became the major sources for the world's television receivers. By the 1970s, more television sets were in use outside the United States than in it.

Transistors and then integrated circuits made radios smaller and more rugged, and their low cost and lack of need for power lines brought domestic broadcasting to many underdeveloped countries for the first time. Radio's low cost and ready access to rural areas made it a widespread ingredient in successful developmental communication in Africa, Latin America, and Asia. Developing nations that introduced television frequently supported it by advertising, and typically placed a single station in the capital city more for prestige and the pleasure of the ruling elite than for service to the public. American television programs and radio shows were popular, but toward the end of this period some countries established regulations limiting the showing of foreign import programs in order to protect their own artists, industry, and cultural independence. Even Canada passed strong laws to limit U.S. television advertising, programs, and other media influences that were considered harmful to the Canadian culture and media industry. Because of the language difference, Mexico was not as directly affected as Anglophone parts of Canada by U.S. stations. Indeed, Mexico had by the late 1960s become a major program source for the rest of Latin America and even for Spanish-language television stations in the United States.

9•93 *Period Overview*

As the title of this chapter suggests, this 15-year period saw more evo-

lution than revolution for the media. FM radio and cable television grew to importance. Yet, at the same time, commercial television and AM radio also continued to grow. Public (formerly educational) broadcasting became a matter of national policy and achieved national impact for the first time. UHF and pay-TV continued as discussion topics, although diminished in importance.

Major issues in the 1960s and 1970s included financing of public broadcasting, the amount of advertising on both radio

and television, the content of ads specifically aimed at children, violent program content, bias or suspected bias in broadcast journalism, responsibility for regulating broadcasting, political influence in the regulatory process, the increasing potential of cable television, all the issues surrounding the Fairness Doctrine, economic—and political and social class—concentration of ownership in broadcasting and other media, and a gnawing concern that broadcasting would serve the public's needs better if the public would express

Key Broadcasting Indicators: 1965 / This is the eighth of ten tables offering comparable information over a 50-year period (to 1975), presented at five-year intervals. Sources for items 1–6 and 11 are the tables in Appendix C, while other information comes from sources indicated below. Most data are for January 1.

Indicators	AM	FM	TV
1. Number of commercial stations	4,019	1,270	569
2. Number of noncommercial stations	ca 25	255	99
3. Total stations on the air	4,044	1,525	668
4. Number of network-affiliated stations	1,302	na	516
5. Percentage of commercial stations affiliated with networks	32%	na	91%
6. Total industry revenue (add 000,000)	\$917	\$25	\$2,515
7. One-hour station rate (New York)	\$600	na	\$10,200
8. One-minute station rate (New York)	\$175	na	\$3,000
9. One-hour network rate, evening	\$12,587	na	\$146,400
10. Number of broadcasting employees	..... 62,207	.....	47,753
11. Percentage of families with sets	97%	ca 40%	93%
12. Broadcasting regulatory budget (FCC)	.....	\$16,911,000	.....
13. Total FCC personnel	.....	1,502	.....

Notes (see Appendix D for full citations)

na = not applicable or not available

7–8. WNBC radio and television stations in New York.

9. NBC radio (209 affiliates) and television (197 affiliates) networks.

10. Radio figure covers both AM and FM stations and networks. Lichty and Topping (1975), page 290, table 23.

12–13. FCC figures for fiscal year 1965, ending June 30.

some interest. Few of these issues were clearly resolved by 1977, as the number of "players" in the broadcast issues arena and the economic stakes kept increasing.

The era began with an obvious major change in the FCC, as it went from years of complacency and even acquiescence to a period of strong regulatory activity. Relatively few issues were decided, however; diversity and confusion typically won out over clear-cut decisions and trends. The history of the next half-cen-

tury of American broadcasting will be far harder to write and understand, though lessons from the past will still tell us something of the probable future.

Further Reading

The best starting point for a description of American broadcasting in the mid-1970s is Head (1976), while Mayer (1972) provides a fine analysis of televi-

Key Broadcasting Indicators: 1970 / This is the ninth of ten tables offering comparable information over a 50-year period (to 1975), presented at five-year intervals. Sources for items 1–6 and 11 are the tables in Appendix C, while other information comes from sources indicated below. Most data are for January 1.

Indicators	AM	FM	TV
1. Number of commercial stations	4,267	2,184	677
2. Number of noncommercial stations	ca 25	413	185
3. Total stations on the air	4,292	2,597	862
4. Number of network-affiliated stations	2,165*	na	568
5. Percentage of commercial stations affiliated with networks	50%*	na	84%
6. Total industry revenue (add 000,000)	\$1,308	\$85	\$3,596
7. One-hour station rate (New York)	na	na	na
8. One-minute station rate (New York)	\$200	na	\$6,000 [30 sec]
9. One-minute network rate, evening	\$1,450	na	\$163,600
10. Number of broadcasting employees	65,000	6,100	58,425
11. Percentage of families with sets	98%	74%	95%
12. Broadcasting regulatory budget (FCC)	.....	\$24,562,000	.....
13. Total FCC personnel	.....	1,537	.....

Notes (see Appendix D for full citations)

na = not applicable or not available.

4–5. *The increase in radio network affiliates was due to the 1968 inception of four ABC networks. While one was for FM stations, a separate FM figure is not shown here as many FM stations were affiliated with other networks. There is no consistent source for such information.

7. By this time, station rate cards seldom listed such a price. Full hours were sold only by special arrangement.

8. WNBC radio and television stations, New York.

9. NBC radio (220 affiliates) and television (215 affiliates) networks.

10. Radio figures cover both AM and FM stations, and networks. Lichty and Topping (1975), page 290, table 23.

12–13. FCC figures for fiscal year 1970, ending June 30.

sion's issues and problems, and Cole (1970) offers 69 useful articles from *TV Guide*. Broadcasting in the 1960s is briefly analyzed in Summers and Summers (1966) and in Barnouw (1970, 1975).

Broadcast advertising practices are dealt with in detail in Heighton and Cunningham (1976), the first detailed textbook on the subject in 17 years. See also Owen (1975). Broadcast management is the topic of Quaal and Brown (1975) and Johnson and Jones (1972). An overall analysis of

economic constraints and issues in television is in Noll, Peck, and McGowan (1973), one of the most important policy books on broadcasting in years. For material on ownership, see books on regulation below. The literature on cable communications is huge (see below for regulatory material), but the best overviews are Baer (1974) and Smith (1972) while pay-TV schemes are discussed in Kamen (1973).

Just as public broadcasting grew in this period, so did books about it. The Re-

Key Broadcasting Indicators: 1975 / This is the last of ten tables offering comparable information over a 50-year period (to 1975), presented at five-year intervals. Sources for items 1-6 and 11 are the tables in Appendix C, while other information comes from sources indicated below. Most data are for January 1.

Indicators	AM	FM	TV
1. Number of commercial stations	4,407	2,636	711
2. Number of noncommercial stations	ca 25	717	241
3. Total stations on the air	4,432	3,353	952
4. Number of network-affiliated stations	2,458	na	617
5. Percentage of commercial stations affiliated with networks	55%	na	87%
6. Total industry revenue (add 000,000)	\$1,980	\$309	\$5,263
7. One-hour station rate (New York)	na	na	\$10,700
8. One-minute station rate (New York)	\$250	na	\$6,000 [30 sec]
9. One-minute network rate, evening	\$1,600	na	\$163,615
10. Number of broadcasting employees	68,800	12,900	62,300
11. Percentage of families with sets	98%	na	97%
12. Broadcasting regulatory budget (FCC)	.....	\$46,759,000	.....
13. Total FCC personnel	.....	2,022	.....

Notes

na = not applicable or not available.

4-5. The great increase in radio network affiliates was due to the continued expansion of the four (post-1968) ABC radio networks. While one of those was for FM stations, a separate FM figure is not shown as such stations were increasingly affiliated with all networks. A consistent source for such data is lacking.

7. Full hours were sold only by special arrangement.

8. WNBC radio and television stations in New York.

9. NBC radio (232 affiliates) and television (219 affiliates) networks.

12-13. FCC fiscal year figures for 1975, ending June 30.

port of the Carnegie Commission (1967) is crucial to an understanding of post-1967 policy and problems. Koenig and Hill (1967) gives a good view of ETV in the 1960s, Macy (1974) discusses the early years of national PTV development and its problems, and the annual statistical analyses issued by Corporation for Public Broadcasting (1970–date) are the best single source of year to year data on all aspects of public radio and television. Wood and Wylie (1977) detail public and instructional telecommunications.

Books on broadcast programming are few. Brown (1971) discusses the 1970 season from a network point of view, *The Eighth Art* (1962) comments on program issues of the early 1960s, and Owen, Beebe, and Manning (1974) discusses the economic constraints on network television content. Cantor (1972) reviews the role of the television producer, while Whitfield and Roddenberry (1968) is the best case study of a program series (*Star Trek*). Johnson (1971) gives a popularized analysis of how television affected sports. Miller and Rhodes (1964) offers a wryly amusing review of trying to get a program on the air, and Terrace (1976) provides the best directory of the television network programs for the period. Television journalism is more than amply covered, the most interesting of a long shelf being Epstein (1973), which discusses behind-the-scenes factors in television network news, particularly with respect to the Vietnam War. Barrett (1969–date) reviews television journalism quality, Bluem (1965) offers a fine analysis of early television documentary, and Chester (1969) is one of many books covering political broadcasting, in this case through the 1968 election. Small (1970) provides a network executive's view of television news, both process and problems. Braestrup (1977) offers a detailed analysis of television and print media cov-

erage of the Vietnam War's Tet offensive of 1968. Material on audience response is harder to find, but see Steiner (1963) and Glick and Levy (1962) for still valid analyses of viewing habits and audience types, and Bower (1973) for the results of a 1970 national survey compared to Steiner (1963) a decade earlier. For the best report of the Surgeon General's Committee major research on television violence and television, go to the official report (1972) and for additional information, to Comstock (1975) or Cater and Strickland (1975).

For an understanding of the regulatory issues of the post-1961 era, Gillmor and Barron (1974) is a useful guide, a law book placing broadcast regulation into context with other media. Krasnow and Longley (1973) gives a good short up-to-date review of broadcast policy-making in Washington, including some case studies, while Johnson (1970) provides a statement for further citizen interest and action. Barron (1973) gives one view of the "fairness versus access" controversy. Increasing concern over allocations of spectrum are discussed by Levin (1971). Material on cable regulation abounds: the best history-analysis is Le Duc (1973), while Seiden (1972) and Rivkin (1973) also have value. Material on broadcast ownership also is becoming more common: see Rucker (1968), Cherington, et al. (1971), and Seiden (1974) for partisan views of the issues, and Baer, et al. (1974) for a more objective overview of problems and research. The WHDH decision and how it came to be is the subject of Quinlan (1974). The latest general legal casebooks emphasizing broadcast regulation are Franklin (1977) and Jones (1976).

World broadcasting is discussed in United Nations Educational, Scientific, and Cultural Organization (1975), broadcasting in Africa is dealt with in Head (1974), Paulu (1967, 1974) discusses European

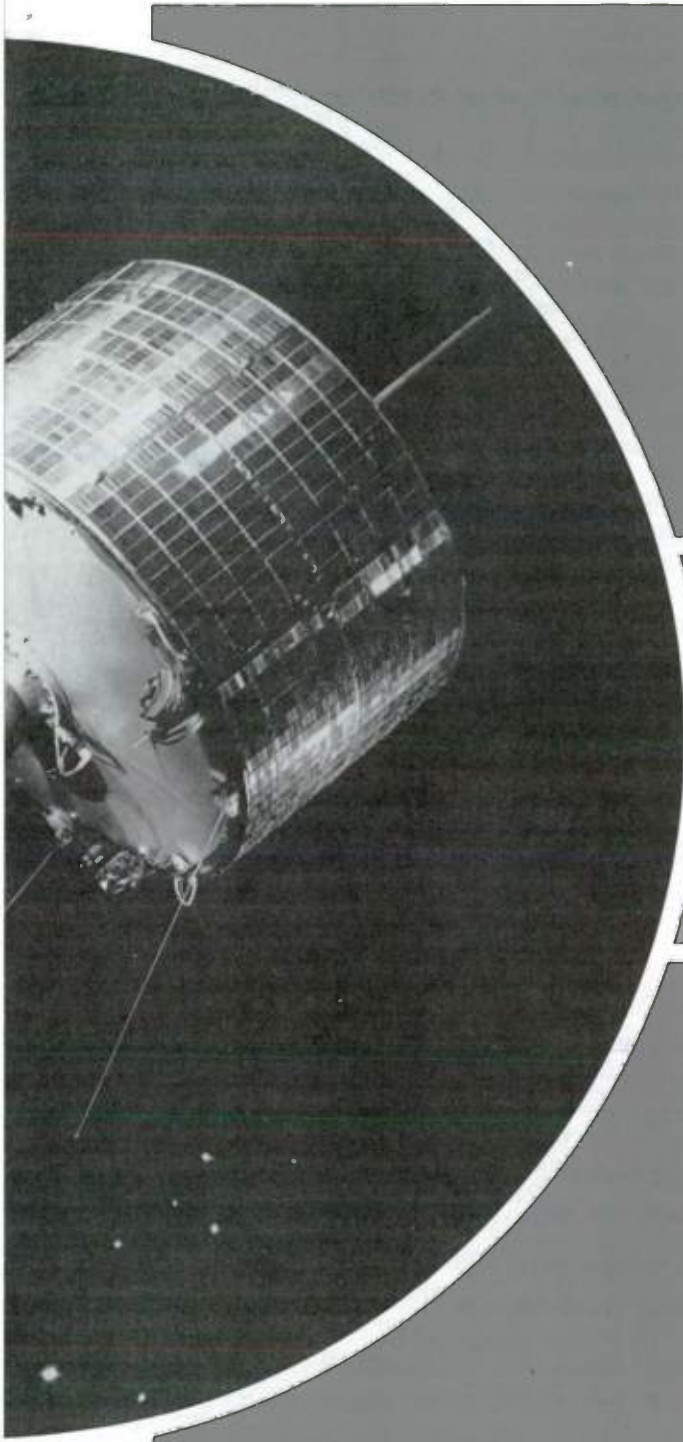
broadcasting, *Instant World* (1971) covers Canadian telecommunications, and *BBC Handbooks* (annual) are the best overview of British broadcasting when combined with the annual ITA (since 1972, IBA) *Guide to Independent Television*. Discussions of world television development are found in Dizard (1966) and Green (1972).

A detailed annotated bibliography of broadcasting publications is to be found in "A Selective Guide to the Literature of Broadcasting" in Head (1976). Although the *Journal of Broadcasting* is still the major source of current research findings, researchers into American broadcasting also should consult numerous other journals.

Lessons from
the Past for
the Future

100

"Those who cannot remember the
past are condemned to repeat it."—
George Santayana, Life of Reason



Lessons from
the Past for
the Future



"Let us judge of what can be done
by what has been done."—Jean
Jacques Rousseau, Social Contract

In more than a century of technical development and more than a half century of actual broadcasting, some patterns have become evident. Broadcasting, whether as a business or industry, an art, an application of technology, an embryonic profession, an establishment or institution, or a social phenomenon—and it is all of these, and more—has roots in the past, which we can use as precedent. Yet all too often, since broadcasting started, potentially valuable decisions, actions, or general lessons have been either ignored or forgotten in the heat of “new” controversy.

It is now time to pause and consider the overall patterns of developments in American broadcasting in the hope that such patterns, principles, or trends will provide useful guidance for the years ahead. Our purpose in this summary chapter is twofold: (1) to identify patterns, themes, or concepts from the past which help explain *why* things happened as they did, and (2) where possible, to suggest implications, guidelines, or lessons for the future. We are aware of the pitfalls of prediction, particularly in rapidly changing broadcasting, since history is not truly cyclical, and perhaps we have erred on the side of caution.

The sections of this chapter parallel the internal structure of most previous chapters: the difficulties of technological innovation, the development of local broadcast services led by national networks, the evolution of educational and later public broadcasting, advertising and other financial support and economic competition, program cycles and programming, the changing size and behavior of the audience, governmental policy and regulation including self-regulation, and the social role and impact of American radio and television.

Outline:

Lessons from the Past for the Future

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10·1 Difficulties of Technological Innovation

Not all aspects of technological development or innovation are strictly technological. One must consider the differences between invention and innovation, which often indexed the success or failure of important pioneers; the interwoven concepts of “not invented here,” national security, and economic nationalism; the battles over a finite amount of usable spectrum space; the industrial or governmental research team as contrasted to the individual inventor; the search for common standards for any new device; the varied roles of government in technological innovation; and the economic and marketing system into which an innovation is introduced.

The first theme is the difference between the conceiving of something, which requires engineering or scientific skills and luck, and successful introduction of that invention into use, which requires financial, promotional, legal, and marketing skills—and more luck. The number of inventors in this field who died broke—one even died of malnutrition—testifies to the need for a sound business head at the stage of innovation. Armstrong, an inventor of outstanding talent, was a successful innovator until he tangled with RCA over FM. Marconi and Alexander Graham Bell had good business managers, but Fessenden, de Forest, Stubblefield, and others never had enough good fortune or entrepreneurial skill to innovate successfully.

Another principle is “NIH,” the “Not Invented Here—so forget it!” syndrome that has led to the disregard of inventions from other countries or even from other laboratories in this country, and the

consequent waste motion of duplicated effort. Allied to NIH is the desire of all countries to control their own telecommunications systems, for national security and for economic nationalism. This attitude can have technological or regulatory effects as well as economic, as in the U.S. Navy’s objection to sale of the Alexander alternator to British Marconi or in the parallel development of telecommunications devices in various countries. Analogous to this early radio policy—which has been modified because of the need to coordinate frequency usage around the world—is the current desire for self-sufficiency in sources of energy.

Yet a third principle is concerned with political realities as well as technology. The need of radio communication services for frequency spectrum space has led to many tradeoffs between technical efficiency and financial economy. At first, equipment could be imprecise, inefficient, and inexpensive, because spectrum space was plentiful. As spectrum space grew scarce, communication services required more sophisticated and expensive equipment. But with broadcasting, the investment by the general public in receivers designed for older bands or standards interfered with technological advancement. No congressman seeking reelection could allow the FCC to render obsolete all those expensive receivers in his constituents’ living rooms! Television, for example, has been “frozen” into essentially the same technical standards that were adopted in 1941.

In most technical fields in the past half-century, invention has been in the hands more of industrial or governmental laboratory teams than of the individual inventor. Such radio inventors as Fleming and Alexanderson worked for large cor-

porations even in the early 1900s, but others—Marconi, Fessenden, Farnsworth, de Forest, and Armstrong—worked essentially alone. Apparently in telecommunication the increased complexity of technology and the enormous cost of continuing research now favors team effort generally supported by large companies. While there is still a place for the small company with an excellent product, it is no accident that the transistor came from Bell Telephone Laboratories and color television in its present configuration from RCA. The videotape recorder, first produced by the then very small Ampex, nevertheless required more than a decade of financial support by a variety of foundations and corporations for its development. Very few companies can afford to manufacture, let alone design and develop, a full line of broadcasting equipment, and even fewer are willing to take the risk. Economic pressures on even the largest companies seem to have steered them toward applied rather than pure research. Even this applied research rarely is applied to items that would not be immediately profitable, such as high-quality UHF tuners for television sets, until attention is focused by governmental regulation or other external factors.

Two interconnected principles guide the adoption of inventions. First is a search for common standards or specifications for any new device; second is the drive by each major company to have a commanding patent control position for products built to that standard. Sometimes this latter policy is rejected, as when Philips of the Netherlands allowed all manufacturers to use the audio cassette patents in an attempt to build up that industry, but the more common pattern is demonstrated by the drawn-out battles over the patents for the telephone, the vacuum tube (Flem-

ing versus de Forest), the regenerative circuit (de Forest versus Armstrong), FM radio (Armstrong versus RCA), television camera tubes (RCA versus Farnsworth), and so on.

These battles sometimes shaped entire industries: the attempts to innovate standards for mechanical scanning television before electronic scanning was perfected, the development of color television, the plethora of standards for disc and magnetic recording. Because the legal, laboratory, and public-relations battles are so expensive and lengthy, frequently only the largest corporations are able to join in. The risks are large, but so are the rewards: once the FCC or the public puts a stamp of approval on a technical standard, it is extremely difficult for a new technical approach to enter the market. Only when the government intervenes on the side of innovation, or a company such as Phillips decides not to exploit a patent position, does the field open up.

The role of government in technological innovation is important and many-faceted. Congress appropriated monies that enabled Morse to build the first electrical telegraph line and, through NASA, financed the development of space communications satellites. The government administers the patent system. During both world wars, the government created the conditions for a tremendous burst of activity in industrial laboratories designing and building war-related devices. The navy-administered patents pool during World War I showed how industrial cooperation might be established in peacetime, and World War II research opened up vast reaches of the electromagnetic spectrum. At the end of World War I, the navy, already a major customer for radio equipment, was instrumental in the establishment of RCA by GE and others. Some-

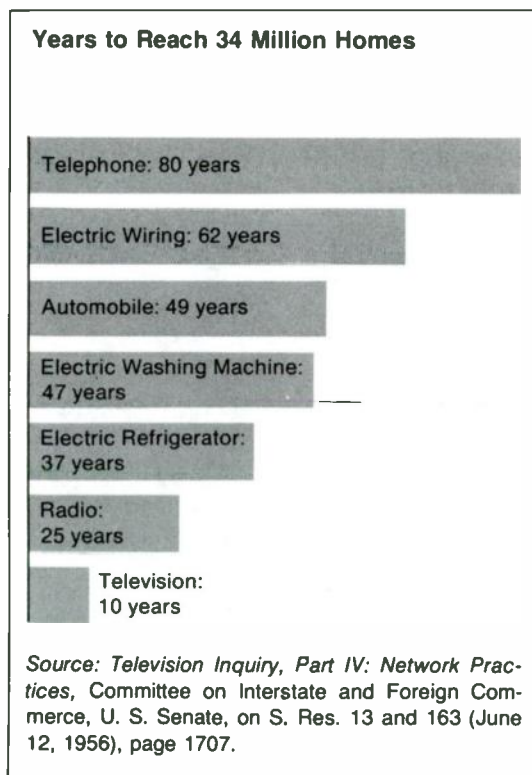
times government acts *against* technological innovation by yielding to the source of greatest pressure, frequently the existing establishment, as when the FCC used regulatory activity or inactivity to delay innovating FM radio and cable television.

The innovation of broadcasting equipment in the studio and at the transmitter was much more conservative than in other telecommunications fields, principally because the public was satisfied with the status quo and offered no financial incentive to change. Thus, transmitters grew more efficient and powerful but not essentially different. Studio control equipment became more flexible and more complex as both a reflection and a precursor of programming flexibility and com-

plexity in both radio and television. Adoption of solid state equipment was speeded only when broadcast station management realized the cost savings inherent in it. The advent of color programming in the late 1960s required the purchase of new and expensive equipment but did not lead to many programming ideas.

The story of broadcast studio technical innovation is replete with production people enjoying new toys but wondering how they could use them to communicate more effectively. One exception was magnetic recording. In radio, recordings progressed from inferior techniques banned from the networks to virtually omnipresent means of programming. Tape permitted nearly random access to program segments not possible with discs. In television, while film could be edited, until the advent of videotape all nonfilm programming was live. With VTR, the programmer could edit, store, and rearrange at will—although losing some of the spontaneity of live production. When wedded to lightweight portable color television cameras, the new generation of VTRs permitted true electronic newsgathering (ENG).

The broadcasting receiver industry also has been cautious about adopting new technologies, but for political reasons as well as economic. Billions of dollars' worth of receivers in millions of voters' homes causes tremendous political inertia. However, manufacturers are also rarely willing to sponsor research or tool up for production unless they see a chance to steal a march on the competition or must catch up with it. Voluntary industry research and development of UHF tuners that would meet standards of quality more easily obtained on the VHF have been minimal. The expansion of color television came only after black-and-white television had reached nationwide saturation.



The broadcasting field has demonstrated evolution and not revolution in its technology. The trials of FM radio after World War II illustrated how little happens when backers of an innovation try to label an industry and its technology as obsolete. Success for any future innovation will take either powerful economic backing and acceptance of its standards by most of the industry, for their own economic reasons, or strong political pressure to allow a direct approach to the public, as in pay-TV by cable. New technology is most likely to come from big companies able to support generally conservative approaches to research. Some small companies have built "better mousetraps," but the investment in production is almost prohibitive. The

public may benefit from innovation and from economies of scale and production—solid state television cut repair costs drastically—but generally, technological innovations *per se* make little difference in the content and effects of broadcasting.

Although the future shape of broadcasting is unknown, it seems likely that the new technology—including home television projection, time base correctors that permit the use of inexpensive VTRs on broadcast channels, digital rather than analog transmission systems with inherently higher signal quality, broadband cable, as well as such earlier devices as cable, communications satellites, home video systems—will affect broadcasting politically as well as economically.

What Will the Future Hold? / Although the technology of television production and transmission has evolved rapidly, changes in the home—except for color—have not been so apparent. Even the mini-boom, in the 1970s, in "large screen" projected television (not to be confused with "hang-on-the-wall" television picture tubes—only inches deep—that laboratories have worked toward for years) is but a reflection of truly large screen theater television, which dates back at least to Alexander's successful demonstrations in the early 1930s (below).

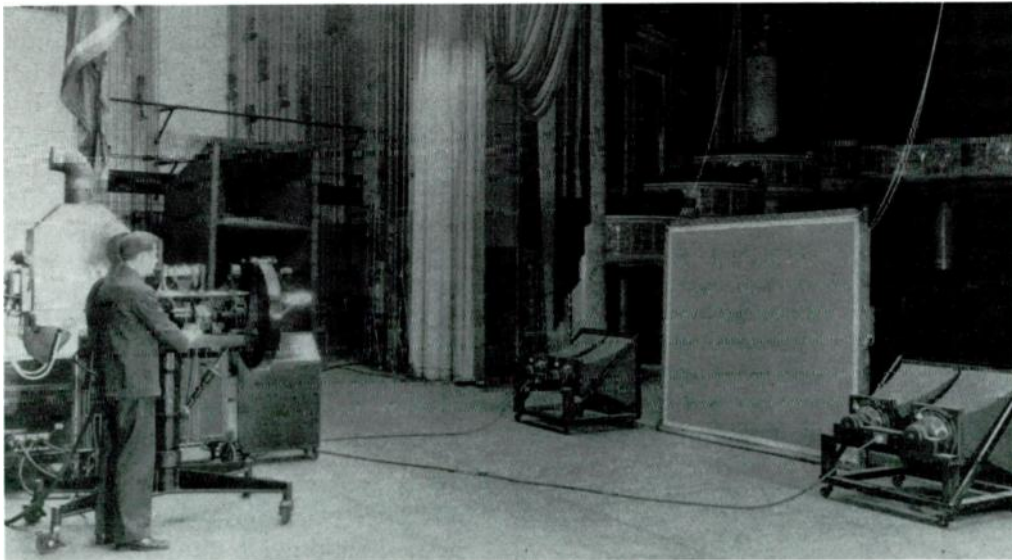


Photo courtesy of General Electric

10·2 A Local Station Service . . .

From the start, the FCC's practice of granting licenses to local radio and television stations has been basically inconsistent with the national character of networks and advertising. Responding to an American political principle, it has not only licensed the local station as the provider of services to the specific community but has made almost every broadcast transmitter a separate "station" and applied regulation to this station rather than to the national networks and advertisers. To ensure local expression, furnish advertising facilities for local businesses, and assuage congressional fear that a handful of companies might dominate the media, the FCC

has limited the number of stations a licensee can own and thereby made the local station a force in its geographic or social community. In times of crisis or disaster or local political activity, only local newspapers or broadcasting stations can program the necessary communication. But broadcasting stations, unlike newspapers in the United States, give service over legally, politically, and technologically determined areas and thus potentially can make money from larger areas than newspapers (see 10.5). Networks can cover the nation instantly.

Although economies of scale led radio broadcasting from wholly locally owned and programmed stations to a controlling system of national networks (see

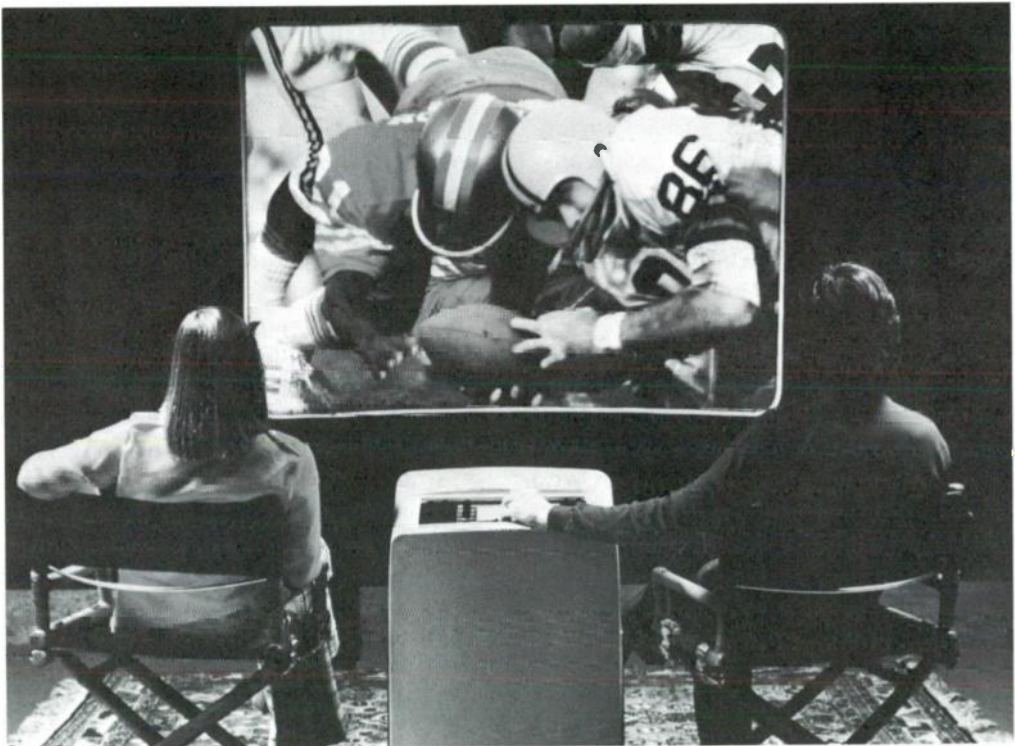


Photo courtesy of Advent Corporation

10.3), after World War II the pendulum swung back. With network executives preoccupied with television and thousands of AM and FM stations on the air for the first time, local radio programming control resurged. Actually, the demise of network radio has given only an illusion of local programming, since formulas, imitation, and a limited number of national music program sources predominate. Although there is some news and talk, particularly in markets large enough to accommodate such minority programming profitably, radio today *is* what David Sarnoff called a “music box” some sixty years ago.

Television stations play the same programs at similar times in most areas (see 10.6), and most television programming is dominated by the networks. The few independent (non-network affiliated) stations usually use old network programs now in syndication for much of their programming, making the material on the screen look older, not local or different. The result, for both radio and television, is a national service from lots of local transmitters. In addition, the FCC has permitted absentee and group ownership of stations, which means that station ownership is not always the same as local community management. Those who control stations in many different markets do not have to owe special loyalty or service to any single community, although many hundreds of stations, usually smaller ones in smaller markets, have conscientious operators who are as much a part of their communities as the traditional small-town newspaper publisher supposedly is. The result of this pattern is diversity in number but not necessarily in service.

Another important theme is the continuing tension between the haves and the have-nots in broadcasting. Since broadcasting is an industry, among other

things, those already doing well have an essential economic reason for discouraging competition. AM radio and VHF television station licensees became the broadcasting establishment. AM radio resisted both FM and television, but when the financial potential of television became evident, farsighted AM licensees often started television stations. Pre-Freeze VHF stations epitomized this development. Both AM radio and VHF television shared several attributes: they generally had been successfully established long before the directly competing FM and UHF services were introduced, they received the most revenue, and they controlled the industry’s trade associations—and to a great extent, still do. Advertiser acceptance, network status, and audience following belong to the older and generally more powerful AM and VHF services even in the mid-1970s. Any new competing service—FM radio, UHF television, pay-TV, or cable television—or governmental regulation threatening the livelihood of these stations is strongly attacked. The older stations logically enough tried to keep the newer services from full development by political and economic pressures or by purchasing them and containing the competition.

In recent years new classes of have-nots have appeared outside broadcasting—but wanting to get in. These are minority groups that lack funding to purchase a station or, because of the startling growth in stations—ninefold in the past 30 years—suffer from the shortage of channels on which to build new stations. Local community-supported stations and cable operations are looked down upon by more traditional broadcasting stations. Successfully innovating a *new* broadcast service against an entrenched and uncooperative industry is even more difficult than gaining a foothold in the existing service.

The truism that “them that has,

gets" holds particularly true in broadcasting. The earlier stations, founded by persons willing to take the risk of pioneering, achieved financial success; and the resulting economic status led to local and national political power often used to perpetuate that status. In such circumstances, both the haves and the have-nots feel ill-used. The clear implication is that any new service can succeed only by overcoming opposition of the existing industry. Frequently, economic resources, programming, and talent are hard to get, and the new service struggles for public recognition and acceptance. Without that acceptance, manufacturers are unwilling to bend and advertisers ignore the new medium. Other means of financial support are sought but have rarely been successful on a national scale. Some longtime media people have suggested that radio and television as we know them are already obsolete and will disappear within a decade or two in favor of what others term "blue sky" proposals such as the "wired city." We do not think that this will happen: the investment in the status quo by the public and by broadcasters is too great for the existing system to be junked overnight. But *if* some new and exotic service fills a public need or wish, change will come . . . probably slowly, marked by some accommodation between the new service and the existing industry. If it does not fill a public need or wish, no matter how much ballyhoo there is—as broadcast facsimile discovered—the new medium is unlikely to succeed.

10•3 . . . with National Networks

The most important thing about networks is their sheer dominance of broadcasting's programming, economics,

and even public image. Over the years we have seen problems of haves and have-nots in the networks, their varied roles as carriers of others' programming, their increasing use of Hollywood, their great caution in accepting change, and difficulties of establishing new networks.

Since their formation in the late 1920s, the networks have dominated audience loyalties. Their chief strategy, economy of scale—more affiliates, in larger markets, to reach larger audiences and thus command greater advertiser income—has led to bland programming (see 10.6) designed to appeal to the largest possible audiences (10.7) and to please essentially cautious advertisers (10.5). Each network tries to be all things to all viewers or listeners, and each is extremely wary of innovative programming, but each is willing to jump on the bandwagon when another makes a successful venture. In this way cycles of programming, spin-offs, and an occasional successful programming innovation—such as careful scheduling of an entire evening of similar programs to attract and retain a similar audience or the mini-series—develop. As long as national advertisers are attracted, the networks are content. This successful strategy has become a model for local stations to follow in programs, formats, and advertising, although some profitably engage in counter-programming.

Radio networks in their heyday of the 1930s and 1940s and television networks since the 1950s all repeated the old motion picture industry pattern of centralized financial control in New York with production facilities in Hollywood. This split has led to many of the same money versus creativity conflicts that occurred in the major Hollywood studios. Networks have a stronger control over their product, since they essentially control the national distribution system even though most pro-

grams technically are produced by independent packaging agencies. In radio and early television days, New York and Chicago also were major production centers for national programming, but today the Los Angeles area is the center for almost all but news and public affairs programs and some serials.

The two oldest networks, NBC and CBS, represent the establishment. ABC, founded later, was the weakest financially and until it jumped ahead in the mid-1970s, the weakest in programming as well. In radio, Mutual and other networks were either regional in concentration or generally affiliated with smaller stations. In television, CBS and NBC quickly dominated the industry, leaving ABC behind for a quarter-century. The Dumont network did not survive past the mid-1950s, and another fourth network attempt failed in 1967. CBS usually could move faster than NBC in such matters as the "talent raids" in the late 1940s because broadcasting was the keystone of the corporation's business whereas NBC was only a small part of the much larger RCA.

There are regulatory and technological as well as economic reasons for limiting the number of television networks. Technologically, there are fewer markets with three commercially assigned channels than there are with two channels, placing ABC in an endless position of playing "catch up" ball. Since far fewer markets have four channels, any fourth network would have a much smaller potential audience than the three major networks. Even existing fourth channels frequently are UHF channels with less coverage than their competitors on the VHF band. Although the networks are often blamed for encouraging this scarcity of competition by fighting against VHF *drop-in* channels in top markets, national

policy has long reflected technology rather than economic pressure: drop-ins would cause interference to existing stations and irritate viewers of those stations. Since the networks had the foresight many years ago to build or buy stations in the largest markets, this reasonable policy has been a source of economic benefit. Until recently, the networks as such rarely made much profit, but the five network owned-and-operated stations in large cities have been extremely profitable all along.

Because the Communications Act does not provide for direct FCC regulation of the networks, they have been regulated through their affiliated stations and such devices as the duopoly and multiple ownership rules. For many years, a network could control the affiliate's programming through a one-sided contract giving the network an option on the station's time. The networks claimed they were doomed in the early 1940s when the FCC limited radio option time, but they remained strong. The same outcry, with the same lack of result, has happened several times since, when television option time was eliminated two decades later and in the 1970s also, when the FCC promulgated the Prime Time Access Rule (PTAR). Although many object to the concentration of national programming in so few hands, one may also argue that the networks are the only institutions—other than a tiny handful of newspapers and national news wire services—that have the fiscal and political strength to support national newsgathering organizations.

From the late 1920s into the early 1950s, networks acted almost as a common carrier, providing distribution for programs produced or controlled by advertising agencies and often having only a limited say in program content or scheduling. Although this was a comfortable

relationship during radio network days, the networks had to take over the programming function when rising television costs made developing and producing programs too risky for advertisers or advertising agencies. This trend quickened as escalating costs led to a drop in sole sponsorship, and the development of alternate or multiple sponsorship led to an even greater loss of advertiser control. Eventually, the networks found it cheaper to farm out much of their program production to package agencies, notably West Coast movie studios, which were suffering from a drop in feature motion picture attendance and production partly caused by television. The only exception was network news. For the reasons discussed in the preceding paragraph, as well as for prestige, and for supervision of content in fear of libel suits, the networks themselves had always controlled news. By World War II, radio network news had become a chief means of informing the public. Television news, starting as little more than a newsreel, quickly achieved the status of the most used and believed national news medium. Indeed, the three national commercial television networks and the two wire services, AP and UPI, are virtually the *only* national news sources for most Americans.

It is not surprising that networks are the most cautious part of the broadcasting industry. They are accused of running a closed shop, encouraged by their general economic success achieved by appealing to a low common denominator in programming. They are rarely interested in program ideas from outside that do not fit into a mold developed in their own headquarters. The competitive scheduling of network programs has become a high art with the trappings of a science. The programming chiefs rely heavily not only

upon rating services but also upon the track record of major packagers such as Desilu (*The Lucille Ball Show*), MTM (*The Mary Tyler Moore Show*, *Rhoda*), and Tandem (*All in the Family*, *Sanford and Son*), whose spin-offs from successful series they prefer to new program ideas from new sources. It is unlikely that this pattern will change until or unless new means of distributing programs are developed, such as "temporary" sports networks or "first run" syndication such as *Mary Hartman, Mary Hartman*, or channels are provided to support more than three national program services.

Although the networks are the obvious target for critics of broadcasting's real or imagined shortcomings, and are prone to complain at the slightest interference in their activities, they have done extremely well financially. They lost one-tenth of their income—perhaps \$200 million—when cigarette advertising was banned, citizen group pressures reduced the income from children's programs, the Prime Time Access Rule forced them to return much prime-time inventory to their affiliates, and election campaign reforms reduced election time revenues substantially. They are greatly restricted in their ownership of programs, including a ban on syndicating them in the United States. Yet, they still make huge profits, and a Westinghouse (Group W) petition to the FCC in late 1976 was motivated in part by a desire of at least some network affiliates to get a greater slice of this network financial pie. The symbiotic relationship between network and affiliated station has proven to have more merits than demerits for all concerned. However, without the profits of their O & O stations, it is doubtful whether the networks could do as well for themselves, advertisers, program producers, affiliates, and the public.

10•4 Educational or Public Broadcasting

The development of educational radio and later public television took place in the face of limited public knowledge of or support for such a system, the indifference and even hostility of commercial broadcasters, regulatory caution based on political fears, and the overriding question of financial support—and consequent probable control of content.

The key theme running through this story, however, is the lack of agreement on what public broadcasting was to do for its listeners. From the start, educational broadcasting was held up as the greatest potential educational force the world has known. Such a platitude has currency, particularly as the common definition of “education” has broadened. But should public broadcasting be an alternative to commercial radio and television?—a chance for education in the home or expansion of university adult education programs?—an adjunct to in-class instruction?—a general cultural service?—a locally oriented service, or a national one?—controlled by the community, the educational establishment, or counterculture organizations? Should it emphasize opportunities for minority-interest programming, or should it be a fourth national network? The goals of this kind of broadcasting have been as varied as the names applied to it: “instructional,” “educational,” and “public”—or “cultural,” “community,” and “alternative.”

This vagueness of national purpose and dearth of financial capitalization have intimidated and confused the leaders of public broadcasting. From the beginning, educators have failed to grasp opportunities; they have set their sights low and have been subservient to those in government and elsewhere who might have

been good allies but turned out to be less helpful as masters and leaders.

Approximately 200 noncommercial AM radio stations in the 1920s shrank to a couple of dozen by the late 1930s. Apparently once the glamour of the new medium wore off, fiscal caution and the apprehension of classroom teachers who feared for their jobs were sufficient, in a depression, to choke off funds needed to upgrade facilities to FRC standards and continue operation. During the 1930s and 1940s a few educational broadcasters kept alive the dream of regaining access to broadcast channels in every community. Commercial broadcasters were using most of the AM channels previously and briefly occupied by the educators and, in spite of commercial broadcaster assurances to Congress that they would provide adequate time for education, fulfillment of the dream had to wait until educators won reservations on FM channels in 1940 and television channels in 1952. Although the initial beneficiaries were equipment manufacturers rather than students or the general public, educational broadcasting, still confused about its purposes, slowly grew out of the “demonstration” stage.

The lack of common goals led to a corresponding lack of public concern. As a result, political and economic pressure was never mobilized to support ETV; the lack of money was a symptom more than a cause of its malaise. Despite all the rhetoric, ETV never has attempted to be an alternative to commercial entertainment. Only with movies or high-quality drama, much of the latter from Britain, and some children’s programs have public television stations been able to garner substantial audiences. Listeners and contributors have continued to come largely from a narrow spectrum of society. One can argue that these are the decision-makers and movers of society, but this group already is well

served by other media. Public broadcasting is not yet a medium for the general public and will become so only if it makes its goals clear, receives support with fewer strings attached, and stops the nearly constant internal bickering and political in-fighting.

In England and many other countries, the publicly controlled broadcasting system was established as an instrument of national policy long before commercial broadcasting was allowed. In the United States, commercial broadcasting became primary (see 10.5) and educational broadcasting had to subsist on crumbs. This existence was self-defeating, because there never was enough money to produce the programming and promotion that could lead to general public support. A few municipalities, school districts, and universities doled out a few dollars each year until the late 1950s, when outside agencies offered help. The Ford Foundation had demonstrated cultural programs to the general public first over commercial channels and then through the National Educational Television and Radio Center's affiliates. In 1967 the Carnegie foundation's report proposed a new name, public television, and a new vision and generated enough pressure on Congress for the government to establish the Corporation for Public Broadcasting, with tax support for equipment and programming.

Yet, public broadcasting still is hampered by restricted funding, lack of a long-range funding plan, and political influence on decision-making. Congress and other politicians object to tax monies going to independent programming supporting various political and social views. Accordingly, noncommercial educational radio stations are legally prevented from editorializing or endorsing political candidates, and local pressures frequently are even more severe. Educational broadcasters,

willing to do almost anything to get money, have found that "He who pays the piper calls the tune." They have also found that a promise to supply money is not proof of money forthcoming. A decade after the original Carnegie Commission report, and as a new commission was appointed, a long-range funding plan isolated from short-term political pressures is still in the offing. Internal dissension remains. Public television is called elitist, yet its role of providing programming not generally supplied by commercial television is recognized. Cautious governing boards of local public television stations are at loggerheads with the alphabet soup of national organizations. Government remains ambivalent. Yet, all-in-all, public television is now so "successful" that it suffers from many of the problems of commercial stations—which now view it as competition to be fought rather than as a related public service to be supported.

The future of public broadcasting is unclear. With the support of tax and foundation money, there is little danger that it will blow away. On the other hand, the immediate future appears to hold few programs with the public appeal of *Sesame Street*, more bickering over a limited financial pie, and continued in-fighting among competing organizations. Only when those in public broadcasting can confidently sell a substantial portion of the general public on clearly defined goals and aims, will this medium become more than a stepchild to commercial radio and television.

10•5 Economics of Broadcasting

In spite of initial attempts to find other means of financing broadcasting, strong debate over the propriety of broadcast advertising in the mid-1920s, and con-

cern over some aspects of it since, advertising has been the chief support of American broadcasting since the late 1920s, and radio and television, in turn, have become major advertising media. This situation has affected program content and production, widened the differences between the haves and the have-nots, and helped establish different roles for today's radio and television.

Because most U.S. broadcasting is advertising-supported, programs are only a means to an end: attracting advertisers to the audiences attracted to the programs. Programs become bait to gather audiences, which stations and networks then sell to advertisers. Thus programs tend to be mass entertainment, with education and information—news and public affairs—always receiving just enough time to assure good public relations. Mass programming generally is bland and politically neutral, aiming to offend as few as possible while entertaining as many as possible. Program content appeals to a low common denominator so that the largest number can enjoy it—and attend to the supporting advertisements. Some major companies are even moving into “noncommercial” public television by giving grants in exchange for a brief mention at the open and close of popular PBS programs.

In the United States, following the initial sale of commercial time in 1922, the rush to adopt this method of financing carried all before it. Other approaches—license fees on receivers, as in Great Britain; tax revenues, which support some municipal and university stations today; subscriptions, as for the Pacifica stations; donations, as for community-sponsored public television stations; operation as auxiliary enterprises by receiver manufacturers—were rarely considered. By 1928, radio had become a mass advertising medium, and in the 1930s and 1940s the larger

advertising agencies virtually controlled radio network programming.

Although the networks had to take over the programming function as rising television costs turned off advertising agencies, advertisers still could veto the content of most sponsored programs. This changed when the quiz show scandals of the early 1960s forced networks to supervise programming more strictly in order to protect their affiliated stations. At the same time, the cost of sponsoring an entire program had risen beyond the capacity of most sponsors. As a result, broadcasting slowly adopted a modified “magazine concept,” which allowed advertisers to buy spots without sponsoring programs—advertiser support without complete advertiser control.

This system has shaped American broadcasting. Most national advertising goes to larger stations and to the networks partly because of the convenience of using only one large outlet instead of many smaller ones. Local advertisers, unable to afford the prices charged national ones, must use smaller and less efficient independent stations or fringe time on larger ones. Independent stations, often with poorer technical facilities, such as UHF, must face large, fixed operating costs on the smaller amounts of money generated by local advertising.

Competition in radio and television is restricted by the interaction of advertiser desire for efficiency and the technological factors that limit the number of networks and make most smaller stations inherently and permanently inferior as advertising media. New systems of distributing entertainment and information to the American public—FM, UHF television, CATV, pay-TV, and home video recording—are automatically and immediately under attack by existing industries and their supporting trade organizations and press,

co-opted governmental officials, and others anxious to retain the status quo. Once a new medium or approach has won a long, expensive struggle to get public or government support or approval—as, for example, the all-channel receiver bill helped UHF—the battle has just begun. Now it must start the *marketing* fight against those stations or other institutions that hold an economic advantage.

Although one-quarter of all television stations are noncommercial, most broadcasting will remain supported by advertising in the near future. However, the potential profits to be gained from pay-TV—“by the program” direct charges to viewers and listeners—are bound to be attractive to entrepreneurs in the long run.

10•6 Programming

Since broadcasters sell advertisers people rather than programming, programs are the bait used to attract this audience. As a result, programming is a reflection of rarely conflicting pressures from advertisers; different governmental regulations, which, in turn, reflect congressional and public concerns; varied audience familiarities and preferences; and the profit-and-loss interests of broadcast station managers. Out of this background comes programming standardization and a cyclical, largely imitative development of this standardization.

The needs of networks and other time constraints led to standardized program lengths, generally in 15-minute increments except that television used 20-minute periods briefly in the 1940s, and radio of the early 1920s and since 1960 has been more free-form. The formats of programs, with few exceptions, are restricted by the need of networks to insert into the program a certain number of commercials

at exact times, often determined by computer or previously distributed schedule.

Similarly, success of some early programs led to a standardization of types of shows. The various musical, variety, drama, comedy, and game formats all were common by the late 1930s, and most radio and television programming since then is a modification and adaptation of them.

For a number of reasons, there was and is little program experimentation. First, a medium that constantly reaches so many people is bound to have a shortage of real talent and new ideas. Vaudeville performers were shocked to see routines that might have lasted a lifetime on the stage gobbled up by radio in days or weeks. Second, few advertisers wish to risk supporting non-conventional programs, since the stakes are so high. They generally must appeal to the largest possible audience without antagonizing parts of it. Third, costs and risks are rising. Radio programs were cheap to produce; even television of the late 1940s rarely cost more than a few thousand a week for a network show. But by the mid-1970s an hour of prime-time programming could cost more than one-third of a million dollars. When these risks are added to the natural tendency of established networks, advertising agencies, and production studios to perpetuate accepted methods, it is no wonder that programmers follow conventional ideas and copy successes rather than innovate creatively.

But, every so often, frequently in unsponsored sustaining time or on public television or in another country or medium, one program or idea becomes popular that is a bit different from others of its genre; less often a producer will support a program that is substantially different, and once in a while the gamble pays off. Immediately other networks come out with close copies, in a process of imitation which continues until the ratings of that type of

program begin to decline. By that time, another program format—game shows, detective drama, something else—is on the upswing of *its* cycle. Generally, it takes from one to four seasons for a program type to run its course, and some types have returned to popularity every “TV generation” of 10 to 15 years.

Within a given program type there is even more standardization. It has been said that there are only 15 major literary plots, and it is clear that television and radio drama have used and reused them so often that they have become nearly as conventionalized—with stock characters, pacing, and plot—as the lengths or genres of programs themselves. Most avid television watchers can predict the outcome of a program or subliminally know when the plot is building in suspense and interest toward a commercial interruption. This familiarity becomes a comfort to persons who use television strictly as entertainment. Since even those willing to use TV for more than relaxation and entertainment are unwilling to do so *all* the time, low audiences for public television and the need to sugarcoat the programs result.

Hence, the very sameness of broadcasting is one of its greatest strengths. Rather than responding to the audience’s presumed or possible needs, broadcasting tends to cater to its desires, which are reduced to the limited choice of programming aired. Since much of the audience finds change uncomfortable and stability welcome, broadcasters and advertisers use these attitudes to establish continuing audience preferences and habits.

Local programming is rare. When the networks appeared, local formats for both radio and television rarely could compete except by copying network programs. A half-dozen radio formats of today have no network counterparts—since radio networks no longer provide large amounts of

programming—but have a similarity from market to market. In television, in spite of the Prime Time Access Rule, the term “local origination” generally means that off-network syndicated programs or films are being shown with local commercials.

Although most programming is directed to a mass audience, increasingly sophisticated advertisers are well aware of the *demographics*—data on audience composition for a given program—which will allow them to groom their messages for a particular audience. As a result, prime-time programming is generally aimed at housewives from eighteen to forty-five, who make or determine most consumer purchases.

The chief exception to this is news programming. Not only do broadcasters believe that they get “brownie points” from the FCC for programming news and public affairs “in the public interest,” but a sizable minority of the public feels a need to be well-informed. Therefore, the local news often supplies a major share of local, as opposed to national spot, television station revenues. But even here the approach is traditionally standardized. In radio it may be “rip ‘n’ read” superficiality torn from the AP or UPI wires; on television the network newscasts may be virtually indistinguishable except for their individual, highly paid anchormen and -women and gimmicks suggested by consultants such as “happy talk” interaction between anchors. Except for a few aging holdovers from a brief period of radio network commentary around World War II, caution and objectivity are highly maintained. Editorials are bland, and the limits on time and cost restrict what might be done on the evening newscasts; reactions to each infrequent controversial documentary usually make it harder for network news executives to persuade their own programming chiefs to allow them to prepare the next

documentary. Many outstanding works have been aired, but there is some justice to the complaint that the networks spend huge amounts of money for sophisticated hardware and personnel to report the news—including excellent coverage of the space program, political events, the assassinations of the 1960s—but very little time or money to supply interpretations or implications of the news—information a citizen needs to make valid decisions in a democracy. Although the amount of time devoted to straight news has grown, the question remains after five decades: what is the proper balance between the industry's legitimate interest in a reasonable profit and the public's legitimate interest in news and public affairs programs?

The economics of a mass audience, paramount in an advertiser-supported medium, also may be valid in media supported by subscription or purchase. What little evidence we have indicates that pay-TV, cable, videocassettes and video-discs, and similar developments promoted as offering greater diversity of content than broadcast television, will find it most profitable to continue the pattern of mass entertainment programming to get the most buyers at the least per unit cost.

10·7 And What of the Audience?

The public interest, the desires and needs of listeners and viewers, is paramount in American broadcasting—according to politicians, the Supreme Court as of the 1969 *Red Lion* decision, broadcasters speaking before Congress or at public meetings, and almost everyone else. Yet, because of the commercial orientation of most broadcasting, the needs of advertisers often come first when determining program schedules.

Members of the audience generally have been passive, with a few recent exceptions in the form of small activist citizens groups. Voluntary feedback—calls or letters—is rare but frequently effective. Research shows that most viewers are content to let the experience wash over them with little overt reaction, from changing channels to discussing a program with a relative or a friend. Broadcasters and advertisers have relied on “head counting” research—the ratings—to determine the popularity of programming. The claim that the public is “satisfied” with current broadcast fare has some validity, even though the public has no choice beyond that which the networks and stations provide, and even though a small minority may constitute millions of citizens.

The growing sophistication of advertisers and the increase in stations over the years has led to a redefinition of “mass communication,” particularly as applied to radio. The many highly specialized stations of today have loyal but relatively small audiences attending to a specific type of programming. Advertisers, quickly realizing that a “class” audience with interest in their product or service might be far more desirable than a much larger but indifferent “mass” audience, have geared their time buying accordingly. Ratings and other research services had to develop techniques that would determine the demographic characteristics of the audience for each station or program, even on the still mass-oriented networks, so that advertisers could match their efforts to potential customers.

Observers do not agree on the effects of broadcasting on its audiences. Since the mid-1950s concern about the effect of televised violence on children has elicited a series of congressional hearings and millions of dollars' worth of research, resulting in several schools of thought on the

issue. But the research had to be stimulated from "outside"; broadcasters were unwilling or unable to determine broadcasting's impact. People spend more time with radio and television than with almost any other activity, but the theoretical constructs and objective data to determine the effects of such attention are not yet available. Broadcast time salesmen use a great deal of research, much of it self-serving, to convince advertisers that radio or television would be the most persuasive medium for selling goods and services, but very little definitive research occurs on passivity or violence or other hypothetical effects. Broadcasting, like all other stimuli, can provide a learning experience, but just what is learned and by whom, with what effect, is not understood even after decades of speculation and a growing amount of academic and broadcaster-sponsored research.

The industry, fearful of change, recognizes that "commonsense" approaches to the problems that program emphasis on violence and sex may cause in children is bound to lead to governmental restrictions, or even public-relations-conscious advertiser boycotts. The few cases of an imitative violent act in real life following a violent act on the screen rarely show a direct cause-and-effect relationship on close analysis. In cases that seem to show a relationship, it usually can be shown that the person had exhibited abnormal tendencies previously and that Wilbur Schramm's conclusion that "some kinds of stimuli have some kinds of effect on some kinds of people" still holds. Yet, this does not satisfy those who believe that the mass media are to blame for most of the world's evils. To forestall more onerous regulations, some broadcasters have advocated self-regulation, which culminated in 1975 with "Family Viewing" restriction of violent programs in the early

evening. Although some broadcasters blame this development for a general drop in prime-time ratings, and there is a general disregard of the millions of children who watch television after nine o'clock and of the many violent scenes on the evening news, it is doubtful that this will be the last action taken in this matter. Furthermore, as the FCC said in the 1964 Pacifica case, the airwaves are not wholly for the inoffensive and bland. There are many things that are pathological about today's society and world, and broadcasting—the messenger—is an obvious and vulnerable target . . . and weapon.

Nevertheless, these potential negative effects of broadcasting rarely bothered most of the public. To them, getting higher-quality receivers at reasonable cost and picking up a distant signal with an entertaining program were far more important. Static mattered more than sociology, and big-name entertainment was more important than high culture. This self-generating cycle supported the economic rationale (see 10.6) for limiting programming experimentation. Most people wanted to be entertained; even at the height of World War II or during a moonshot, complaints flowed into stations about news cutting into favorite shows. News and documentaries had low ratings, and when combined with the unpopularity of the war in Vietnam, it is no wonder that networks shunned this sort of special programming.

Furthermore, in an interrelationship with technology, the public generally demands programming *before* investing in receivers and other expensive entertainment devices. Although free enterprise purists suggest that competing devices or standards be allowed to fight it out in the marketplace, neither the public nor the manufacturers are willing to take the risk of investment in devices that may not be

adopted. So, everyone waits until the government or a united industry determines technical standards and specifications—except in the field of audio disc recordings, where the “battle of the speeds” proved to be a bloody one—until there is sufficient color programming to warrant purchase of other than a black-and-white set, and so on. Even today, the questions of standards for stereo AM and quadraphonic FM radio, videodiscs and videocassettes, are open—waiting, in the final analysis, for the public to commit itself.

The audience role, although passive, is essential. It supports advertisers who support programming. Although there are increasing research, increasing congressional interest, and a few activist groups trying to improve the system, most citizens, virtually addicted to media that did not exist a few decades ago, relax and watch and listen.

10•8 Regulation and Policy

Running throughout broadcasting’s history is a search for the meaning of the elusive “public interest, convenience, and/or necessity.” Promulgated in the 1927 Radio Act and continued since, this is the phrase on which all regulation of broadcasting rests, yet it never has been satisfactorily defined either by Congress, which thought it up, the FCC, which has to administer under its terms, or the courts, which have had to deal with the result.

Another factor that must be considered is the FCC’s reluctance to regulate. Possessed of neither clear prerogative jurisdiction, nor sufficient information on which to base decisions, nor the power to enforce them, this politically sensitive body traditionally has ignored problems, and no wonder. In recent years, the Court of Appeals for the District of Columbia has over-

turned a number of FCC decisions, further reducing the incentive to make them. Although many participants in the regulatory arena practice delaying tactics in order to maintain the status quo for their own advantage, at the commission delay seems virtually a goal in itself. Even so, the inexorable trend, since the first laws were passed in 1910 and 1912, has been toward greater government supervision. The growing body of case law precedent, the interest of Congress in anything that closely affects the interests of its constituents, and the accretion of cases and policies into formal doctrines have established a situation where many broadcasters now feel narrowly circumscribed. Recent feeble attempts at deregulation by the FCC have done little to reduce this feeling.

Except at the very beginning, the broadcasting industry has always agreed that the less regulation the better. The chaos caused by unrestricted competition prior to 1927, in a field inherently limited by the strictures of the electromagnetic spectrum, was ended when Congress passed the Radio Act of 1927—with the enthusiastic approval of the general listening public *and* the broadcasters. As long as the federal role was limited to technical matters, such as clearing the airwaves of interference, most broadcasters had little objection to the new agency. But then, having cleared up most technical problems, in the self-perpetuating nature of most bureaucracies, the FRC and later the FCC moved into areas affecting programming in order better to serve that ill-defined “public interest.” From then on, a low-grade war raged between untrammelled enterprise and bureaucracy.

In its four decades, the commission—as opposed, often, to its staff—has varied between “leaning tower of Jello” accommodation with or even subservience to the industry and mutual antagonism,

which built to a peak with the 1946 "Blue Book" and to another peak during the period of FCC activism that started with Chairman Minow's "vast wasteland" speech in 1961 and continued through Chairman Henry and Commissioners Cox and Johnson's assaults on the broadcasting industry. Although no major revisions in law or regulation resulted from these activities, the climate has changed, and broadcasters no longer possess the informal control over the commission they long held.

In evaluating the government's role in broadcasting, it is well to remember that the agencies—Congress, FCC, OTP and its successors, various levels of courts—are not monolithic. They are composed of a changing cast of human beings with varied goals. Commissioner Johnson's interest in eliminating cross-media ownership has a very different philosophical base from President Nixon's attack on the ownership of television stations by the *Washington Post*, which opposed him. Over the years, each group has changed, and the laws, regulations, and policies have reflected these changes as well as changing conditions. Behind the scenes, however, were "the staff"—the generally unknown congressional committee aides, FCC senior civil servants, and politically oriented technocrats of the OTP—who had their own goals, and a great deal more continuity than their elected or appointed superiors. Most of these people worked conscientiously in the public interest, but their length of tenure often froze their points of view, including a tendency to protect the status quo.

Although current controversies occupy our attention, they are seldom truly current. Most regulatory problems have been around a long time; some have needed two decades for a decision. Precedent often becomes so encrusted that the

various sides in a dispute have difficulty finding new approaches to long-standing issues. Nevertheless, identification of some of the themes underlying today's "current problems" may help explain them.

One such theme is FCC concern over the ownership of broadcasting stations, stimulated and pushed by populist members of Congress. Restrictions were slowly instituted on multiple ownership in a given market, on cross-ownership between media, and on such other combinations as television station-cable ownership within a station's coverage area. The courts generally supported FCC—and Justice Department—activity in this area, starting with the 1943 Supreme Court's upholding the commission's "network rules," and similar actions in programming and economics.

Perhaps the FCC's most important and prominent donnybrook is the Fairness Doctrine, which started simply enough when the FCC decided in the 1941 *Mayflower* case that the broadcaster should not be an advocate. This was reversed in the 1949 *Editorializing Report*, which stated that the broadcaster could be an advocate if he provided opportunity for opposing views to be heard. As the years rolled on and the doctrine evolved case by case, it split into two parts: the right of the public to hear opposing views on controversial matters of public importance was incorporated in the Communications Act in 1960, and the right of those personally attacked during such a presentation for time to reply was incorporated in the FCC rules in 1967. The Supreme Court, in the 1969 *Red Lion* decision, upheld the Fairness Doctrine's personal attack rules. In 1967, the FCC ruled that stations broadcasting commercials for cigarettes should be required to provide free antismoking spots. The commission labeled this a unique situation because of the U.S. Surgeon General's report on the link be-

tween smoking and health. But, to the annoyance of financially wounded broadcasters and the FCC, a number of groups immediately seized upon this decision to demand time to respond to other commercials on consumerism or environmental grounds. The FCC with the aid of the courts tried to put the lid back on this Pandora's box, but citizen group pressure for access keeps the issue alive.

The Fairness Doctrine, which was intended to benefit the public by permitting airing of various opinions on matters of public concern, was a rallying point for activist citizen groups after 1964. They tried to use it and other regulations to achieve something different from fairness: access to the airwaves for persons who had something to say—in the way they and not the broadcaster wanted to say it. Best argued by attorney Jerome Barron, this concept led to “public access” channels for CATV in the 1972 rules and to continuing pressure on broadcasters in the form of petitions to deny license renewal. Congress and the commission, both believing that the Fairness Doctrine had gone too far, instigated hearings, revision proposals, and court tests of the doctrine's procedures—and even desirability. Post-Watergate election reform laws and rapid changes in the case law of libel have further confused the relations between public officials, the public, broadcasters, and fairness. In late 1977 these situations remain fluid.

Broadcasters, held accountable by the Communications Act, came to distrust the continual investigations, rule changes, and “harassment” by citizen groups, many of which had financial support from tax-exempt foundations or governmental agencies. The government seemed increasingly to guide the licensee and take away his final say over material broadcast over the stations. The FCC, itself under

pressure and almost continual—since 1940—investigations by Congress, tried to walk in the middle of the road, refereeing confrontations between broadcasters and organizations of listeners, but to the dissatisfaction of both sides. The commission's usual tactic of delay proved ineffectual as citizen groups found their way to the usually more receptive courts. When the WLBT decision gave citizen groups standing before the FCC, it broke the log jam and permanently expanded the list of participants in the regulatory arena.

In the 1960s and 1970s broadcasters found that their own causes were not getting anywhere. The cable television industry steadily was improving its lobbying ability before Congress and the FCC. Congress often toyed with the extension of license terms to provide greater broadcaster “stability” but, as of late 1977, had not passed it. The FTC, the antitrust division of the Justice Department, and other agencies developed popular antibroadcast ideas for increasing regulation of broadcast advertising and building intramarket media competition. Congress made increasing demands on broadcasters for the carriage of political campaigning and other matters. A federal shield law protecting the confidentiality of reporters' sources, and abolition of the American Bar Association Canon prohibiting cameras and microphones in courtrooms, got nowhere, even after broadcast journalism won justly deserved laurels for coverage of the Nixon impeachment proceedings in the House of Representatives. Indeed, even with a new Freedom of Information Act, access to governmental information, particularly in the courts, became more difficult. Such strictures as anti-job discrimination laws and a requirement that broadcasters survey community leaders and the public to ascertain the community's needs as part of the license renewal process—all added to

the mound of paperwork required of each licensee and his or her staff.

Although these increasingly complex regulations made broadcasters think that the commission was firmly in the citizen group ("enemy") camp, such was not the case. Some regulations were mandated by Congress, some were the product of normal bureaucratic expansion, and some were in response to real abuses of the public interest. The FCC's policy of delay fit in well with the goals of the broadcasting establishment of any given time. Commission action or inaction—as contrasted to commission rhetoric—generally favored broadcasters over outsiders, AM over FM, VHF over UHF, television broadcasters over cable. Only when the need for new services or technologies became overwhelmingly apparent did the commission approve stereo and nonduplication rules to help FM, support the all-channel set law to help UHF television, and loosen restrictions on pay-TV and cable. Even then, the new regulations seldom were even handed. Usually they protected the existing service; sometimes, as with cable in the mid-1970s, the new service; but always in the name of the "public interest, convenience, and/or necessity."

"Self-regulation" in broadcasting is a barometer of public concern over radio and television's role in society. Like most such industry self-regulatory efforts, the NAB codes are intended to influence public opinion. They have little policing effect, no matter how much effort is devoted to their wording. In broadcasting, with some exceptions—hard liquor advertising, "Family Viewing" time, and so forth—the codes are platitudes, often softened if the industry is in economic difficulties. Most important, only a fraction of the country's stations are members of the codes, many do not feel bound by them, and the only enforcement penalty is withdrawal of per-

mission to use the code's symbol or "seal."

Just as the regulators have had their bad moments—FCC members who were incompetent or dishonest—so has the industry: blacklisting, and the quiz and payola and plugola scandals. These become moments of high drama as laundry is washed in public and pious promises are made about better behavior in the future. But real reform seems rare.

Finally, it should be noted that there never has been a consistent long-range communications policy for the United States. The pressures of budget and day-to-day cases have restricted the FCC's long-range vision; Congress is too concerned with politically useful hearings and legislation, and lacks the staff and the continuity for such planning; and broadcasters are running businesses, not research centers. In 1951 and 1968, presidential commissions examined American telecommunication policy, but there was little continuity and most recommendations were ignored. When the OTP was formed in 1970, it seemed to be a step toward continuing policy research at a high governmental level, but it quickly was mired in politics and short-range goals. It is this lack of long-range, policy-oriented thinking that has led to reaction to recurring problems rather than anticipation of their recurrence, even though various foundations and the National Science Foundation have started to sponsor a great deal of research into telecommunication policy.

After more than 50 years of broadcasting and nearly 50 years of broadcast regulation, the controlling phrase "public interest, convenience, and/or necessity" remains undefined beyond that which the current political situation demands that it mean, and the result is regulatory confusion and lack of goals. The Communications Act is more than 40 years old, and it

does respond slowly to societal and political change. This uncertainty prevents stagnation, but also ensures that philosophical and operational regulatory problems will remain with us in the future.

The time is long past for continual application of ad hoc solutions to seemingly permanent problems. But both the industry and government agencies are understandably looking out for themselves, and the public interest sometimes suffers as a result. Concerted action by thoroughly prepared impartial citizens could change this pattern, but it would require much additional knowledge and funding. Past experience suggests that the desirable approach would be through research and policy initiatives supported by funds outside either bureaucratic or industry control. The potential for a "third force" in broadcasting is great, and action is clearly needed.

10•9 If There Were No Broadcasting?

In this book we have discussed the development and some of the effects of broadcasting in America. But what if radio and television and broadcasting had never been developed? How would life in this country differ? The answers to such questions suggest the overall impact of more than a half-century of broadcasting.

Even the smallest unit of social life, the family, would offer a substantially different milieu in which to grow up. Without broadcasting's socializing effect, the family would have a far more important social role than it has today. Family members probably would fill the long hours of leisure made possible by increased industrialization and mechanization with activities less passive than watching television. They might even do

more things together. Even with twentieth-century transportation and the telephone, localism would be more important for more of us. Home, school, church, and immediate community might have greater importance in the absence of views of the "greener grass" elsewhere in the nation and the world. Our personal and collective identities with community, city, state, or region rather than nation or world probably would have major consequences for the distribution and sale of retail goods. Education would concentrate more on improving literacy.

When we take away broadcast journalism, with its ability to tell us almost instantly what is happening almost anywhere at any time, we are left with newspapers that take many hours to publish admittedly more complete news, even when the event warrants an extra edition. While we would continue to read newspapers and magazines to learn about national and world events—and perhaps even see them, days later, in motion picture newsreels—we would find it much harder to identify with happenings so *far* away when it takes so *long* for the news to reach us. Lacking the cohesive force of broadcasting, regions of the country, let alone the world, would be far more different from one another than they are today. Fads and information on living and social styles would travel more slowly and penetrate less deeply when passed on only by print and film. Even our language would be different, as there would be no broadcast media to help eradicate regional dialects. Our knowledge of other regions, and of foreign countries, would be limited to memories of personal travel or to the images gained from the printed page, still photographs, and movies. Results of international diplomatic and sports meetings would take at least a day to reach us, and the latter would lose much of their thrill

reduced to print rather than “live” or videotape by satellite. Of course, the old, familiar sports, as played by local teams rather than distant, national leagues, would be preferred to exotic sports, such as many Olympic events, that have to be seen to be understood. In fact, without television coverage to pay for team transportation and huge player salaries, the organization of national sports would be very different. More seriously, the civil rights movement for minorities and women would have progressed much more slowly without the constant broadcast coverage of the past two decades. If there had been a war in Vietnam, our views of it would probably have changed more slowly—if at all. Other presidents might have been elected or Watergate more easily covered up. This alternative world would be unimaginably different.

Our entertainment would also be very different, particularly as it involves other media. The film industry would be thriving, and newsreel theaters might be popular. Recreational reading of magazines and books of all types would be greater. As mentioned before, there might be more activity and less passivity in the home, in the immediate community, and in social groups.

In addition to changes in lifestyle—generally, a slowing down of the introduction of new fashions and ideas—there would be substantial political and economic impacts from the absence of broadcasting. No longer could a political idea or a national leader mobilize or galvanize the entire populace in a day, particularly persons who cannot or will not bother to read about the day’s events. In the economic sphere, some products would suffer from the lack of broadcast advertising, and advertisers would be forced to use print or perhaps film media alone. The large pic-

ture magazines and probably the larger general circulation magazines, which have gone out of business in the last decade or so, still would be thriving as mass audience advertising vehicles, with circulations in the tens of millions. Advertisers probably would have more to say about the content of such magazines, in order to avoid offending potential consumers. The careers of show business personalities would rise and decline much more slowly. The recording industry would boom, although stars of the music field would develop more slowly than “overnight sensations.” On the other hand, many of the performing arts would achieve greater financial success through larger audiences.

Clearly, a life without broadcasting would be a very different one—even a throwback to the days before the early 1920s insofar as communication is concerned. Yet without broadcasting the world would not have stood still, and we cannot look back a half-century and say “That’s how it would be today, without broadcasting.” We can only resort to reverse futuristics, similar in some ways to taking the data in this book and extrapolating into the twenty-first century, with broadcasting.

Since radio and television *were* invented and successfully innovated, we need to look backward a bit in order to forecast the future intelligently. The coming of radio in the 1920s took the nation by storm and had substantial effects on print, film, and phonograph records. But, unlike the complete displacement of the horse-and-buggy by the automobile, these other media, particularly records, came back part of the way and lived in symbiosis with radio. Radio has taken over the role of the newspaper extra, but is not suited to disseminate the comic strip or the political cartoon, or serve as a medium of record. When television arrived in the late 1940s

and early 1950s, this dislocation was repeated. Radio itself, after less than twenty-five years, was virtually eclipsed as a national medium. For the past quarter-century television has been the dominant mass medium in the United States, with other media scrambling to find significant and profitable niches.

Television has carried an increasing proportion of national advertising and has given a majority of citizens most of their news; the motion picture industry is primarily its handmaiden, and the newsreel and the national weekly picture magazines have died. Minor league sports have all but disappeared in the face of major league television coverage; indeed, many teams and leagues were established solely because of expected television income. Television has given us moments of laughter, of high and low drama—including wars and the death of one President and the resignation of another—and extended our eyes and ears to the entire world and even to the moon.

Those born since 1950 have grown up with television. They spend several hours a day in front of the set and will spend more time with television than with almost any other activity. They make up the first television generations. The violence and sex, the beauty and laughter, the emotion and reason provided by its ambiguous mirror, which both reflects and projects, has affected and will affect them. They, in turn, will affect American society, including, in full circle, the broadcast media. The impact of broadcasting may not always have been beneficial, but it has been deep. To understand what has been heard and seen over radio and television over the past half-century is to understand American life better. As for the next half-century—

Stay tuned . . .

**A Short
Chronology
of American
Broadcasting**



**A Short
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Broadcasting**

This *very* selective chronology of highlights is divided into periods paralleling the chapters in the text and is restricted to what we feel are the most important events of each year. The material has been gathered and condensed from (see bibliography for full citations) Kempner (1948), Dunlap (1951), *Broadcasting* (1970, 1976), Barnouw (1966, 1968, 1970, 1975), Head (1976), and several unpublished sources of which the most useful was L. W. Lichty's "A Chronology of American Television to 1966" (unpublished).

**The Prehistory of Broadcasting
(to 1919)**

1725 Gray (England) discovers the principle of conduction by observing electricity carried several hundred feet through a hemp thread.

1753 An anonymous published letter (England) suggests wired communication with a wire connection for each letter of the alphabet.

1794 Chappe (France) devises optical telegraph system using signals on towers between major French cities.

1832 Morse (United States) develops basic sense of what will become his telegraph system and code.

1840 Morse receives telegraph patent applied for in 1837.

1843 Bain (Scotland) devises basic principles of transmitting pictures (later known as *facsimile*), much of it applicable later to television.

1844 First telegraph circuit, between Washington and Baltimore, is officially opened with message "What Hath God Wrought?"

1858 First underwater telegraph cable is laid across the Atlantic but works for only a few months.

1861 Coast-to-coast telegraph lines put 18-month-old Pony Express out of business.

1862 Caselli (France) transmits a crude image by wire between two towns.

1864 Clerk Maxwell (Scotland) theorizes existence of electromagnetic waves.

1865 International Telegraph (later Telecommunication) Union is founded.

1866 Atlantic cable is successful on third major attempt. • Loomis (United States) conducts wireless telegraph experiments in Virginia and sends signals about 15 miles.

1872 Loomis acquires world's first patent on a wireless system but fails to commercialize it for lack of funds.

1873 May (England) discovers that selenium can produce electricity in direct relation to amount of light received.

1876 Bell (United States) applies for patent on telephone device, then demonstrates same at Philadelphia Centennial Exposition.

1877 Edison (United States) succeeds in first audible reproduction of recorded sound—basis of phonograph and subsequent recording methods. Carey (United States) proposes bank of selenium cells, each with wire conductor to similarly arranged bank of lights on reception end, for crude means of picture transmission.

1880 Leblanc (France) suggests the principle of scanning to allow faster transmission of pictures using only one wire.

1884 Nipkow (Germany) patents the scanning disc with spiral of holes with which to scan and later reproduce pictures.

1885 American Telephone and Telegraph (AT&T) is formed from several earlier phone companies.

1887 Hertz (Germany) proves Clerk Maxwell theories in series of laboratory experiments.

1888 First photocell is developed, later of great importance to television.

1892 Stubblefield demonstrates his wireless telephone system.

1894 Jenkins (United States) begins experimentation with television system using mosaic system. Lodge (England) introduces and improves Branly (France) coherer as a wireless

detector. It becomes the standard for two decades.

1895 Marconi (Italy) sends wireless telegraph messages approximately a mile on his father's estate during initial experiments.

1896 Marconi arrives in England, demonstrates his improved system, and leads in formation of what will become in 1900 the "British Marconi" firm.

1897 Braun (Germany) develops cathode-ray oscilloscope as crude electronic display tube.

1899 Marconi sends wireless signal across English Channel. British and American navies experiment with several wireless systems. American Marconi, British-controlled subsidiary of main firm, is founded. • Wireless calls for aid bring about first rescues of crew and passengers from vessels in distress in European coastal waters.

1901 Marconi and aides send letter S across the Atlantic Ocean, suggesting long-range communication applications of wireless.

1903 Berlin is site of first international radio conference, which proposes greater cooperation in ship-to-shore communication.

1904 United Fruit Company begins to build its network of radio stations in Central America and Caribbean countries to coordinate banana shipping. • Fleming (England) patents two-element vacuum tube, or valve.

1906 Fessenden (United States) transmits voice and music program from transmitter at Brant Rock, Massachusetts. • De Forest (United States) develops three-element tube, called triode or Audion. • Pickard and Dunwoody (United States), among others, develop crystal detector—first inexpensive and easily duplicated detecting device. • Berlin is site of second international radio conference, which adopts "SOS" call and demands all companies and ships equipped with apparatus from various manufacturers to communicate with one another in emergencies.

1907 Rosing (Russia) receives a faint television signal by using Braun tube and adding photocells.

1908 Campbell Swinton (England) suggests a completely electronic system of television.

1909 Herrold begins broadcasts from San Jose, California, and schedules them regularly shortly thereafter.

1910 First United States radio law, Wireless Ship Act of 1910, calls for radio and operator on all oceangoing passenger vessels.

1912 *Titanic* disaster dramatically shows value of wireless as 700 of 2,200 persons are saved in midatlantic iceberg collision. • Second United States Wireless Ship Act requires two radio operators on all vessels at sea. A month later, Radio Act of 1912 provides first regulations for land radio stations and amateur operators. • De Forest discovers amplification potential of triode, which leads to AT&T purchase of telephone rights to three-element tube.

1915 Coast-to-coast telephone service established. • American Radio Relay League set up as association of amateur operators. • General Electric and British Marconi tentatively agree that GE will sell Alexanderson alternators exclusively to Marconi.

1916 De Forest broadcasts presidential election returns in Wilson-Hughes race. • Sarnoff files "radio music box" memo with officials of American Marconi, who are interested only in international and ship radio for private messages.

1917 United States enters World War I. The navy takes over radio transmitters—especially the Alexanderson alternators, the only reliable long-distance wireless transmitters—for the duration, or closes down facilities; establishes system until 1920 of indemnifying companies for patent infringement—essentially a patents pool—so that best equipment can be made for wartime use.

The Beginnings of Broadcasting (1919–1926)

1919 Navy continues control of radio facilities after war as battle rages over government's role in future of wireless; Congress holds hearings (May–June). • British Marconi resumes negotiations with GE for alternator, still demanding monopoly rights, but after navy intervention, GE forms RCA to safeguard American radio interests. RCA acquires rights to alternator (Oc-

tober) and assets of American Marconi, and enters into first patent cross-license agreement with GE (November).

1920 President Wilson orders navy to relinquish control of amateur and all other nongovernment radio facilities (March). • AT&T joins RCA-GE cross-licensing agreement in step leading to postwar civilian-controlled patents pool (July). • To outflank position of RCA, Westinghouse purchases two key receiver patents from Armstrong (October). To encourage sales of radio receivers, Westinghouse establishes KDKA in East Pittsburgh, based on experimental station 8XK run by their engineer Frank Conrad. Initial KDKA broadcast is of Harding-Cox presidential election returns (November).

1921 Westinghouse attempt to compete in international radio collapses as RCA has tied up most foreign contacts. Westinghouse joins RCA patents pool, splitting receiver manufacturing rights with GE 60–40. United Fruit joins pool (June). • Thirty broadcasting stations go on the air, including six owned by Westinghouse and others operated by GE and RCA. Only two frequencies (channels) are in use for broadcasting.

1922 Hoover hosts first radio conference in Washington, which calls for government regulation of radio technology, limited advertising, and classes of stations based on kind of service (February). With hundreds of new stations, Hoover adds new frequency for stations of higher power and high quality programming. First use of four-letter station calls (August). • AT&T enters broadcasting, seeing it as extension of toll telephone operation. First paid-for commercial announcement on WEAJ (August).

1923 Jenkins transmits unmovable facsimile silhouettes from Washington to Philadelphia by wireless (March). Zworykin (United States) patents iconoscope camera tube, key to an electronic television system. • Second radio conference reiterates suggestions and calls for temporary licensing guidelines until Congress will act (March). • Planning meeting in Chicago leads to formation of National Association of Broadcasters, to fight ASCAP demand for payment from radio stations for all music used on

the air and to seek government technical regulation. • Hoover announces three classes of stations and assigns greatly increased frequency spectrum, about two-thirds of current AM band, to two of them (June). • RCA enters broadcasting by taking over programming of Westinghouse's New York outlet and building a station in Washington and another in New York. The New York stations, WJY and WJZ, become major competition for AT&T's WEAF. • First multiple station hookup combines WEAF (New York), WGY (Schenectady), KDKA (Pittsburgh), and KYW (Chicago) (June). First lasting hookup between WEAF and Massachusetts station comes a month later. • Federal Trade Commission report, aimed mainly at RCA, criticizes monopoly in radio equipment and patents (December).

1924 First coast-to-coast radio program demonstrates use of telephone-line circuits and lays groundwork for planned national AT&T network, using WEAF as originating station (February). • Third and largest radio conference in Washington calls for broadcasting use of entire 550–1,500 kHz band and urges research into monopoly and station interconnection (October). • Competition between Telephone Group (WEAF and allied companies and stations) and Radio Group (RCA, GE, Westinghouse, and others and their stations) affects decisions on programming, station interconnection, patents, and equipment manufacture.

1925 Baird (England) gives public demonstration of mechanical (Nipkow disc) system of television by transmitting silhouettes (April). Jenkins (United States) sends first filmed (moving) images by wireless using mechanical television system (June). • Fourth and last radio conference in Washington agrees that limit on number of stations may be required, radio is not a public utility, and limited advertising is acceptable (November).

1926 Zenith case shows limits of 1912 act when federal court holds Secretary of Commerce cannot prevent firm from changing station frequency, thus wiping out Hoover's voluntary regulatory scheme. U.S. Attorney General releases opinion that Secretary of Commerce can only process license applications and not reg-

ulate them. With all controls ended, licensing of 200 new stations adds to interference chaos on the air (fall).

The Coming of Commercialism (1926–1933)

1926 Internal strife within industry is resolved as Telephone and Radio groups sign three-part agreement including provision that AT&T will drop business of broadcasting station operations (July). • RCA forms National Broadcasting Company (NBC) (September). NBC purchases WEAF from AT&T for \$1 million and begins regular broadcasting on NBC-Red, based on old AT&T chain of stations (November).

1927 NBC-Blue network, based on New York's WJZ, begins operations with 1927 Rose Bowl broadcast (January). • President Coolidge signs Radio Act of 1927, which creates Federal Radio Commission (FRC) (February). • New FRC orders stations back to frequencies assigned by Hoover and sets broadcast band at 550–1,500 kHz (April). • Columbia Broadcasting System (CBS) goes on the air with 16 stations for a long and shaky start-up period (September). • Ives (United States) transmits both still and moving pictures, as well as synchronized sound by wire. Farnsworth (United States) transmits first electronic television pictures. • Millions listened to radio coverage of Lindbergh solo transatlantic flight (May).

1928 Baird transmits television picture across the Atlantic and later demonstrates mechanical color television. Zworykin develops and patents a much-improved iconoscope tube. The FRC allocates several 10 kHz channels in the standard (AM) band for television. • Congress passes Davis Amendment to Radio Act, which calls for equality of radio service in five regions in the country (March). • Radio generally is becoming accepted as advertising medium, though it carries only 2 percent of all advertising this year. • FRC announces plan to allocate clear, regional, and local AM channels (August). • Paley buys control of CBS; is named president in early 1929. • NBC begins fulltime (but not 24-hour) coast-to-coast operation.

1929 In the Great Lakes case, the FRC analyzes what the public interest means for a broadcasting station. • National Association of Broadcasters issues a code of radio advertising and programming ethics (April). • Crossley's Cooperative Analysis of Broadcasting offers first system of network program ratings. • FRC becomes permanent body after several short-term extensions (December).

1930 Formation of conflicting National Advisory Council on Radio in Education and National Committee on Education by Radio. • Lowell Thomas begins national daily newscast, on NBC-Blue (and broadcasts regularly until May 1976). • RCA takes over GE and Westinghouse efforts in television as part of the reorganization of roles of each firm following antitrust action.

1931 Court upholds FRC denial of license renewal to Brinkley's KFKB because of past programming and personal attacks on the air (February). Appeals court dismisses appeal of FRC denial of Schaeffer license because of profanity uttered by candidate for public office; saying licensee is responsible (March). FRC rescinds license of Baker's KTNT in Iowa for personal attacks and other program matters (June) and of Shuler's Los Angeles station for personal attacks (November). The last decision is later upheld as not being improper government censorship. These four cases help solidify the FRC's right to examine programming for public interest. • Metropolitan Opera Broadcasts begin with Milton Cross as announcer (until his death in 1974).

1932 Radio reports the Lindbergh kidnaping, one of first tragedies covered on the air (March). • University of Iowa begins scheduled educational broadcasting with mechanical television (the station staying on the air to 1939). RCA initiates 120-line electronic television field testing. • GE and Westinghouse end long legal wrangle with agreement to sell all RCA stock; RCA, now fully independent, competes with former owners (November).

1933 First of President Roosevelt's famous "Fireside Chats" (March). • As newspaper-radio tensions rise, Associated Press limits sale

of news to local stations. CBS gathers network news on its own (April). • Biltmore Agreement between networks and news agencies eliminates independent radio reporting by networks (December). • RCA initiates use of Zworykin's iconoscope-kinescope combination and raises picture definition to 240 lines. • Armstrong receives the four key patents to new FM radio system (December).

Radio's Golden Age (1934–1941)

1934 Three independent organizations are established to gather and sell news for radio in fight against Biltmore Agreement (March). • Station WLW begins experimentation with 500,000 watts (until mid-1939) (May). • Roosevelt signs Communications Act of 1934 replacing FRC with Federal Communications Commission (June). • A new network, first called Quality and then Mutual, is started by owner and joint operator stations WOR, WGN, WLW, and WXYZ (September).

1935 RCA and Armstrong end cooperation over FM radio. Armstrong announces his FM system, and RCA achieves 343-line interlaced television scanning and announces million-dollar television research program (May). Armstrong demonstrates his FM system (November). • United Press and International News Service agree to sell news to radio stations and networks, marking effective end of Biltmore Agreement (May).

1936 Congress repeals Davis Amendment requiring equal radio service in five zones, thereby allowing for more stations and greater power in areas of high population (June). • FCC holds engineering conference and hearings on future of FM and television (June). • BBC (England) initiates regular television broadcasts comparing Baird mechanical with EMI-Marconi electronic systems (November). • New York to Philadelphia coaxial cable is tested (December).

1937 American Federation of Radio Artists (originally "Artistes"), a union for announcers and performers (later known as AFTRA), is formed (July). • In wake of chaotic Hauptmann

(Lindbergh kidnaping) trial, American Bar Association adopts Canon 35, banning radio, recordings, and photography in courtrooms (September). • FCC allocates 19 channels for experimental television (October), and Philco demonstrates 441-line television pictures.

1938 FCC makes first educational allocation in broadcasting, 25 channels in 40-MHz band (January). • First FM station, Armstrong's W2XMN in New Jersey, goes on the air (April). • Wheeler-Lea Act gives Federal Trade Commission right to curb false and misleading advertising (April). • Radio's reporting of month-long Munich crisis is first major use of shortwave for live coverage of international event (September). • Orson Welles's production of *War of the Worlds*, the most famous single broadcast, scares many listeners (October).

1939 Associated Press begins to supply news without charge for sustaining programs on NBC (February) and later begins to sell news (June), thus finally ending the Press-Radio war. • FCC issues a memorandum on 14 types of objectionable programming (March). • Unable to buy his patents, RCA signs television patent license agreement with Farnsworth. NBC starts regular television programming with opening of New York World's Fair (April). • New NAB code goes into effect: disallows liquor advertising or paid controversial ads, and limits all advertising to 10 percent of each hour (July). • Facing rising pressure from ASCAP for higher royalties, NAB establishes its own music licensing organization, Broadcast Music, Incorporated (BMI) (September). • BBC suspends television operations for the duration of World War II (September).

1940 FCC gives go-ahead for limited commercial television as of September, using 441-line standard (February), but rescinds order after RCA pushes receiver sales against FCC desires and understandings (March). • Radio correspondents provide regular reports from Europe at war, especially eye-witness accounts from Murrow in London, Shirer in Berlin and France. • CBS demonstrates its color television system—a mixture of electronic and mechanical methods (August). • Justice Department prepares antitrust action against ASCAP, BMI,

and radio networks for music monopoly (December); settled by consent decree in February 1941.

1941 Commercial FM radio operations are authorized (January). • FCC issues "Mayflower" decision, which is understood to eliminate licensee editorializing (January). • Nearly all stations change frequencies, many only slightly, as the North American Regional Broadcasting Agreement (NARBA) goes into effect between the United States, Canada, Mexico, and Cuba (March). • FCC issues Chain Broadcasting Report with eight important recommendations; most upsetting to the industry is requirement that NBC give up either Red or Blue network (May). • FCC approves commercial television with 525-line standard and FM sound—effective July 1. • CBS and NBC stations operate stations by the first day. • FCC begins two and one-half year investigation of press ownership of radio stations (August).

Radio Goes to War (1941–1945)

1941 Largest radio audience to date, estimated at 90 million, hears Roosevelt declare war. Amateur stations are closed down, and weather forecasts are limited for the duration (December).

1942 Wartime code bans man-on-the-street and ad-lib interviews, and most quiz shows (January). FCC bans construction of broadcasting stations in areas with primary (local) service (February) and freezes all station construction except for operations underway, to conserve war material. Receiver production is ended, and shellac, used in records, is sharply limited for civilian use (April). • President Roosevelt creates Office of War Information (OWI) and names newsman Elmer Davis to head it (June). • American Federation of Musicians, under new president Petrillo, announces no musicians will play for recording sessions—beginning of a long strike (August).

1943 Supreme Court upholds FCC's chain broadcasting regulations, forcing NBC to shed one network, forbidding exclusivity, and curtailing option time (May). • Congressman Cox

begins lengthy House investigation of the FCC (June). • E. J. Noble purchases the Blue network from RCA for \$8,000,000, and the FCC approves the transfer (October).

1944 FCC ends newspaper-broadcasting ownership investigation without drawing up new rules (January). • Networks allow FM stations to carry AM programs without extra charge to sponsors (January). • FCC holds major allocations hearings on spectrum above 30 MHz, concerned especially with future of FM and television (September–November). • Networks sign with Petrillo's AFM, on his terms, after an appeal from President Roosevelt fails to end strike. Two-and-a-half-year-old recording ban is ended (November).

1945 Blue Network becomes American Broadcasting Company (April). • FCC delivers television allocation of 13 VHF channels (May) and FM service is moved up to 88–108 MHz band (June). • The war ends, and the FCC begins to process backed-up station applications; receiver production is resumed; OWI is abolished (August); amateur bands are released to civilians (November).

Era of Great Change (1945–1952)

1946 FCC's "Blue Book" makes strongest statement yet on licensee's responsibility in public service programming (March). • BBC reestablishes television broadcasting with 405-line prewar standards (June). • RCA publicly demonstrates all-electronic system of color television (November).

1947 Strong anticommunist attacks on broadcasting include *Counterattack* newsletter and early blacklisting. • Zenith announces Phonevision system of pay-TV by wire, setting off two decades of experimentation and intense debate (July). • Over a period of several months, interconnection of television stations by both microwave and coaxial cable develops, connecting stations in both the East and Midwest (late 1947 through spring 1948).

1948 AFM lifts ban (begun in late 1945) on musicians playing for television or on AM-FM

simulcast programs (March). • Broadcast and nonbroadcast sharing of television channels is eliminated, but channel 1 deleted for other uses (May). • Scientists at Bell Telephone Labs demonstrate transistor (June). • NBC and CBS announce plans for major television network expansion by 1950. First ABC television station goes on air in New York (August). Midwestern AT&T coaxial cable network opens, linking existing stations from St. Louis to Buffalo (September). • After hearings on allocations (June–September), FCC orders Freeze on stations license applications for television, while it attempts to solve problems of interference and expansion space (September).

1949 Eastern and midwestern television networks are connected, linking 32 stations in 14 cities. First televising of presidential inaugural (January). • FCC releases report which allows stations to take editorial positions if they treat opposing views fairly—later seen as birth of Fairness Doctrine (June). • FCC disallows (after October 1) certain giveaway shows with jackpots as violations of the U.S. Criminal Code prohibition on lotteries. • FCC begins television hearings, initially concentrating on choice of color processes (September).

1950 FCC allows Zenith to test Phonevision for 90 days in Chicago (February). • Editors of *Counterattack* issue *Red Channels*, which leads to more blacklisting in radio and television (June). • Korean War leads to restrictions on civilian construction, including radio and television sets, although reduced production continues. • FCC approves CBS mechanical-electronic color system (October).

1951 Televised sessions of hearings on crime by Senate committee catapult Tennessee's Senator Kefauver into prominence (January). • ABC and United Paramount Theaters merge, with UPT's Leonard Goldenson becoming top man at network (April). • First coast-to-coast live television broadcast features President Truman's address to Japanese peace treaty conference in San Francisco, uses AT&T microwave facilities costing \$40,000,000 (September). • Manufacture of color television equipment is stopped for duration of Korean War (October).

1952 NBC begins the *Today* show (January). • FCC issues *Sixth Report and Order* on television allocation, ending Freeze and opening UHF band to television broadcasting (April). • First major amendments to Communications Act of 1934 become law; allow FCC to issue cease and desist orders as well as revoke licenses; require lower time charges for political ads (July). • First commercial UHF station takes to the air in Oregon (September). • Bing Crosby Enterprises demonstrates magnetic videotape recording machines to replace kinescopes (films) previously used for permanent television record (December).

The Age of Television (1952–1960)

1953 After two-year legal wrangle, required because station licenses were involved, FCC approves merger of UPT and ABC (January). • RCA and then NTSC ask FCC to adopt RCA compatible system of electronic color; and even CBS announces it will telecast with the system in the fall (June–July); FCC approves (December). • Armstrong demonstrates multiplexing system for FM—the basis of later storecasting and stereo operations (October). • FCC extends license period of television stations from one to three years, and limits ownership of stations for single owner to: five television (later extended to seven with addition of two UHF), seven AM, and seven FM stations (November).

1954 ABC and Disney studios sign a long-term contract, which generates the famous *Disneyland* and greatly strengthens ABC's competitive position (April). • Weeks of televised Army–McCarthy hearings mark the beginning of the downfall of Senator Joseph McCarthy.

1955 President Eisenhower opens news conference to first television newsfilm coverage, with films shown later after both White House approval and editing (January). • House and Senate Commerce committees issue reports critical of network monopolies, calling for major changes in regulation (February). • FCC authorizes Subsidiary Communications Authorizations (SCAs) for FM stations to trans-

mit music into stores and other business places, providing badly needed source of FM station income (March). • NBC announces *Monitor* weekend radio network program, which lasts into 1975. • Dumont television network switches over to film presentations with live coverage only for special events and sports. Network disappears altogether in September. • First major congressional investigation of television effects on juvenile delinquency ends, calling for FCC program censorship, stronger NAB code, and other changes (August). • Commercial television starts in England (September).

1956 Major film companies sell rights to “post-’48” films for television showing (January). • Ampex shows successful black-and-white videotape recorder (April).

1957 Major test of pay-TV begins in Bartlesville, Oklahoma (September). • FCC study of television network development and practices recommends more than 30 rules changes (October).

1958 FCC Commissioner Mack resigns for accepting bribes to vote for station applicant in the Miami channel 10 case (March). • FCC decides that regulation of cable television is beyond its authority because that service is not broadcasting (April). • United Press and International News Service merge to form UPI. (June). • Rumors of television quiz show rigging turn out to be true—programs are taken off the air, and investigation begins in New York (summer).

1959 In amending Section 315 of 1934 Act, exempting newscasts from equal opportunity for political candidate roles, Congress gives statutory backing to Fairness Doctrine. • Mutual network undergoes several changes of control to reduce financial pressures. • At congressional hearings, former quiz show contestants admit complicity in rigging process (October–November). To improve its image, industry forms Television Information Office, surveys audience reaction to the quiz and other scandals; networks promise more prime-time news programming.

1960 Attorney General Rogers says FCC and FTC have power to regulate payola and plugola

problems, as well as quiz show rigging (January). • FCC Chairman Doerfer resigns under fire for failing to maintain arms-length distance from broadcasters he is regulating (March). • Daytime serials and most other radio network entertainment programming ends, leaving news and special events coverage. • In first basic programming statement since 1946 "Blue Book," FCC outlines the responsibilities of licensees in public interest programming. • Congress suspends Section 315 for the 1960 election of national officials, paving way for four televised "Great Debates" between Nixon and Kennedy. Those debates, especially first one, probably change course of election. • Program of airborne television transmission for educational use in the Midwest (MPATI) begins after 15 years of plans and experiments (December).

Accommodation and Adjustment (1961–1977)

1961 Minow is named FCC chairman by President Kennedy (January). He sets tone for commission by depicting television as a "vast wasteland" at NAB meeting (May). • First presidential news conference covered live by radio and television (January). • Edward R. Murrow leaves CBS to head USIA (January). • FCC approves standards for FM stereo broadcasting (April), and stations begin using new means of transmission (June). • First man-in-space television special coverage is for suborbital flight of Alan Shepard (May). • FCC ends a 16-year controversy by breaking down 13 of 25 Class I-A (clear channel) frequencies to allow more local AM stations (September).

1962 John Henry Faulk wins libel judgment of \$3.5 million blacklisting case, helping to end blacklisting era (June). • Government begins financial grants to help support construction and facilities of educational television stations. • Telstar, first means of relaying television signals by space satellite, is launched into orbit for AT&T by NASA (July). • Comsat, the Communications Satellite Corporation, is formed after long congressional hearings (Sep-

tember). • Legislation is passed calling for all new television sets by early 1964 to have UHF reception capability (September).

1963 CBS and NBC begin half-hour evening newscasts, up from 15-minute length (September). • Television covers four days of tragedy following assassination of President Kennedy (November).

1964 Release of Surgeon General's report on dangers of smoking increases pressures for cigarette advertising limitation (January). • Supreme Court, in *New York Times v. Sullivan* case, makes conviction for libel unlikely in reporting of public officials' duties and character (March). • Networks and wire services set up election reporting service to pool results in upcoming fall election (June). Previous election campaign had brought complaints over television ads. • Subscription Television begins to provide pay-TV to homes in California cities (July), but referendum—later held to have been unconstitutional—rejects STV, and forces system to close down (November).

1965 First commercial synchronous communications satellite, Early Bird, goes into orbit and allows constant Europe-to-United States television (April).

1966 FCC takes over regulation of cable systems, calling for carriage of all local signals, same-day nonduplication, limited distant signal importation (February). • Television coverage of Vietnam War expands as fighting increases and United States becomes increasingly embroiled. • Court of Appeals for the District of Columbia says in WLBT case that audiences of stations have a right to be heard in FCC legal proceedings (March). • ABC applies to FCC for permission to merge with ITT (April), FCC twice approves on split votes, but Justice Department pressure kills merger at end of 1967. • Overmyer Network is announced as a fourth commercial chain of television stations, claiming 85 stations to take a two-hour nightly feed from Las Vegas (October).

1967 Thanks to Ford Foundation grant, NET offers first coast-to-coast network interconnected educational telecasts (January). That

same month, Carnegie Commission report offers many recommendations, helping to start era of *public* television and radio. • Overmyer (now named United) Network goes on the air (May) but soon stops operations due to lack of funds (June). • FCC, in first commercial application of Fairness Doctrine, announces that anti-smoking spots are needed to balance cigarette ads (June). • ABC announces (August) and gets FCC approval for (September) plan for four radio networks operating on a single telephone interconnection line, each network to cater to a different type of radio program format. • Corporation for Public Broadcasting is created by Public Broadcasting Act of 1967, based on Carnegie Commission recommendations (November).

1968 ABC splits radio operation into four separate networks (January). • Heavy coverage of aftermath of Martin Luther King, Jr., assassination shows major riots in some cities, helps to prevent others (April). Two months later television covers shooting and funeral of Senator Robert Kennedy (June). • Supreme Court, in *Southwestern Cable Co.* case, upholds FCC regulatory authority over all cable television systems (June). • Television networks receive many complaints over coverage of violence in Chicago streets during Democratic convention (August). • President's Commission on Telecommunication policy issues report, sees cable supplementing broadcasting services (December).

1969 FCC resolves long-controversial status of channel 5 in Boston by lifting license from *Herald-Traveler* newspaper and awarding it to local group with no other media holdings (January). • Senator Pastore requests Surgeon General to investigate effects of television violence on viewers, especially children (March). • Public Broadcasting Service is formed to operate public television station interconnection (April). • In *Red Lion* decision, Supreme Court upholds FCC's Fairness Doctrine noting that needs and rights of viewers to diversity of views are more important than rights of broadcasters (June). • Apollo 11 mission puts man on the moon, and television takes the story around the world, with live tele-

vision from surface of moon (July). • FCC requires program origination by cable systems with more than 3,500 subscribers, but rule not effectively enforced (October). • *Sesame Street*, product of Children's Television Workshop, begins daily telecasts on public television stations and quickly wins critical and children's acclaim. • In speech at Des Moines, Iowa, Vice President Agnew attacks television news and its perceived bias. This marks beginning of Nixon administration's antimedia campaign (November).

1970 FCC adopts rule to disallow AM-FM-TV or radio-television station ownership combinations in the same market in the future, while grandfathering (allowing to stand) existing combinations (March). • FCC limits network prime-time television programming to three hours a night—the Prime Time Access Rule, or PTAR—and effectively eliminates network control of syndicated programming (May). • Television UHF channels 69–83 reallocated to nonbroadcast uses (May). • President Nixon names Clay Whitehead as first director of his new Office of Telecommunications Policy (June).

1971 Ban on radio-television advertising of cigarettes begins after Congress passes restrictive legislation (January). • *Selling of the Pentagon* documentary on CBS creates wrangle between Congress and networks, and near contempt citation for CBS' Stanton, over television documentary and general news methods (January). • FCC releases rules for license applicants to follow, defining community ascertainment process (March)—seen by some as expanding "public access" movement in broadcasting, now five years old.

1972 Surgeon General's committee report on children and television viewing suggests there may be a causal relationship between video violence and some children's subsequent actions (January). • FCC issues definitive rules for cable television, allowing but restricting scope of cable in top 100 markets (February). • Justice Department files antitrust suit against three television networks, charging excessive control of programming and advertising (April). • Administration-sponsored reorganization

of public broadcasting begins, stressing local stations rather than national service—partly as a result of President Nixon's dislike of independent public affairs programming on PBS.

1973 FCC begins "re-regulation," or lessening of some administrative requirements, mainly for local radio stations. • Supreme Court rules, in BEM and DNC cases, that broadcasters are not required to sell time for editorial advertisements—a setback for advocates of greater media access (May). • Senate (Ervin) Watergate Committee hearings are carried on television for several weeks and help focus national attention on the scandal (spring and summer).

1974 Westar, first U.S. domestic communications satellite, is launched. • Television covers impeachment hearings against Nixon in first video coverage of House (July). Television covers the last days of Nixon administration, including first presidential resignation speech (August).

1975 FCC adopts rule restricting future newspaper ownership of local market radio stations (January). • Expansion of Citizens Band radio begins to create administrative headache for FCC and interference in other services, including broadcasting. • Electronic newsgathering—ENG, or use of videotape and live portable television cameras rather than film—expands rapidly among local stations. • Beginning of substantial pay-cable television operations, including Home Box Office (HBO). • NBC radio network drops *Monitor* and other programs and begins first national fulltime radio news service (June). • FCC interprets Section 315 to add more exemptions (September). • RCA Chairman Robert Sarnoff, son of David Sarnoff, is forced to resign by board of directors because of RCA's financial performance (November).

1976 After nearly two decades of discussion, Congress passes a new copyright bill to replace the 1909 act. Among many other things, it requires cable operators carrying signals to pay fees to broadcasters (October). • For the first time since 1960, presidential candidates "debate" one another (October). • In a sudden move, CBS fires Arthur Taylor as president, naming John Backe as successor and likely

eventual replacement for network founder William Paley, who announces his own plans to step down early in 1977 (October). • Federal judge in Los Angeles finds "Family Viewing Time" standard of networks and the National Association of Broadcasters TV Code to be illegal, partially because of findings of undue FCC pressure on the industry to adopt this self-regulation move. Decision places effect and impact of entire NAB radio and television code structure in doubt (November). • House Communications Subcommittee announces plans for total revision of the Communications Act of 1934 (December).

1977 Alex Haley's novel *Roots* is serialized as a mini-series over ABC for 12 hours over eight days, achieving unprecedented audiences—up to 80 million people—and deep emotional impact, particularly among blacks (January). • NBC ends two-year experiment with an all-news network service—too few stations affiliated to make the venture pay (May). • A new Carnegie Commission is announced to review problems of public television's finances and organization after a decade of system development since the first Carnegie report (June). • OTP is disbanded with most functions going to Department of Commerce (October).

Glossary



Glossary

This glossary has an essay form in preference to the typical circular set of definitions. Most terms deal with technology, although some deal with business and economics or broadcast programming. The technical basis for broadcasting is a subject for a book in itself, but it is also important as a factor in the development of electrical-electronic communication, together with politics, economics, the arts, and the social structure. Indeed, technology is less flexible than but fully intertwined with these other factors. Sometimes we can find a way around apparent technical or physical barriers—for example, by sacrificing quantity for speed, or by accepting less-than-perfect reproductions—but we can never ignore them.

Most words not found in this glossary can be readily found in a dictionary or are explained in context in the text. When a term has more than one meaning, the one most pertinent to broadcasting is used. We have tried to limit the brief explanations that follow to specialized terms and their interrelationships. Internal cross-references are supplied except

where they would be unduly duplicative or easily found as, for example, within the entries for *Broadcasting* and *Broadcast Media*. Terms that are mentioned in an entry but which are discussed in fuller scope elsewhere in this glossary are printed in **boldface**, but internal cross-references (*see* Such-and-so) are listed as shown here. The most efficient way to absorb this technical terminology rapidly may be to read the entire glossary as if it were a textbook.

ABC (American Broadcasting Company) *See* Network.

Actors Equity *See* Unions.

Aerial *See* Antenna.

af (audio frequency) *See* Receiver.

Affiliation, Affiliates *See* Network and Ownership.

AFM (American Federation of Musicians) *See* Unions.

AFTRA (American Federation of Television and Radio Artists) *See* Unions.

AGVA (American Guild of Variety Artists) *See* Unions.

Allocation, Assignment, Licensing Because all radio transmitters can cause *interference* in the form of man-made *static* or degradation of signal over a greater distance than they can give service, and since different frequencies (*see* Waves) have different characteristics, the FCC must apportion certain bands of frequencies or channels to a given service, such as television broadcasting or ship-to-shore or amateur radio—*allocation*; reserve or apportion some of these channels to a particular user or geographical area or city—*assignment*; and finally authorize a given user to that channel in that area—*licensing*. Because federal government agencies use about half the radio spectrum, allocation, which is circumscribed worldwide by international agreements and treaties, and assignment for these stations is done by the *Interdepartment Radio Advisory Committee (IRAC)*. The FCC standards for granting a broadcast station license involve citizenship, character, financing, and technical competence or facilities. Before a license is issued, a *construction permit (CP)* gives the potential licensee authority to build the station. Licenses are granted for distinct periods—normally three years in broadcasting—and may be revoked for cause. Sometimes, when the FCC has many applications for the same channel, it holds *comparative hearings*. When unexpected demand or unexpected technical difficulties arise with a given service or allocation to it, the FCC institutes a *freeze* on new licenses until the problem is resolved. In choosing between competing applicants—particularly between different services applying for the same band of frequencies, as in the recurrent conflict between television broadcasting and land mobile for the UHF television band—the FCC must make its decision in light of the touchstone criterion set forth in the Communications Act: the *public interest, convenience and/or necessity*.

Alternating Currents (AC) *See* Vacuum Tube.

Alternators *See* Transmitter.

Amateur (also known as a *ham*) An individual interested in radio technique solely with a personal aim and without pecuniary interest, char-

acterized by self-training and technical investigations. To become an amateur operator, a person must pass tests of technical knowledge and ability to communicate in **Morse code**, as contrasted to the simpler requirements for **Citizens Band (CB)** operators. In exchange, amateurs may, depending upon their class of skill, use much higher power than CBers may, a variety of frequencies, some permitting very long-range communication, and techniques forbidden to CBers. Many amateurs build or modify their own equipment. Amateurs frequently provide outstanding public service in times of disaster; their spectacular breakthroughs in technological and operational development contributed particularly to early broadcasting; and the military and naval forces, especially during World War I, eagerly recruited their services as trained radio operators. The frequencies allocated to amateurs throughout the spectrum permit them to communicate with other amateurs around the world. Amateurs communicate “person-to-person”—although they may start a conversation by calling “CQ,” a general call to anyone who may be listening. They do *not* “broadcast” intentionally to the general public, but anyone with the proper receiving equipment may listen.

Amperes *See* Circuit.

Amplification *See* Receiver and Vacuum Tube.

Amplitude Modulation (AM) *See* Modulation.

Antenna, Aerial A metallic device used for the sending and receiving of electromagnetic waves; often in the form of a tower or series of towers but frequently a horizontal length of wire, and sometimes a short vertical *whip*. Most broadcasting stations use vertical antennas; shipboard stations string antennas between the vessel’s masts. For efficiency, an antenna must bear a relationship to the wavelength (*see* Waves) of the frequency for which it is designed, usually one-half or one-quarter wavelength. If it does not bear such a relationship, the antenna will not *resonate* properly to the transmitted or received wave. Hence, since wavelength increases as frequency diminishes, we find that standard (AM) broadcast stations use their entire tower as an antenna, whereas FM broadcast stations, on a much higher frequency, have

only a small antenna on top of the tower. The international radiotelegraph distress frequency, 500 kHz, is very short to use as a wavelength for long-range use over water, but it was chosen many years ago because antennas for that frequency could fit physically between the masts of the typical oceangoing ship. A VHF television or FM receiving antenna is roughly five feet wide whereas a UHF television antenna—of higher frequency and thus shorter wavelength—is less than two feet wide. At even higher frequencies, precisely aimed *dishes* (*parabolic reflectors*) from two to 100 feet in diameter are used to focus the extremely short waves precisely onto the antenna element located at their focal point. It is also possible to “aim” huge antenna arrays on the shortwave (high frequency) band and even to construct a directional system with towers to reinforce and cancel one another so that a standard broadcast (AM) station causes minimal interference in one or more directions. *Directional antenna* (*DA*) installations are particularly useful today, since the FCC has put a large number of stations on almost every **channel**. Transmitting antennas can be oriented to supply *horizontal*, *vertical*, or *circular polarization*, the first two of which require similarly oriented receiving antennas for efficient reception. These techniques generally permit a reduction in interference so that stations on the same frequency can be located closer together.

AP (Associated Press) *See* News.

ASCAP (American Society of Composers, Authors and Publishers) *See* Copyright.

Aspect Ratio *See* Television Signals.

Assignment *See* Allocation.

Audience *See* Communication.

Audio Of or pertaining to audible sound, or its broadcasting, or recording and reproduction.

Audion *See* Vacuum Tube.

Automation The totality of mechanical and electronic techniques and equipment used to achieve control of a process, equipment, or system. Many automated radio stations use automatic playing of music tapes and recorded commercials to cut down on use of engineers

and other personnel. In its favor, automation cuts down the boring, repetitious, and complex tasks that often lead to on-air errors, particularly at station-break time (“panic periods”). More and more broadcast equipment, including transmitters, is operated by unattended automation.

Bandwidth The bandwidth, the amount of electromagnetic *spectrum* space efficiently occupied by a **channel**, depends upon the amount of information that one wants to transmit. For example, a dot in Morse code takes an appreciable fraction of a second to form, but requires only one “bit” of information: the telegraph key is momentarily depressed, and a brief spurt of electricity is sent down the line or to the transmitter. In a radiotelegraph system, such a signal requires only about 50 Hz of bandwidth. (A *Hertz*, or Hz, is equivalent to one cycle per second of alternating current; a kiloHertz [kHz] to one thousand cycles per second, a megaHertz [MHz] to one million cycles per second. The terms kilocycle [kc] or megacycle [mc] were used until the 1960s, when it was internationally agreed to honor Heinrich Hertz, one of the earliest wireless experimenters.) Voice requires more: although your hi-fi system may state on its nameplate that it handles audio frequencies from “20 to 20,000 Hz,” the human voice rarely requires more than 5,000 Hz (or 5 kiloHertz or 5 kHz) of bandwidth. In fact, the typical telephone system transmits only some 2,500 Hz, accounting for the tinny sound of a telephone conversation, which has lost its highest and lowest voice frequencies. This is all that is needed for maximum intelligibility, although radio stations using telephone lines for networking or picking up programs from remote locations have special equipment at both ends to extend the response of the telephone system to 5 kHz or, in the case of high-fidelity FM, as much as 15 kHz. A single picture on a television set, requiring only a tiny fraction of a second to form, contains a great deal of information—but requires 4.5 MHz (*see* Television Signals.)

If the necessary bandwidth is not available, it is possible to transmit the information by sampling—the human eye and ear

can “remember” through such processes as persistence of vision, which makes it possible to perceive motion in a series of still pictures on a film—or by presenting the information in sequential rather than simultaneous form, as in television *scanning*. For example, some early experimenters with the telegraph used a separate wire circuit for each of the 26 letters of the alphabet, a logical although inefficient and expensive configuration. One of Morse’s and his associates’ contributions was the use of a code for sending the letters of the message one after the other as electrical pulses through one wire. (See also **Television’s Early Technological Development**.)

Base See Land Mobile.

Binaural See Modulation.

Blanking Interval See Television Signals.

BMI (Broadcast Music, Inc.) See Copyright.

Boosters See Satellite.

Broadcasting A radiocommunication service of transmissions intended to be received directly by the general public. This service may include transmissions of sounds—**radio broadcasting**—or transmissions by **television, facsimile**, or other means. Broadcasting—to everyone—should be distinguished from two-way or point-to-point communication, which was called *narrowcasting* in the early 1920s. (See Mass Communication.)

Broadcast Journalism See News.

Broadcast Media In the United States, standard broadcast (AM) stations; frequency modulation (FM) stations, both commercial and noncommercial educational; television stations, both commercial and noncommercial educational; international (shortwave) stations; and experimental facsimile and other classes of service.

Cable (also *CATV* or *Community Antenna Television*) Although the word “cable” was used after the mid-1850s to refer to underwater and telegraph lines, particularly between continents, and still has that connotation, since the 1950s it has been used as a shortened form of

“cable television,” a system for distributing television (and sometimes radio) to homes in an area by means of wire rather than radiocommunication. Although systems from the late 1940s into the 1960s typically provided very few channels and were sometimes a cooperative or nonprofit public service, modern systems can provide 12 to 26 or more channels and operate as profit-making businesses. In addition to providing interference-free reception of local stations, modern systems bring in signals from distant cities and sometimes provide *local origination*, governmental, educational, and *public access* channels, and *pay-cable* service (see *Pay-TV*). The “*wired city*” is a proposal that telecommunication services in the United States, including television and access to computers, will and should eventually be distributed by a *wide-band* (great information-carrying capacity) cable directly to individual homes.

A CATV system typically consists of a *head end*—the location where signals from local stations or microwave (see *Waves*) signals from distant ones are picked up and amplified for retransmission through the system—several miles of *trunk lines* either on poles or underground, and individual *service drops* or wired connections to individual subscribers, together with the various amplifiers and other devices that are needed to push the signal through the system. A *two-way cable system* permits some signal transmission from the subscriber’s home back to the head end—for remote reading of utility meters, information as to whether a *pay-cable* or *pay-TV* signal is being used, and so forth. In the 1970s some experimentation and planning has been going on for *interactive cable systems* allowing a complete two-way voice and picture communication process. Most CATV systems charge subscribers a monthly fee. A recent trend is toward multiple system operators (*MSO*), who own or operate cable systems in several communities. Most regulation of cable is through municipal *franchising*, although some states and the federal government (FCC) have been promulgating some regulations and standards. In Europe, CATV would be called *rediffusion*, a term applied to wired radio (particularly in the United Kingdom and the Soviet Union) as well as wired television. A *master an-*

tenna system (MATV) typically serves only a single institution or apartment house and rarely offers the auxiliary services mentioned above.

Call Letters Combinations of letters and sometimes numbers used to identify radio stations over the air. Blocks of initial letters are assigned to a particular country, a practice started as a result of the London, International Radiotelegraph Conference of 1912. The United States has been assigned all of the blocks with the initial letters W, K and N, and much of A, although both A and N calls are reserved for military and naval use. Several N (for Navy) stations were used for early radio experimentation. In broadcasting, W is generally used east of the Mississippi and K west, with a few exceptions—usually older stations such as KYW, Philadelphia, and KDKA, Pittsburgh. An X following a number generally means an experimental station (9XM, 8XK, W2XR) with numbers in these early calls, and in amateur licenses, representing geographical districts. Although some pioneer stations still have three-letter call signs, most are four-letter, with many FM and television stations using those suffixes to create five- and six-letter calls (WNYC-TV). Stations may select their own call signs, within FCC guidelines and rules, leading to ingenious acronyms (WIOD, Miami = Wonderful Isle of Dreams; WGN, Chicago = World's Greatest Newspaper, the original licensee of the *Chicago Tribune*) or associative meanings (KOP = Detroit Police Department; WILK = Wilkes-Barre, Pennsylvania.)

Carrier Wave See Modulation and Transmitter.

Cartridge See Recordings.

Cassette See Recordings.

Cathode See Vacuum Tube.

CATV (Community Antenna Television) See Cable.

CBS (Columbia Broadcasting System) See Network.

Chain Broadcasting See Network.

Channel A channel is an arbitrarily defined group of radio frequencies occupying a segment of the spectrum wide enough to permit operation of a station of a given service. For

example, a channel for a standard (AM) broadcasting station is 10 kHz wide, but one for a television broadcasting station is 600 times wider (6 MHz) in order to handle the additional information of a picture. On the standard (AM) broadcast band, 107 channels are divided into three categories with five classes of stations operating on them. A *clear channel* is one on which only one *dominant station* operates at night for several thousand miles, although a number of low to medium power *secondary stations* may share it with the dominant station during the day. The United States, Canada, Mexico, and other North American countries are signatories to the North American Regional Broadcasting Agreement (NARBA), negotiated in 1937 and revised in 1950. Each country has channels on which one of its stations is dominant. The treaty also provides that each dominant station use at least 50,000 watts of power; in the United States, 50 kw is also the upper limit, because of a "Sense of the Senate" resolution in the late 1930s. (See also *Waves and Bandwidth*).

The following are the ways in which standard broadcast (AM) channels are presently classified in the United States:

- 60 **Clear channels**—one dominant station in most instances.
 - 24 **Class IA**—one U.S. dominant station on each, with only 1–7 other, lower power stations sharing the channel by day and none by night.
 - 17 —dominant station in Canada, Mexico, Cuba, etc., may be used by some U.S. lower power stations by day.
 - 19 **Class IB**—two or, in some cases, more stations sharing each channel at night, with from 1 to 40 or more Class II U.S. stations and others in other countries sharing the channel during the day.
- 41 **Regional channels (Class III)**—each generally used by from 20 to 70 or more stations spaced several hundred miles apart, using 5 to 50 kw of power.
- 6 **Local channels (Class IV)**—each generally used by 150 to 175 stations using low power (250 watts at night, 1 kw during the day), often spaced only a few tens of miles apart so that their tower lights sometimes can be seen farther than the signal reaches.
- 107 **Channels from 540 through 1,600 kHz.** Since each channel is 10 kHz wide, the total standard broadcast band is from 535 through 1,605 kHz.

Circuit A pathway which ends at the same place it began. In *electrical circuits*, electricity flows from the source, through a switch or other control device and a *load*, and back to the source. The source may be a *generator*, a rotating machine that produces electricity when spinning; a *battery*, a chemical source of electricity; or, as in the case of radio, a **transmitter**. The load may be a lamp, a motor, a heater, or something similar that does a certain amount of work—produces light, motion, heat, and so on. If there is no load, there is also no *resistance*—an electrical property measured in ohms related to the amount of energy (*watts*) the load requires to do work; and, if a conducting path, a wire, connects one side of the source to the other without a load, we have a *short-circuit*—a condition demanding an infinite amount of electricity, which quickly results in a burned-out wire or generator—or fuse, if such a protection was inserted in the circuit. There are two basic electrical circuits: *series*, which is like a chain, through each link of which all the *current* flows; and *parallel*, which requires both sides of the source to be linked to each load, as, for example, all outlets in a house must have two wires connected to them. With a parallel circuit, one part of the load may be disconnected without having any effect on the others; with a series circuit, the removal of any part of the circuit “breaks the chain.” Current is measured in *amperes*, calculated by dividing the *voltage* in the circuit (the amount of “pressure,” measured in *volts*) by the resistance.

In a simple electrical telegraph circuit, the elements consist of batteries (the source), a key (a switch which can be manipulated on and off very rapidly), the wire connecting the sending and receiving stations, a relay at the receiving **station**, and a *return wire* to the other terminal of the battery. (Actually, since the *ground* will conduct electricity, in most cases the earth itself is used for the return part of the circuit, with both the return wire from the relay at the receiving station and one terminal from the battery at the sending station connected to it.) The *relay*, or *sounder* in early telegraph language, consists of a fine coil of wire wound around a piece of soft iron, the thinness of the wire providing some resistance in the circuit.

Electricity passing through the coil converts the iron core into an *electromagnet*, which is set up to attract or repulse another piece of iron or steel that hits it with an audible “click” and then is pulled away by a spring as soon as the current is off. These clicks form the dots and dashes of **Morse code**.

A radio circuit is comparable: the source of electricity is a **transmitter**, which is “keyed” or “modulated” much as the electrical telegraph circuit is keyed manually. However, instead of needing a wire conductor to connect sending and receiving stations, radio **waves** can be sent through the atmosphere from an antenna connected to the transmitter and through the ground for a return. A circuit, in radio terms, generally if a little loosely applies to a two-way pathway using a particular frequency or **channel**. It may also refer to the arrangements of components within a transmitter, receiver, or other electronic device—the design of the unit, in electronic terms. This latter usage is derived from the fact that *electrons*, tiny units of energy, must travel in a circuit from source back to source to do any work.

Citizens Band (CB) A two-way radio service that any member of the public, not just truckers, may use. Simple to operate, CB consists of low-power fixed and mobile stations intended for personal or business communication, radio signaling, control of remote devices, and almost anything else not prohibited. It differs from broadcasting in that it is a short-range point-to-point service, and it differs from amateur radio in that amateurs have technical skills and use radio more as a hobby than for personal or business communication. CBers may not engage in technical experimentation. Some channels have been formally or informally assigned to special uses: channel 9 for emergencies, channel 19 for truckers. Citizens Band radio was established by the FCC in 1958 but grew slowly until the mid-1970s, when suddenly millions of units were sold, perhaps sparked by the desire of motorists to avoid traffic police (“smokey”) enforcing speed limits during a gasoline shortage, and the service assumed the status of a fad complete with its own songs and movies and references on comedy television shows. In 1977 the number of CB

channels was increased from 23 to 40 because of demand for more space. (*See also Amateur.*)

Clear Channel *See* Channel.

Closed-circuit Not broadcast; availability intentionally restricted as to location due to use of wired circuits or radio frequency band used.

Coaxial Cable A cable consisting of two concentric metallic conductors—a thin wire or pipe in the middle and, separated by a carefully and evenly sized insulator, and outer conductor of woven metal mesh or a larger pipe. Most coaxial cable is flexible with an outer plastic sheath for insulation and mechanical protection; the kind that has rigid piping generally is restricted to short runs carrying high current, such as from a powerful transmitter to an antenna. Coaxial cable can carry a tremendous **bandwidth** and has made long-distance—beyond the range of off-the-air pickup—television transmission or program distribution practical. Much of the intercity television (and telephone) network (and, indeed, most video signals carried by wire within a studio or in a **cable system**) requires coaxial cables, since ordinary wires do not carry a television signal satisfactorily. The rest of the intercity network uses wideband *microwave* (*see* Waves) point-to-point transmission and reception systems. Although modern practice has produced cables utilizing several coaxial conductors independently covered by the same outer sheath, permitting very wide bandwidths to be carried, it is likely that the new *fiber optic*, an extremely fine thread of fiberglass, will be increasingly used in their stead.

Coherent *See* Laser.

Coherer *See* Receiver.

Coincidental *See* Ratings.

Color, Colorburst, Color Wheel *See* Television Signals.

Common Carrier A transportation or communication activity—bus lines, telegraph and telephone companies—which undertakes to accept for transmission at published nondiscriminatory rates all correspondence—freight, passengers, messages—tendered by members of the public. A common carrier is often a *public utility*, an organization operating under a fran-

chise from a government and charged with certain activities necessary for the public welfare, that accepts regulation of rates in exchange for monopoly or near-monopoly status. By law, broadcasting is not considered a common carrier and is not regulated as such for rates or program content.

Communication The transmission and reception of information through any medium between and among humans and/or machines and/or animals (*see also* Mass Communication, Mass Media). *Information*, according to the theory developed by Shannon, Weaver, and others, is anything (particularly, but not exclusively, knowledge and intelligence) which someone desires to have transmitted, together with any intelligence transmitted—intentionally or not. *Intelligence* is an old word for “news”; information of military value. Also, information understandable to or capable of being deduced by the recipient or *audience*: the eventual recipient(s) of a message. A *message* is intentionally coded (into speech or some other form) and transmitted as information. Most messages have *meaning*, which means that there is a sharing of concepts between a communicator and the audience. A *symbol* or *sign* or code has meaning to the extent that its connotations and denotations are mutually understood by communicator and audience. (*See also* **Signal**.)

Community Antenna Television *See* Cable.

Comparative Hearings *See* Allocation.

Conduction *See* Radiation.

Conductivity *See* Waves.

Conglomerate *See* Ownership.

Construction Permit (CP) *See* Allocation.

Continuous Wave (CW) *See* Modulation.

Copyright, Performing Rights Societies Literally, the power to control the right to copy a literary work—articles, plays—music, paintings. The copyright system was established in Article I, Section 8, of the U.S. Constitution (*see* Invention, Innovation, Patents). Although one copyrights a piece by labeling it, prior to publication or distribution, with a © or the word “copyright,” the name of the copyright owner, and the year, it is wise to *register* the copyright

with the U.S. Register of Copyrights in order to have dated proof of notice of copyright. *Infringement* of copyright—copying without permission—is a federal offense. A 1976 copyright law (effective January 1, 1978) puts obligations on CATV for the first time, and gives the right for the author's life plus 50 years. *Performing rights societies* such as ASCAP (American Society of Composers, Authors and Publishers) and BMI (Broadcast Music, Incorporated) administer the copyrights held on most music for the benefit of the copyright holder(s); some European music is controlled by SESAC, Incorporated. Started in 1914 when composer Victor Herbert objected to the playing of his music in a restaurant, benefiting the restaurant but not Herbert, ASCAP licenses performance of all music owned by persons for whom it acts as agent. (Recording, dramatic, and other rights are licensed case by case.) Each station pays a percentage of its gross revenues for the right to play all ASCAP music. Each year, ASCAP distributes these monies to its members according to a complex formula and following a sample survey of actual renditions of each piece of music. In 1939–1940, ASCAP raised its rates to the point where broadcasters rebelled and organized a rival organization, BMI. Today, most stations have contracts with both organizations—although the relationship is never placid and is presently complicated by court supervision of the business.

Cross-media Ownership *See* Ownership.

Crystal Control *See* Transmitter.

Crystal Set *See* Receiver and Vacuum Tube.

Current *See* Circuit.

Decoherer *See* Receiver.

Detection *See* Vacuum Tube.

Diaries *See* Ratings.

Diode *See* Vacuum Tube.

Diplexing *See* Modulation.

Direct Current (DC) *See* Vacuum Tube.

Direct Wave *See* Waves.

Directional Antenna (DA) *See* Antenna.

Discrete *See* Laser and Modulation.

Dominant Station *See* Channel.

Dot Sequential *See* Television Signals.

Duopoly *See* Ownership.

DX-ing A hobby, quite popular in the first decades of radio, of attempting to receive stations far beyond normal reception range. Most stations in a given city cooperated by going off the air one night a week, the “*silent night*,” so that listeners could pick up stations elsewhere in the country. Silent nights had stopped by the late 1920s as more stations went on the air, competition increased, and broadcasting became more familiar, but DX-ing continues today among amateur and some broadcasting listeners, particularly FM and television near the height of the 11-year sunspot cycle when freak reception is more common.

Edison Effect *See* Vacuum Tube.

Editorials *See* News.

Educational Television *See* ETV.

Electrical Circuit *See* Circuit.

Electrical Transcription *See* Recordings.

Electromagnet *See* Circuit.

Electromagnetic Energy A class of phenomena such as radio waves, heat (infrared) waves, light waves, X-rays, gamma rays, and cosmic rays. These waves are propagated at the speed of light—approximately 186,300 miles per second, or 300,000,000 meters per second—and differ chiefly in the degree to which waves of various frequencies or lengths are reflected from or pass through different physical media. The electromagnetic spectrum is comprised of all types of waves, from electrical and radio waves alternating a few times per second through light waves with frequencies measured in billions of Hertz (cycles per second), and even beyond. (*See* Waves.)

Electrons *See* Circuit.

ENG (Electronic News Gathering) The use of portable, battery-operated electronic equipment—microphones, television cameras, videotape recorders—for acquiring television news, in contrast to the use of studios or portable film cameras for this purpose. In the process, tapes are taken back to the station or the tape or a

live picture is sent to the station, by means of a mobile or portable transmitter, as a **remote**. ENG became dominant in many markets in the 1970s after development of portable color equipment (including *time base correctors* permitting the use of less expensive videotape recorders over-the-air), in spite of its high initial cost, partly because it permitted immediate replay of pictorial material without delays for film processing.

ETV, ITV, PTV (*educational, instructional, and public television*) Originally *educational* broadcasting was the generic term for classroom instructional, adult education, and cultural programming, particularly when aired over noncommercial educational stations. *Public* broadcasting, popularized by a 1967 Carnegie Commission report, generally refers to broadcasting on noncommercial stations. *Instructional* television generally has been restricted to in-class or other *closed-circuit* or videotaped uses. The same descriptive words can be applied, with suitable modification, to radio.

Facsimile A system of **telecommunication** for the transmission of fixed images (*television* transmits moving or transient images) with a view to their reception in a permanent (paper) or semipermanent form. Includes the *wirephoto* process used by wire services to send pictures to newspapers. Experiments with broadcast facsimile were conducted in the 1940s, and industrial interest in the technique was being exploited into the 1970s. Systems using blank lines in a television picture to transmit "pages" of information to the home video screen, such as Britain's CEEFAX, are not truly facsimile. (*See also Television's Early Technical Development.*)

Family Viewing *See* Programming.

Feedback Feedback is any situation whereby a portion of the output of any process or system influences the input into the system in the future. *Negative feedback* is used to control or "dampen" the process; *positive feedback* reinforces the ongoing process and is usually detrimental. In **mass communication**, any means of responding to a particular message (letters to the editor, sales, audience ratings) is an example of feedback.

Fiber Optic *See* Coaxial Cable.

Fields *See* Television Signals.

Field Sequential *See* Television Signals.

Filament *See* Vacuum Tube.

Film Chain *See* Television Camera Tubes.

Fixed *See* Land Mobile.

Fleming Valve *See* Vacuum Tube.

Frames *See* Television Signals.

Franchising *See* Cable.

Freeze *See* Allocation.

Frequency *See* Waves.

Frequency Modulation (FM) *See* Modulation.

Galvanometer *See* Receiver.

Generations *See* Recordings.

Generator *See* Circuit.

Grid *See* Vacuum Tube.

Ground *See* Circuit.

Groundwave *See* Waves.

Guard Bands *See* Television Signals.

Guns *See* Television Signals.

Ham *See* Amateur.

Head End *See* Cable.

Helical Scan *See* Recordings.

Hertz (Hz) *See* Bandwidth.

Heterodyne *See* Receiver.

High Band *See* Recordings.

Holography *See* Laser.

IATSE (International Alliance of Theatrical Stage Employees) *See* Unions.

IBEW (International Brotherhood of Electrical Workers) *See* Unions.

Iconoscope *See* Television Camera Tubes.

Image Dissectors *See* Television Camera Tubes.

Image Orthicon *See* Television Camera Tubes.

Incoherent *See* Laser.

Induction *See* Radiation.

Information *See* Communication.

Information Theory See Morse Code.

Infringement See Copyright.

Innovation See Invention.

Instructional Television See ETV.

Integrated Solid State Circuits See Vacuum Tube.

Intelligence See Communication.

Interactive Cable Systems See Cable.

Interference See Allocation.

Interlaced See Television Signals.

Intermediate Frequency (IF) See Receiver.

Invention, Innovation, Patents *Invention* is the act or process of developing something new—a device, a process, a thing—through study and experimentation. *Innovation* is the introduction of an invention into use or into the marketplace. The U.S. Constitution (Article I, Section 8) empowers the federal government to issue *patents*, which guarantee to the inventor exclusive rights for 17 years to manufacture, or to *license* the manufacture of the invention in exchange for monetary *royalties*. In exchange, the invention goes into the public domain after that period, or it may be renewed once. The intent of a patent system is to encourage both invention and use of that invention widely, rather than keep it as a *trade secret* for an indefinite period. (See also **Copyright**.)

Ionosphere See Waves.

IRAC (Interdepartment Radio Advisory Committee) See Allocation.

Kinescope Recorder (Kine) See Recordings and Television Camera Tubes.

Land Mobile A family of radiocommunication services, generally the **safety and special services**—police, forestry—but sometimes the **common carrier services**—mobile telephone, and so forth. Mobile units in cars and airplanes may be associated with *fixed* or *base* stations that communicate with a number of mobile units. Since the late 1940s, the growth of land mobile has clashed with the growth or preservation of television broadcast frequency bands, since both services need vast amounts of spectrum space with similar characteristics.

Laser An acronym for *light amplification by stimulated emission of radiation*. Any one of a number of devices that can convert incident electromagnetic radiation of mixed frequency (*incoherent*) energy to one or more very specific or *discrete* frequencies of highly amplified and *coherent* visible radiation. Can be used for carrying great amounts of information or, because of the coherent nature of the radiation and its sharply aimed focus, for cutting materials; also for *holography*, a technique for recording and reproducing three-dimensional “pictures.”

License See Invention and Allocation.

Licensee See Ownership.

Licensing See Allocation.

Line-of-Sight See Waves.

Lines See Television Signals.

Local Oscillator See Receiver.

Local Origination See Cable.

Long Playing (LP) See Recordings.

Longwave See Waves.

Mass Communication Simultaneous (or nearly so) process—essentially one-way communication from a single source addressed to a mass audience. The message usually is reproduced in quantity through mechanical or electronic devices. A *mass audience* is more than two undifferentiated persons voluntarily engaged in the same communications behavior or activity, but not necessarily interacting in other ways. **Feedback**, often economic, may alter the content of mass communication but does not alter the one-way nature of a given mass communication event. (See **Communication**.)

Mass Media The means or channels of mass communication: primarily newspapers, magazines, radio (sound) broadcasting, television broadcasting, motion pictures, and, secondarily, the theater, recordings, and books. Heterogeneity of content within the medium, but not necessarily any specific item or example, and voluntary attention by the audience are common characteristics of the mass media.

Master See Recordings.

Master Antenna (MATV) See Cable.

Matrix See Modulation.

Meaning See Communication.

Mechanical Scanning See Television's Early Technological Development.

Message See Communication.

Microgroove See Recordings.

Microwave See Waves.

Modulated Continuous Wave (MCW) See Modulation.

Modulation A radio signal generally consists of a *carrier wave* and one or two *sidebands*. (Sophisticated systems such as *single sideband* do not strictly follow this pattern, but they are not used for broadcasting.) The carrier wave **signal** generally is on the center frequency of the **channel** on which the **transmitter** is operating and, unless used in an "off-on" manner to transmit **Morse code**, carries no intelligence itself. The *information* or intelligence or *message* is carried in the form of *modulated* sidebands. Sometimes the modulation is a variation in the strength or *amplitude* of the sideband, sometimes it is a swing of *frequency* within the channel, sometimes it has other forms, such as *pulses*. The first two (amplitude modulation or AM, and frequency modulation or FM) are used for broadcasting. AM takes up less spectrum space but is more prone to interference on most bands. Television uses FM for sound and AM for picture. Some radiotelegraph systems use the modulation of a tone, interrupted to produce dots and dashes, on a *continuous wave* (CW) or *modulated CW* transmitter. Within each channel there may be space to put additional information; a telegraph signal, using very little **bandwidth**, can generally be added to a telephone channel, with the telegraph sound being filtered out at the telephone. In addition, the bandwidth of a channel can often be divided and made more useful by *diplexing* or *multiplexing*—inserting two or more signals on the same channel in such a way that each may be retrieved independently at the receiving end. The FCC has allowed FM broadcast stations to obtain a *Subsidiary Communications Authorization* (SCA) that will permit it to use one or more *subcarriers* within the total channel bandwidth of 200 kHz but outside the modulated frequency swing of the main program channel.

These subcarriers generally are used for *stereophonic* (*stereo*) music transmissions. In a *binaural* system, the human condition of two ears feeding one brain is extended backwards from ears to two loudspeakers, two amplifiers, two signals from the receiver, and two microphones. Stereo permits listeners with proper equipment to hear the music stereophonically and other listeners to hear it *monaurally*. In recent years *quadrasonic* systems, which give the illusion of four sound sources surrounding the listener, have been developed, some using the *discrete* system—four separate isolated channels fed to four speakers—and others the *matrix* system—reduction and encoding of four channels into two, and decoding back into four at the receiver or player, a less expensive but slightly less efficient process. Other FM stations use their subcarriers for *storecasting* or *transitcasting* or for even more specialized services such as *facsimile* or special programming to the blind or, using teletypewriters, the deaf. (See Waves). *Transitcasting* is an SCA service supplied to trains, busses, and similar conveyances by FM stations. Since the driver or crew usually controls the receiver, the riding public becomes a captive audience to the broadcast station and its music, and sometimes commercial messages. After some public outcry and the decline in public transit use after the early 1960s, *storecasting* became rare. A similar service is *storecasting*, in which a music service—sometimes labeled *Muzak* after the franchised trademark used by the largest of such firms—is delivered over a subcarrier or over leased wire lines to stores, doctors' offices, and other business places. If broadcast, special receivers able to pick up the subcarrier are supplied for a monthly fee.

Monaurally See Modulation.

Morse Code Code that permits transmission of English alphabet as a series of short and long pulses of electricity or signal; "dots and dashes." Invented by Samuel F. B. Morse and his associates (especially Alfred Vail) in the 1830s for use with the electrical **telegraph**. Because it made use of the fact that some letters are more common in English than others, it was an unconscious use of some of the principles of *in-*

formation theory (see Communication) to achieve greater efficiency—the letter *e* for example is very common and is coded as one quickly and easily transmitted dot, whereas the infrequently used letter *z* requires two dashes and two dots.

Mosaic See Modulation.

Motion Pictures A visual record of a story or event, stored in the form of images, and usually the associated sound, on film, for later projection at such speed as to give an audience an illusion of motion; also, the projection of same. In a television studio, films generally are projected in a film chain (see Television Camera Tubes).

MSO (Multiple System Operator) See Cable.

Multiple Ownership See Ownership.

Multiplexed See Modulation and Television Camera Tubes.

Mutual Broadcasting System (MBS) See Network.

NAB (National Association of Broadcasters) Television Code See Programming.

NABET (National Association of Broadcast Employees and Technicians) See Unions.

NARBA (North American Regional Broadcasting Agreement) See Channel.

Narrowcasting See Broadcasting.

Network Two or more stations, often broadcasting stations, interconnected by some means, or associated for the often simultaneous transmission of the same messages or programs. When one station picks up the signal off-the-air from another, it is a *relay*. Broadcasting networks were referred to as *chain broadcasting* in the 1920s and 1930s, and colloquially are known as *webs* or *nets*. Presently in the United States there are four national television networks—American Broadcasting Company (ABC), Columbia Broadcasting System (CBS), National Broadcasting Company (NBC), and the Public Broadcasting Service (PBS)—and four major national radio networks—ABC, CBS, NBC, and Mutual Broadcasting System—as well as National Public Radio (NPR). Most television stations and just over half the country's radio sta-

tions are affiliated with networks. In the United States, a network generally consists of the program-producing and central administering organization, a small number of *owned-and-operated* (O & O) stations (see Ownership), and a greater number of independently owned but *affiliated* stations. The network generally produces, or buys from independent producers or *packagers*, programs that are beyond the resources of a single station and “sells” them to national advertisers for program production costs and the aggregate sum of the time charges of all affiliates airing the program. Stations may refuse to carry network programs, since the station licensee is legally responsible for everything aired over the station. The affiliates receive only 25 percent to 35 percent of their normal time charges but gain in other ways. They can sell *spots*—commercial advertisements—immediately before and after the program, during *station break* or *station ID* (identification) periods, for high prices because of advertiser desire to reach the large audiences attracted by the expensive network programs. The networks also supply affiliates with some *sustaining*—not *sponsored* by commercial advertisers—programs without cost, as well as with prestigious news programming. The network usually pays for interconnecting the stations by microwave or *coaxial cable* facilities supplied by AT&T, although in the future it may be leasing facilities on space communications *satellites*.

News The timely report of an event of interest to a number of people, often obtained through the *wire services*, or *news agencies*—organizations which gather news and transmit it, usually by *teletypewriter*, to media clients for dissemination to the public by various means. The main wire services used in the United States are the Associated Press (AP), United Press International (UPI), and Reuters, an English firm. Frequently considered part of *broadcast journalism* are *public affairs* programs, which consist of news and feature material dealing with government and public issues that help citizens make reasoned decisions on such matters, and *editorials*, which are clearly identified, on-the-air expressions of opinion by a station licensee or his representative on a topic of public interest and concern. (See ENG and Remote.)

Nipkow Disc See Television's Early Technological Development.

Noise See Signal.

NTSC (National Television Standards Committee) See Television Signals.

O & O (Owned and Operated) See Network.

Off-network See Programming.

Ohm See Circuit.

Orthicon See Television Camera Tubes.

Outside Broadcast (OB) See Remote.

Ownership Although physical facilities and goodwill may be owned, the Communications Act of 1934 (and the Radio Act of 1927 before it) reserves title to the entire electromagnetic spectrum in the hands of the people of the United States, with the government administering it. Hence, although someone may own a transmitter, the public owns the channel on which it is operating. The broadcaster merely has a permit to use it in the public interest for a few years; in practice, licenses are renewable and have rarely been revoked during or at the end of their term. The FCC has frequently investigated the possibility of concentration of control and has issued reports, orders, and rules frowning on *cross-media ownership*, overlapping ownership of newspaper and broadcasting stations in the same market; *duopoly*, prohibiting one licensee from controlling more than one station of the same service in a single market; and *multiple ownership*, currently limiting the number of stations an individual or company may own in the broadcasting services to seven standard (AM), seven FM, and seven television, provided that no more than five of the television stations are VHF. In addition, the commission no longer routinely approves AM-FM-TV combinations in the same market, although those already licensed to a single individual or company may continue until a change of ownership occurs. Many multiple or group owners have stations in different towns; in recent years *conglomerate* companies—firms that own or control numerous companies in different fields—have entered the field of broadcasting. **Network affiliation** is not the same as ownership; many group owners have one

station affiliated with one network, a second station with another network, and so on. The licensee, or station "owner," is responsible for everything broadcast over the station since, at least in theory, he or she is a trustee for the public.

Package, Packager See Network and Programming.

PAL (Phase Alternate Line) See Television Signals.

Parabolic Reflector See Antenna.

Parallel See Circuit.

Patents See Invention.

Pay-cable See Cable and Pay-TV.

Pay-TV A television distribution plan in which members of the audience pay a special charge for particular programs. Originally planned as an over-the-air service, and the subject of a number of demonstrations and experiments from 1951 on, most pay-TV is now in the form of *pay-cable*, a separate **cable television** channel for which an additional monthly charge is levied. Sometimes pay-TV charges are based on the individual program, using a variety of hardware to prevent nonpaying viewers from descrambling or obtaining the pay program(s). *Scrambling* is a process that mixes up picture or sound elements during transmission but permits normal reception on a set with the proper equipment attached. The Home Box Office organization recently established a system to provide pay-cable programs to the head end of cable systems using communications *satellites* or microwave.

Performing Rights Societies See Copyright.

Phosphor See Television Signals.

Picture Elements See Television Signals.

Plate See Vacuum Tube.

Plumbicon See Television Camera Tubes.

Polarization (horizontal, vertical, or circular) See Antenna.

Precision Offset Carrier See Transmitter.

Prime Time Access Rule (PTAR) See Programming.

Programming Among terms dealing with

broadcast programming needing definition are *family viewing (FV) time*, the period from 7 P.M. to 9 P.M. in most parts of the country, which, starting in 1975, was to contain only content suitable for the entire family, particularly children. This standard was written into the *NAB Television Code* after considerable pressure from Congress and others concerned about the possible effect of violence and sex content on children, and after FCC Chairman Wiley encouraged network attention to the problem. Wiley's "encouragement" was a factor in a federal judge's decision late in 1976 that individual stations should control their own programming; concerted or mandatory (NAB code) restrictions were illegal. *PTAR*, or the *Prime Time Access Rule*, was a 1974 FCC action that required affiliated stations to program at least one hour during prime time, 7 P.M. to 11 P.M. in most areas, from non-network sources, to encourage a diversity of programming and programming sources. When a program is *stripped* or *across the board*, it is scheduled at the same time each weekday. Many non-network programs are *syndicated*—either *off-network*, having been shown on a network in the past, or original—and sold to individual local stations. A *spin-off* is a program developed around a character or a situation in a successful program. A program *package* is the program idea, writers, stars, director, and so forth assembled by a *packager* for production or sale to a network or for syndication.

Propagation *See* Waves.

Public Access *See* Cable.

Public Affairs *See* News.

Public Broadcasting System (PBS) *See* Network.

Public Interest, Convenience and/or Necessity *See* Allocation.

Public Television *See* ETV.

Public Utility *See* Common Carrier.

Pulse Modulation (PM) *See* Modulation.

Quad Head (Quadruplex) *See* Recordings.

Quadrasonic *See* Modulation.

Radiation, Conduction, Induction Electricity

can travel from one point to another in a variety of ways. *Conduction* requires a conductor, usually a piece of wire, to carry the current. However, something not specially prepared as the conductor can also serve, as, for example, the earth, salt water, or some other common circuit ground. *Induction* uses the principle that an object may be electrified, magnetized, or given an induced voltage by exposure to a magnetic field. During the 1800s several experimenters, particularly Nathan B. Stubblefield, arranged two loops of wire a distance apart and sent an electrical signal through one of them. The resulting magnetic field was picked up by the other loop, some distance away—up to three miles in some cases. Although the method was generally used for **Morse code**, speech could be transmitted in this way. Most of the energy in an induction field is, however, contained in the vicinity of the transmitting loop. At higher frequencies, it is possible to *radiate*—diffuse from a center, as when a balloon is blown up—the signal for great distances. Generally radio communication requires frequencies above those used for telegraph or voice, although any radio frequency may undergo **modulation** with the audio frequencies of speech and allow the code or the speech to ride piggyback on the radio frequency wave.

Radio, Radiocommunication A general term applied to the use of electromagnetic, or Hertzian, waves to communicate. An earlier term was *wireless*.

Radio Broadcasting Strictly speaking, multiple-address radio telephony (*see* Broadcasting).

Radiotelegraphy *See* Telegraphy.

Radiotelephony *See* Telephony.

Radio Television News Directors Association *See* Unions.

Ratings Estimates of audience size and composition used to measure the popularity of programs. Ratings are compiled by a *rating service* such as A. C. Nielsen or Arbitron or, in earlier years, the Cooperative Analysis of Broadcasting, C. E. Hooper, and others. Methods include telephone calls that are *coincidental* with the program, *diaries*, and various kinds of recorders. The results are expressed either as *rat-*

ings—proportion of all television homes that are tuned to a given program—or *share*—proportion of homes using television at that time that are tuned to the particular program—and frequently include additional demographic data of value to advertisers.

Receiver A device for the reception of electromagnetic waves carrying modulated radiocommunication signals, generally including (or attached to) an antenna; tuning components; a detector; and enough amplification stages to permit use of a loudspeaker. Among the earliest devices for detecting radio waves were the *galvanometer*, a sensitive meter which would show, by deflection of the meter's pointer, when a signal was present, and the *coherer*, a glass tube containing metallic filings that would clump together or cohere when an electric current passed through. A *tapper* or *decoherer* would disperse the filings between each dot or dash. Later, the *crystal set* (see Vacuum Tube) was employed, since electric current could flow only in one direction through it and it did not need decohering. The diode vacuum tube supplanted the galena or other crystal for this purpose. Greater and greater *selectivity*—the ability to choose between competing signals—and *sensitivity*—the ability to receive weak signals—were obtained with the *regenerative*, *superregenerative*, *heterodyne*, and *superheterodyne* receiver circuits. Receiving sets using the last named circuits worked most efficiently at a single frequency, the *intermediate frequency* or *IF*, no matter what the frequency of the station being received. In essence, this type of receiver used a *local oscillator* to generate a "local" radio frequency signal within the set, which would be a certain number of kiloHertz—the value of the IF—above or below the frequency of the station to which the receiver was tuned. In tuning to the frequency of the desired station, one would automatically change the local oscillator or transmitter since the same knob controlled both tuning condensers. The two frequencies would "beat" against one another, leaving the resultant intermediate frequency, the difference between the two signals, which would always be the same. The generally relatively low IF—a common frequency used in AM radios today is 455 kHz—permits simple and rugged design of

components and, beyond the tuning stage, use of only one frequency. The equipment can be designed for that one frequency rather than to correspond with the broad range of frequencies used by the various transmitting stations within range. As a result, almost all radio receivers today combine tuning or radio frequency (*rf*) stages, a detector stage, and a number of intermediate frequency and audio frequency (*af*) stages of *amplification*—boosting the signal without otherwise changing its characteristics. The word "receiver" is now commonly used for high-fidelity tuner-amplifier combinations that are attached to external loudspeakers, with the word "radio" used for cheaper self-contained units. A television receiver is similar to a radio receiver in function: the desired channel is tuned in much as in the radio receiver and the resulting signal is eventually fed to the picture tube (kinescope) and loudspeaker for reproduction of the picture and sound.

Receiving Station See Station.

Record Communication A term to distinguish nontransient communication. For example, the telegraph is a record communication; the telephone is not. Film is a record communication; "live" television is not.

Recordings Reproduction of musical or other performances stored in the form of magnetic patterns in tape, or grooves in plastic discs. A number of other forms of recording—even writing falls in the category—are used in broadcasting. The earliest sound recordings were made on wax cylinders. Later, discs, usually 10 inches or 12 inches in diameter, running at 78.26 rpm were used. The *electrical transcription (ET)*, used for broadcast programming for many years, consisted of a 15-inch or 16-inch disc revolving at 33 $\frac{1}{3}$ rpm, which gave 15 minutes of playing time per side using standard width grooves. In the late 1940s, Peter Goldmark and a CBS Laboratories team developed the *LP (long-playing)* record for home use. It was 10 inches or 12 inches in diameter and revolved at 33 $\frac{1}{3}$ rpm but used an extremely fine *microgroove* that enabled one side to hold more than 20 minutes of music. RCA attempted to market a 7-inch, 45-rpm microgroove disc with an oversize center hole, but after a long strug-

gle it was restricted to popular music, one tune to a side, and the 78-rpm disc was phased out. *Reel-to-reel* magnetic tape recording derived from magnetic wire recording machines and from steel tape continuous loop recording machines used for such things as telephone weather forecast announcements in the early 1940s. Reel-to-reel sound recordings are being replaced in homes with easier to handle, self-contained devices that give good sound reproduction. The most common such device is the twin-hub *cassette*, in which the tape is permanently threaded on supply and takeup reels and the entire unit is placed over shafts driven from the motor. Another is the single-hub *cartridge*, which, although a bit bulkier and more complex, plays multichannel music with higher fidelity and is even easier to insert in the playback device than the cassette.

Television or video recording originally consisted of the *kinescope* (television picture tube) *recorder*, in which a motion picture camera photographed the images on a television picture tube. The quality of the resulting *kine* was not high, partly because our television system scans 30 complete pictures a second but a sound movie camera photographs only 24 frames per second. In the late 1950s, magnetic *videotape recording* (VTR) was developed, revolutionizing the industry. The first bulky *quad head* or *quadraplex* videotape recorders used a revolving assembly of four record-playback heads over which 2-inch tape was transported at 15 or 7½ inches per second (ips), with the heads briefly overlapping as they turned at high speed, providing a picture almost indistinguishable from "live." Later, the *high band VTR*, which used a high-frequency—10 MHz—carrier, yielded a very high signal-to-noise ratio, and its excellent interference-free picture enabled more *generations* (successive duplicates) to be made from the original recording, or *master*. Color recording and electronic editing to the exact frame desired are now possible on even the relatively inexpensive *helical scan* VTRs used for industrial and educational purposes. In these VTRs the tape is wrapped in a spiral (helix) around a large diameter, fixed drum, within which a record-playback head revolves. Helical scan VTRs are much less expensive than the

quad head machines and take ½-inch, ¾-inch, and 1-inch tape as well as 2 inch but at the expense of image quality. First used for stop-action recording during sporting events, the various kinds of *videodiscs* now being developed—thin, flexible, plastic discs used to record and play back video and audio material by magnetic, *laser*, or other complicated processes—are expected eventually to be used in the home in the same way as musical recordings. Since there is no agreement on technical standards, even with videodisc's many potential advantages—inexpensive materials, simple duplication processes—it has not yet replaced videotape *cartridge* and *videocassette* systems for short—and even long—messages in home machines. Although the use of *time based correctors* now permits relatively inexpensive VTRs to be used, it seems probable that the broadcast industry soon will settle on a new 1-inch professional machine as its standard.

Rectifier See Vacuum Tube.

Rediffusion See Cable.

Reel-to-Reel See Recordings.

Regenerative See Receiver.

Register See Copyright.

Relay See Network.

Relay, Sounder See Circuit.

Remote A broadcast or part of a broadcast that originates from outside the studio. In the United Kingdom, a remote is called an *outside broadcast* (OB). In the early days of radio, such a broadcast was called a *Nemo*, presumably reflecting telephone company usage—"not emanating main office"—although possibly associated with the "Little Nemo" comic strip about fanciful dreams off in the middle of nowhere. (See ENG and News.)

Resolution See Television Signals.

Resonating Frequency See Waves.

Return Wire See Circuit.

Reuters See News.

rf (radio frequency) See Receiver.

Rotary Arc See Transmitter.

Royalties *See* Invention.

Safety and Special Services The FCC traditionally divides the radio stations under its supervision into **broadcasting, common carrier,** and safety and special services—a term that includes every other kind of user from amateur to police.

SAG (Screen Actors Guild) *See* Unions.

Satellite A body in orbit around another, larger body. Often used in a political sense (“the Soviet Union’s satellites of Poland, East Germany . . .”), the word has two meanings that concern broadcasting. First, artificial *space communications satellites* are launched by rocket into an orbit approximately 22,300 miles above the equator. This height and orbit enable them to remain stationary (*synchronous*) with respect to one spot on the earth’s surface and high enough to “see” roughly one-third of that surface. Hence, line-of-sight radio frequencies can be used to cover entire continents or oceans. These satellites can *relay* virtually any kind of electronic signal—telephone, television—point to point from one large earth station to another. Experiments have been successfully conducted with small receive-only **antennas** at pay-cable (*see* Pay-TV) installations, network affiliates, and remote villages and towns. Direct satellite-to-home broadcasting appears to be some years away because of the need to increase power in the satellite and provide special antennas on rooftops. Second, a satellite is a television station that does not originate its own programming but retransmits the programs of a parent station. Satellite television stations operate on a channel regularly assigned to their community and not on the parent station’s channel, as do *boosters*, or on one of the upper UHF television channels with very low power, as do *translators*, which “translate” the parent station’s signal up to the high UHF.

Scanning *See* Television’s Early Technological Development *and* Television Signals.

Scrambling *See* Pay-TV.

Screen Directors Guild *See* Unions.

SECAM (Séquential Couleur à Mémoire) *See* Television Signals.

Secondary Station *See* Channel.

Selectivity *See* Receiver.

Selenium *See* Television’s Early Technological Development.

Semaphore A device for sending coded signals visually by means of flags, lights, or mechanically moving arms. Developed to a high degree of efficiency in the century before introduction of the electrical telegraph, semaphore today survives to a limited extent in the navy, where signal lamps using Morse code have taken over from the sailor who holds two small flags and moves them to a different position for each letter, and in railroading, which uses a simple code based on the position, ranging from vertical to horizontal, of short paddles on towers.

Sensitivity *See* Receiver.

Series *See* Circuit.

SESAC (originally Society of European Stage Authors and Composers) *See* Copyright.

Service Drops *See* Cable.

Share *See* Ratings.

Short-circuit *See* Circuit.

Shortwave *See* Waves.

Sidebands *See* Modulation.

Sign *See* Communication.

Signal Sometimes referring to any transmission (including one without intentionally encoded information or desire for **communication**), generally refers either to a message or to the actual electromagnetic wave propagated from a **transmitter**. The mere presence of a carrier wave signal indicates the important fact that a transmitter exists, but, technically, information is carried in the **modulation** of the signal, and not in the signal itself. *Noise* in a channel is that which can interfere with reception of a message. Generally, noise is either electrical/mechanical (such as *static*) or semantic (imperfect agreement on the connotations and denotations of symbols or signs). The *signal-to-noise ratio (S/N)* is often used to describe the relative amount of interference in a given channel. “**Silent Night**” *See* DX-ing.

Single Sideband (SSB) *See* Modulation.

Skip *See* Waves.

Skywave *See* Waves.

Solid State *See* Transmitter and Vacuum Tube.

Space Communication Satellite *See* Satellite.

Spark Gap *See* Transmitter.

Spectrum *See* Waves and Bandwidth.

Spin-off *See* Programming.

Sponsored *See* Network.

Spots *See* Network.

Static *See* Allocation and Signal.

Station The place or position from which a service is provided or operations are directed; in other words, a *transmitting station* in a given radiocommunication service. A *receiving station* is the place—the home, the car—where a receiver is located.

Station Break, Station ID *See* Network.

Stereophonic *See* Modulation.

Stereoscopic *See* Television Signals.

Storecasting *See* Modulation.

Subcarriers *See* Modulation.

Subsidiary Communications Authorization (SCA) *See* Modulation.

Superheterodyne *See* Receiver.

Superpower In the United States, any standard (AM) broadcast station that uses more than 50 kw of power. Only one such station, WLW (Cincinnati), has operated here, from 1935 to 1939, when the U.S. Senate frowned on superpower. However, the proposal remains active, and such stations operate in other countries, notably Mexico. In the 1920s, the term referred to lesser amounts of power.

Superregenerative *See* Receiver.

Sustaining *See* Network.

Symbol *See* Communication.

Synchronizing *See* Television Signals.

Synchronous *See* Satellite.

Syndicated *See* Programming.

Talent A generic term referring to a person or persons appearing on radio or television as actor, announcer, singer, performer, on-air news reporter, and so forth. This meaning is the one most commonly used in broadcasting; it probably is derived as a sarcastic extension of the dictionary definition, which refers to persons with gifts, aptitudes, or abilities of a superior quality.

Tapper *See* Receiver.

Telecommunications Any transmission, emission, or reception of signs, signals, writing, images, and sounds or intelligence of any nature by wire, radio, visual or other electromagnetic systems of communication.

Telegraphy A telecommunication system for the transmission of written matter by a signal code, through a wire channel unless the term *radiotelegraphy* is used to signify use of a **radio-communication** channel.

Telephony A telecommunication system for the transmission of speech or other sounds, through a wire channel unless the term *radio-telephony* is used to signify use of a **radiocommunication** channel.

Teletype *See* News.

Television A telecommunication system for the transmission of transient images of fixed or moving objects; also the broadcast service of the same name, which includes both the picture and the accompanying sound.

Television Camera Tubes Although the original television pickup devices, which converted light energy into electrical energy, were mechanical (*see* Television's Early Technological Development), all-electronic camera tubes were devised and introduced in the late 1930s. These were generally of a storage-discharge type, storing the light falling upon the tube face and then discharging it into the system by scanning the storage element with an electron beam. The all-electronic camera tubes included the *Iconoscope* of Vladimir Zworykin (RCA), and the *Image Dissector* of Philo Farnsworth. These were combined into the *orthicon* and *image orthicon* tubes by RCA engineers in the early 1940s. The *image orthicon* (*IO* or *orth*) tube, in use for more than a quarter-century, was replaced for high-

quality broadcast uses by the *Plumbicon*, which used a lead oxide—Pb is the symbol for lead—for a key part, and for industrial and other nonbroadcast uses by the lower resolution quality (see Television Signals) and less sensitive—needing more light for a good picture—*vidicon* tube. The vidicon is used in *film chains*—motion picture and slide projectors are *multiplexed* through an optical device that focuses two or more sources of program material at a small vidicon television camera—in television studios because light levels from film or slide projectors are high and can be controlled. A *kinescope* is either a television picture tube used at the receiver end of the system or a kind of television recording.

Television's Early Technological Development Television's first practical technological development was recorded when English telegraph engineer Joseph May discovered in 1873 that the element *selenium* was capable of producing small amounts of electricity in direct response to the amount of light falling on it. His supervisor, Willoughby Smith, notified the prestigious Society of Telegraph Engineers in England, and today both men are given credit for the discovery.

Within a couple of years, various inventors designed methods for putting this discovery to work in a television system. Although the actual devices were imperfect, the principles were straightforward. G.R. Carey of Boston in 1877 proposed a crude imitation of the human eye: a bank of selenium cells and lamps that could be used for breaking up pictures and sending the elements over wire. Three years later English scientists Ayrton and Perry tried out such a mosaic device. Fournier and Rignoux first transmitted actual images in France in 1906. Following the telephone's invention by Alexander Graham Bell, who had also experimented with the use of lightwaves rather than wire to transmit voice, inventors in several countries proposed or demonstrated a rash of television—or still picture, non-moving, **facsimile**—devices.

Some of these, like today's animated advertising signs, used a wire to connect each selenium cell—the pickup device, analogous to

one facet of the eye—with a small electric lamp—the reproduction device, in a *mosaic*. The more lamps, the more detail could be put into the picture. In some versions the lamps simply were “on” or “off,” while in others their intensity varied in direct response to the different intensities of light projected on each cell. This approach, experimented with for many years, required an impractical amount of wiring and a mechanically awkward arrangement of cells and lamps. To reproduce a picture equal in detail to a 23-inch television screen of today would require more than 350,000 lamps, each not more than one-fortieth of an inch in diameter!

French scientist Maurice Leblanc developed a technique in 1880 to avoid this quandary, using the principle of *scanning*, in which each picture element was viewed successively, rather than all at once as in the mosaic devices. Each picture was divided into lines and each line into minute segments. His approach was analogous to the solution of a similar **bandwidth** problem in telegraphy.

By 1884 basic principles of scanning had been incorporated in some *mechanical* devices. L. B. Atkinson's apparatus employed a drum fitted with tangential mirrors, each successive mirror being oriented through a small angle so that, as the drum rotated, the picture would be scanned in a series of lines that would be projected on a single selenium cell. The resulting electrical output of the cell could be transmitted over a wire circuit, as at this time there were no wireless transmission devices. As with all television systems, rotating drums at both ends of the circuit had to be *synchronized* in order to transmit the image successfully. No full description of Atkinson's device was published, and many writers give credit for the mirror drum to a European, Lazare Weiller, who proposed a similar system in 1889. The scanning disc and other devices quickly overshadowed the *mirror drum*, although experimenters used it for many years—E. F. W. Alexanderson of General Electric as late as 1927.

The scanning disc, basis for almost all mechanical scanning systems for several decades, was invented in 1883 and patented in early 1884 in Germany by Paul Nipkow. Lacking the money to extend the patent on his

“electrical telescope,” he allowed it to lapse, and worked for the next 32 years as an engineer for a German railway signal company. Although he lived until 1940 and is generally recognized as the inventor of the system that could reproduce moving objects, Nipkow never built a working model of a complete transmission-reception system, since he lacked means of synchronizing the discs, adequate light sources, amplifiers, photocells, and all the sensitive and increasingly complicated tools of later experimenters.

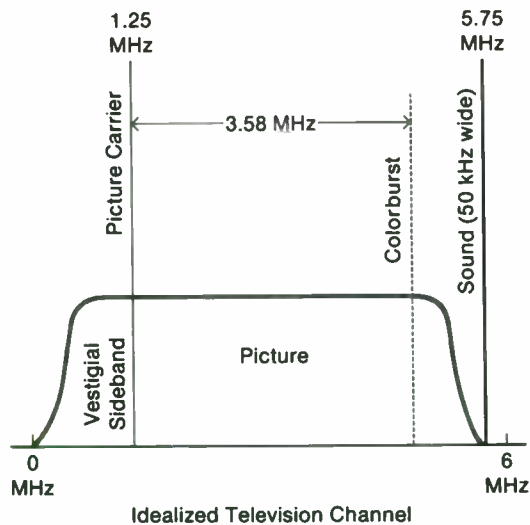
The *Nipkow disc* looked like a phonograph record, perforated with a single spiral of small holes, each hole a fraction of an inch closer to the center of the disc and a fraction of an inch farther along the rim of the disc than the preceding one. When the disc was placed directly between a narrow-beam light source (although sunlight and gas lamps were used, the electric lamp was the most common) and an object and then rotated, the light would shine through only one hole at a time. In one complete turn, the narrow beam would illuminate every part of the object, moving across it in what appeared, because of the speed of rotation and the persistence of vision, as slightly curved lines or streaks. In practice, the light merely illuminated the object, and a selenium cell—after 1888, a more sensitive device called a *photocell*—“looked” at the scene through each hole as the disc revolved. At the receiving end, a neon lamp varied rapidly in brightness in response to the current produced by the photocell, and the viewer observed it through a Nipkow disc rotating in synchronization with the disc at the other end of the circuit. A mask, of the same size at both ends of the circuit, blocked out part of the disc and focused both the cell and the viewer’s eye at the same relative place. Persistence of vision caused the combination of varying intensity neon lamp and rapidly spinning disc to reproduce a crude picture of the original object in the viewer’s brain. The picture, at first, was only an inch or two wide, being limited chiefly by the size of the holes, the diameter of the disc, and the speed of rotation—each of which led to mechanical problems. (See also **Bandwidth, Television Signals, and Television Camera Tubes.**)

Television Signals The *resolution* or sharpness of a television picture is measured in terms of *picture elements*. In gross terms, the resolution of a picture is the product of the number of horizontal *lines* scanned for each picture times the number of complete pictures, sometimes called *frames*, analogous to frames of a motion picture film, per second. However, the 525 lines used in a *NTSC* (National Television Standards Committee) system are *interlaced*—much as one interlaces his or her fingers by placing those on one hand between those on the other. First the odd-numbered lines are transmitted and then the even-numbered so that in one second we actually see 60 pictures or *fields* of $262\frac{1}{2}$ lines each. Because of the persistence of vision in human beings, transmission of 60 half-fields produces a moving picture with better resolution, particularly when something on the screen is moving rapidly, than a 30-frame or a non-interlaced system. The use of 60 pictures per second permits locking or *synchronizing* the picture in the studio to the picture at home through the 60-Hz power line frequency. A strong synchronizing signal, produced by a synchronizing or *sync* generator at the studio or transmitter, does most of the work in keeping the picture at home in step with the one in the studio. In *scanning* a scene, the beam of electrons in a television camera tube sweeps across the target, onto which the scene is focused by a lens, from left to right and then, during the *blanking interval*, returns to the left without generating a signal, drops down two lines, because of interlacing, and sweeps across again. The *aspect ratio*, or the ratio of horizontal to vertical size, of a television picture is 4:3. Although *three-dimensional (3-D)* or *stereoscopic* television was experimented with as early as 1926, it is not now in use.

Now common, *color* was also the subject of experiments in the 1920s. In early times the image was focused through a spinning *color wheel* that fed each primary color in turn to one pickup tube. A modern studio color television system uses a system of filters to feed primary colors—red, green, blue, or sometimes their complements—to each of three camera tubes. Less expensive industrial systems use one-tube cameras. Very little additional bandwidth is re-

quired for the *colorburst* signal component of a television signal, since it is merely an instruction to the receiving set to produce various strengths of color signal at a given instant. Standards differ for television around the world; some countries use our NTSC (525 lines, 30 frames); Eastern Europe uses one form of 625/25 and western Europe a slightly different one. The British are closing out the 405/25 system they have used since the 1930s in favor of 625/25, and the French also are dropping their 819/25 system. Other standards were used prior to World War II. Three color systems—*NTSC*, *PAL*, originally a German system, and the French *SECAM*, also used in Soviet Russia—are in use. The *field sequential* system was the original color system, since the lower speeds (60 fields rather than 15,750 lines per minute) were easier to use with mechanical color wheels. The *dot sequential* system is presently in use, since color picture tubes are now made with hundreds of little triangles consisting of red, green, and blue chemical *phosphor* dots that glow when hit by the focused electrons from the *guns* in the tube. However, the camera actually used by the astronauts during moon landings in the early 1970s was field sequential.

The channel for a 525/30 system is 6 MHz wide, but the actual picture needs only



approximately 4 MHz. The rest of the channel is taken up with the sound portion of the transmission, *guard bands* to reduce interference from stations on adjoining frequencies, and a *vestigial sideband*—when present television transmission standards were adopted in 1941, NTSC engineers attempted to save frequency space by using only one sideband and a carrier, but the state of the art forced them to “waste” 1.25 MHz by providing a second sideband of reduced size and no appreciable value.

Trade Secret See Invention.

Transceivers See Transmitter.

Transistor See Vacuum Tube.

Transitcasting See Modulation.

Translators See Satellite.

Transmitter A device for radiating signals that might be received at a distant location. (The term is also used for the portion of a telephone that is spoken into). It is fed or controlled by a microphone or other speech input equipment, or a telegraph key, or some other source of signal, and feeds to an antenna a composite signal that usually consists of a *carrier wave*, *modulated* by (has superimposed upon it) the intelligence that one desires to transmit or send.

The earliest radiotelegraph transmitters employed the *spark-gap* principle whereby a high current or voltage jumps across a gap in a wire or other conductor. This spark will radiate over a wide band of frequencies, much as a bolt of lightning does. But when tuned to some extent, and fed into an antenna of a certain wavelength, the spark cannot be detected over nearly as wide a band as lightning, thus conserving spectrum space. In the earliest transmitters, the spark was controlled by a telegraph key to produce dots and dashes. The *rotary arc* transmitters, developed later, were motors designed to produce an almost continuous arc, which could be fed to the antenna by a key. Because arcs offered a gentler approach to radiotelegraph than the spark gap, they—particularly the Poulsen arc—continued in use into the 1930s, generally aboard ships needing medium-range transmissions. The Alexander-son and other *alternators* (alternating current generators) were often pickup-truck-sized ro-

tary electrical generators driven by motors at speeds, and hence frequencies, so high that they could send energy a long distance by radiation from an antenna without using wires. The Alexanderson alternator spun so fast that the output was of a frequency of alternations more than one thousand times that of the 60-Hz power supplied to houses today. Designed for transoceanic communication from fixed installations on shore, it was very reliable, efficient, and expensive. The current from the alternator could be fed to an antenna much more efficiently than could the broader signal from an arc transmitter, and attempts to secure exclusive use of the Alexanderson machine played an important role in establishing radio in this country.

Just before World War I the first practical high-powered *vacuum-tube transmitters* were tried, and a few years later they were placed in commercial service. **Vacuum tubes** permitted virtually silent operation, voice transmissions, and smaller, even mobile or portable, size. Although many low-power transmitters and *transceivers*—*transmitter* and *receiver* combined in a single unit, such as a walkie-talkie or a Citizens Band set—have used *solid state* technology for years, high-power broadcast transmitters with solid state devices rather than vacuum tubes were not available until the mid-1970s.

Early broadcast transmitters did not have many features we take for granted, such as limiters to prevent overloading or overmodulating the transmitter. Until 1925 or so transmitters were *tuned*, much as a radio receiver is tuned, and often drifted off frequency and caused interference to other stations. Eventually, *crystal control* was perfected—a technique based on the capacity of a quartz crystal of a given thickness to force a current flowing through it to vibrate at a certain, determined frequency. When mounted in an enclosure that kept the crystal at an even temperature and prevented heat expansion or contraction, the unit held the station at a specified frequency. Transmitters with crystal control for broadcast and other uses caused less interference. One of the FRC's first orders of 1927 required crystal control and other standards for broadcast transmitters. A technique known as *precision*

offset carrier permits television stations on the same channel to be located a few miles closer to each other without interference. (See also **Modulation, Waves**.)

Transmitting Station See Station.

Triode See Vacuum Tube.

Tropospheric Forward Scatter See Waves.

Trunk Lines See Cable.

Two-way Cable System See Cable.

Unions Labor unions are plentiful in broadcasting and even more plentiful in the motion picture industry, which provides so many television programs. Among the most prominent are *AFTRA*, the American Federation of Television and Radio Artists (formerly *AFRA*), which serves announcers, actors, and other talent; *AFM*, the American Federation of Musicians, which has jurisdiction over virtually all musicians and a small number of turntable operators in Chicago radio stations; *IATSE*, the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada, whose members range from stagehands on Broadway and motion picture projectionists to television technical crews (cameramen, and so forth), particularly in New York; *IBEW*, the International Brotherhood of Electrical Workers, which also represents many technicians; and *NABET*, the National Association of Broadcast Employees and Technicians. Originally *NABET* stood for National Association of Broadcast Engineers and Technicians; the change from "engineers" to "employees" marked the trend in many unions to represent a broad range of job categories in a given station. A number of actors and singers belong to either *Actors Equity* or *AGVA*, the American Guild of Variety Artists. The Screen Actors Guild (*SAG*), the *Writers Guild of America* (West and East), and the *Screen Directors Guild* also have jurisdictions in broadcasting, but only the larger stations, networks, and program packagers, particularly those based in Hollywood, have direct connections with them. Although the networks may deal with dozens of different unions, most stations contract with only one or two or even none, with

the technical and clerical staffs often represented by the same union. A few union contracts may affect the entire industry but most are negotiated for the individual market. A professional association, such as the *Radio Television News Directors Association (RTNDA)*, is not, strictly speaking, a union organized for collective bargaining purposes.

UPI (United Press International) See News.

Vacuum Tube Before the *transistor* and *integrated solid state circuits* and devices came into almost universal use in the 1960s and 1970s respectively, the vacuum tube performed the essential functions of *electronic detection* and *amplification*. Today, only the picture tube in a television set is still a vacuum tube. Modern solid state devices—the *transistor* and later developments such as *integrated circuit chips*—are essentially grown in laboratories and then cut apart, rather than manufactured, but fill the same functions as the vacuum tube.

Yet, without some kind of one-way *valve*—still the name for the vacuum tube in Great Britain and elsewhere—to permit only the positive half of each cycle of radio-frequency alternating current waves to pass, it would be impossible to *demodulate* or permit the audio-frequency signal superimposed on the radio-frequency waves to be detected. (A *rectifier*, used to convert *alternating current (AC)* to *direct current (DC)* for power supplies and other uses, works the same way, whether vacuum tube or solid state.) The *crystal set*, used as a **receiver** from the earliest days of radio until the 1930s, was a primitive *solid state* device that used as a *detector* a piece of galena or some other crystalline ore that would allow current to pass in only one direction.

The other major function of the vacuum tube, one that permitted today's selectivity and sensitivity, is amplification, the strengthening of a signal or current without otherwise changing its characteristics—much as power steering in an automobile amplifies the turning motions of the driver.

The principles of vacuum-tube theory are simple: opposites attract and likes repel, just as with a pair of bar magnets; electrons are negative by definition; and the amount of re-

pellling or attracting is roughly proportional to the voltage applied to that part of the tube. Thomas Alva Edison first noticed the actions of electrons within a glass tube evacuated of air. The *Edison effect* is the blackening of the glass wall of a tube caused by the electrons boiling off the glowing wire of the *filament* within an electric light bulb and striking the glass hard enough to blacken it. Ambrose Fleming inserted a second element, known generally as the *plate*—although technically it was an *anode* and the filament a *cathode*—in the glass bulb and discovered that, when a positive charge was placed on the plate, a current would flow between the filament and the plate but that no current would flow when a negative charge was applied. The device converted the weak AC radio currents picked up by an antenna attached to the plate to a pulsating DC and delivered the audio component that had been used to modulate the radio waves as sounds—dots and dashes or speech—in a pair of ear-phones. His device was known as the *diode* (two electrodes) or *Fleming valve*.

Lee de Forest, in the first decade of the twentieth century, discovered how to amplify weak electronic signals. If a grid or mesh of fine wire was placed in the tube between the filament and the plate, a weak negative voltage on that grid would repel the electrons coming from the filament. A condition of no voltage on the grid would permit the maximum current to flow between the filament and the plate. Varying voltage on the grid would permit varying current flow in the main circuit. Accordingly, a weak current flow from an antenna or microphone or other source fed into the grid in such a way as to vary from zero to slightly negative would cause the extremely strong current flow in the main circuit to vary in precisely the same way—or, in other words, the weak input current was “amplified.” De Forest called his tube an *Audion*, but the generic name is *triode*—a three-element or three-electrode vacuum tube.

Although there have been improvements: a separate *cathode* wrapped around the filament that acts as an oven, permitting a more even flow of electrons; increased complexity: two or three separate circuits within the same tube, generally operating with the same fila-

ment source of electrons; smaller sizes, and more rugged construction: sometimes metal or ceramic instead of glass—all vacuum tubes use the same basic principles.

Vacuum Tube Transmitters See Transmitter.

Valve See Vacuum Tube.

Vestigial Sideband See Television Signals.

Video Of, or pertaining to, the visual or picture portion of television.

Videocassette See Recordings.

Videodiscs See Recordings.

Videotape Recording (VTR) See Recordings.

Vidicon See Television Camera Tubes.

Volts See Circuit.

Watts See Circuit.

Waves, Propagation, Frequency, Wavelength All *electromagnetic waves* or *electromagnetic energies* travel at 300,000 kilometers per second in free space, roughly 186,300 miles per second, and a fraction slower in wire or other materials. What distinguishes these waves or parts of the *electromagnetic spectrum*—radio, infrared, visible light, ultraviolet, X-rays—from one another is their length, the actual distance from crest to crest or trough to trough. If one uses the analogy of water waves traveling at a constant speed breaking on a seacoast, it becomes obvious that as the wavelength grows, the number of waves per unit of time will drop proportionately, and vice versa. Hence, *long-wave* = low frequency; *shortwave* = high frequency; *microwave* = upper ultra high frequency or beyond. (See chart, page 507.) Further, since wavelength, measured in meters, times frequency, measured in thousands of cycles per second, equals 300,000—the speed of light or electromagnetic radiation in kilometers per second—we find that the wavelength of frequencies used in the standard (AM) broadcast band ranges from more than 555 meters (approximately six football fields) long at 540 kHz down to only 187 meters at 1,600 kHz. As discussed under **antenna**, this has implications for equipment; a half-wave antenna in the middle of the very high frequency (VHF) band used for FM radio is only five feet long.

Because of the small size of tuning components at VHF or UHF frequencies (much as a combination of thickness and length of a musical tuning fork determines its pitch, so does a combination of two electrical values, capacitance and inductance, determine the *resonating frequency* of a piece of radio apparatus), the equipment is prone to drift off frequency as it heats up and metal expands. This is why early FM sets needed to be retuned after a period of use. Later sets avoided this problem with a combination of compensating circuits known as *automatic frequency control (AFC)* and the nonheating characteristics of most transistors.

Different wavelengths have different characteristics. Some—visible light—can be perceived directly by our senses but do not penetrate solid objects in the way that X-rays can. Some need a pathway, such as the wire used for 60-Hz electrical power, while others—radio and light—can travel or radiate in free space or atmosphere. Some will *attenuate*—that is, lose strength—very rapidly with distance, while others, if aimed or focused or guided carefully, will lose very little strength. Within that part of the electromagnetic spectrum used for radiocommunication, standard nomenclatures and characteristics apply (see box on page 507).

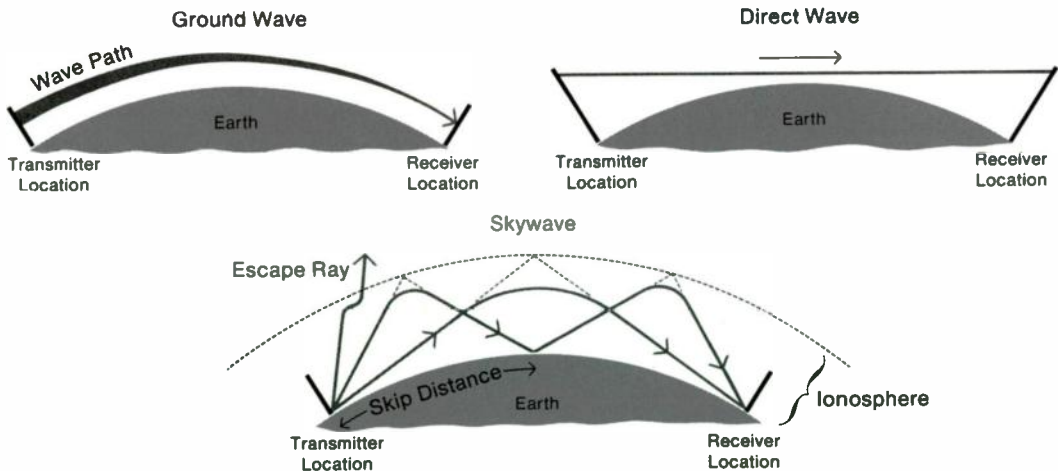
Radio waves occupy the electromagnetic spectrum below 100,000 MHz (megahertz, formerly designated mc, or megacycles per second). Above that part of the electromagnetic spectrum are infrared waves or rays, visible light (roughly 10^9 Hz), ultraviolet rays, X-rays, gamma rays and cosmic rays.

The standard (AM) radio band runs between 535 and 1,605 kHz (kiloHertz). FM radio broadcasting runs between 88 and 108 MHz; noncommercial educational FM is between 88 and 92 MHz. VHF television is in three segments: 54–72, 76–88, and 174–216 MHz (channels 2–4, 5–6, and 7–13). UHF television (and some other services near the upper end) occupies the band between 470 and 890 MHz. AM radio needs a bandwidth of 10 kHz; FM radio a bandwidth of 200 kHz; and television a bandwidth of 6 MHz.

Radio waves have three major means of *propagation*, and the efficiency of each varies

Frequency Scale	10 kHz	100 30	300	1,000 3,000	10,000 30	100 300	1,000 3,000	10,000 30,000	100,000 300,000	1,000,000 3,000,000
Wavelength Scale	10,000 meters	1000 m.	100 m.	10 m.	1 m.	10 cm.	1 cm.			
Band Name	VLF	LF	MF	HF	VHF	UHF	SHF	EHF		
Mode of Transmission	Ground Wave	A		B		C		D		
			E		F		G			
	Skywave	H		I						
							Quasi-optical Range (slightly past horizon)			

- Legend**
- VLF (very low frequency) below 30 kHz
 - LF (low frequency) 30 to 300 kHz
 - MF (medium frequency) 300 to 3,000 kHz (3 MHz)
 - HF (high frequency) 3 to 30 MHz
 - VHF (very high frequency) 30 to 300 MHz
 - UHF (ultra high frequency) 300 to 3,000 MHz
 - SHF (super high frequency) 3,000 to 30,000 MHz
 - EHF (extremely high frequency) 30,000 to 300,000 MHz
- (kilo = 1,000; mega = 1,000,000)
- A Long Range (500 miles or more)
 - B Moderate to Short Range Over Land, Moderately Long Range Over Water
 - C Short Range Over Land, Moderate Range Over Water
 - D Short Range (50 miles or less)
 - E Short Range, Day
 - F Medium Range, Day
 - G Long Range, Day
 - H Medium Range, Night
 - I Long Range, Night



Source: Adapted from President's Communications Policy Board, *Telecommunications: A Program for Progress* (Washington: Government Printing Office, 1951), page 22.

with the frequency of the wave. *Groundwave*, for example, which hugs and travels along the earth's surface, is good for long-distance communication—up to worldwide in some cases—particularly when the ground *conductivity* near the transmitter is high, as is the extreme case with salt water, on frequencies from ELF into the medium-wave standard (AM) broadcast band. From about the middle of the standard broadcast band through the shortwave band, to about 30 MHz or even a little beyond, the most effective long-range mode is *skywave*. These wavelengths are such that signals bounce off the ionized layers that surround the earth, the *ionosphere*, at between 50 and 250 miles of altitude, much as a flashlight beam will bounce off a mirror. The bounce or *skip* may be calculated—the angle of incidence is equal to the angle of reflection, and the height is known—and the desired target area pinpointed by directional antenna arrays—a technique used for international shortwave but not for domestic broadcasting. Skywave useful range varies with time of day, season, and sunspot cycle. At high frequencies and above, groundwave is limited to only a few miles under normal conditions. Above the frequencies at which skywave is reliable, radio propagation is limited to about 125 percent of the distance to the optical horizon or *line-of-sight*. This *direct wave* propagation is the reason for the limited range of FM and television stations, whose antennas are rarely tall enough to send good signals more than 100 miles. A fourth transmission mode, *tropospheric forward scatter*, can be used for extensive distances in very expensive and huge military point-to-point systems at VHF frequencies and beyond. It scatters and bounces through the troposphere, which extends downward to the earth's surface. Space communication *satellites* use frequencies in this *quasi-optical* range because, although far away in distance, they have an unobstructed line of sight to the earth station antenna—over one-third of the globe. Since on almost any band, the lower the frequency, the higher the practical range—partly due to greater ease of designing equipment for frequencies that are familiar and easier to work with—television channels 2–6 often may be received for a greater

distance than channels 7–13, and much farther away than frequently more powerful UHF television stations. This inequality in technical facilities for the same category or service of stations on the same band leads to economic, and consequently political, problems, particularly with respect to the standard (AM) band, where stations at the low end can expect more reliable groundwave coverage over a radius of around 100 miles than those at the high end. (*See also Bandwidth, Channel, and Modulation.*)

“Webs” *See* Network.

Whip *See* Antenna.

“Wired City” *See* Cable.

Wireless *See* Radio.

Wirephoto *See* Facsimile.

Wire Services *See* News.

Writers Guild of America *See* Unions.

**Historical
Statistics on
Broadcasting**



**Historical
Statistics on
Broadcasting**

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The tables on the following pages provide an overall view of many aspects of broadcasting history. Much of the data was originally assembled by L. W. Lichty (University of Wisconsin, Madison) and Sterling in 1967–1968. Some was published in different form in Lichty and Topping (1975), and more extended information on all of these categories except radio network programming appears in Sterling and Haight (1977). Specific sources are shown for all tables with a brief form used if the item is listed in the bibliography (Appendix D), or full citation if not.

Two points concerning all the tables: First, we have not noted all the exceptions or special cases which may occur in these tables but have pinpointed the more important. Second, where no information is shown, we have used the following system:

blank space	Indicates no such information (i.e., no television stations in 1921).
—	Zero or none.
na	Data unavailable, though theoretically the item or service did exist or may have existed.

**Table 1 Number of Stations:
1921–1977**

Table shows the number of stations actually on the air (regardless of license status) as of January 1 each year unless otherwise noted. Commercial and educational FM and VHF television were authorized in 1941, with UHF and noncommercial educational television appearing first in 1953. These figures should be used with some caution, as methods of counting varied with original source (Department of Commerce, FRC, FCC, or one of the commercial data firms). Basic station data here match that used on network affiliate tables 2 and 3 in this appendix.

A / AM Radio Stations through 1940

1921	5	1931	612
1922	30	1932	604
1923	556	1933	599
1924	530	1934	583
1925	571	1935	585
1926	528	1936	616
1927	681	1937	646
1928	677	1938	689
1929	606	1939	722
1930	618	1940	765

B / Broadcasting Stations since 1941

Year	AM Radio	FM Radio		Television		Total
		Commercial	Educational	Commercial	Educational	
1941	831	18	2	2 (July 1)		853
1942	887	36	7	4		934
1943	910	41	8	8		967
1944	910	44	8	8		970
1945	919	46	8	8		981
1946	948	48	9	6		1,011
1947	1,062	140	10	12		1,224
1948	1,621	458	15	16		2,110
1949	1,912	700	27	51		2,690
1950	2,086	733	48	98		2,965
1951	2,232	676	73	107		3,088
1952	2,331	637	85	108		3,161
1953	2,391	580	98	126		3,195
1954	2,521	560	112	354	2	3,549
1955	2,669	552	122	411	11	3,765
1956	2,824	540	123	441	18	3,946
1957	3,008	530	125	471	23	4,157
1958	3,196	537	141	495	28	4,396
1959	3,326	578	151	510	35	4,600
1960	3,456	688	162	515	44	4,865
1961	3,547	815	175	527	52	5,116
1962	3,618	960	194	541	62	5,375
1963	3,760	1,081	209	557	68	5,675
1964	3,854	1,146	237	564	85	5,886
1965	4,044	1,270	255	569	99	6,237
1966	4,065	1,446	268	585	114	6,478
1967	4,121	1,643	296	610	127	6,797
1968	4,190	1,753	326	635	150	7,054
1969	4,265	1,938	362	662	175	7,402
1970	4,292	2,184	413	677	185	7,751
1971	4,343	2,196	472	682	199	7,892
1972	4,374	2,304	511	693	213	8,095
1973	4,395	2,411	573	697	230	8,306
1974	4,407	2,502	652	697	241	8,499
1975	4,432	2,636	717	706	247	8,738
1976	4,463	2,767	804	710	252	8,996
1977	4,497	2,873	870	728	256	9,224

Sources: For AM radio: FCC figures as reported in *Broadcasting Yearbook 1977*, page C-312 (note: includes educational AM stations, which after 1940 consistently totaled about 25 stations a year); data for 1921–1926 covers “total authorized” stations for years shown. 1927–1947 stations are “authorized” and/or “licensed,” not necessarily “on air.” 1923 data for March 1, 1924 data for October 1, 1925 data for June 20 and 1926–1932 data for June 30, with 1927–1932 data taken from *FCC Annual Report (1936)*, page 57. For FM radio (commercial): *ibid.* For FM radio (educational): Corporation for Public Broadcasting, *Status Report on Public Broadcasting 1973* (Washington: CPB, 1974), page 8; and FCC figures reported in *Broadcasting*. For television (commercial): FCC figures as reported in *Television Factbook*. For television (educational): *ibid.* 1941–1947 data gathered from FCC by Lichty and Sterling except for FM radio (educational). Although most data derive from FCC records, for many years *Broadcasting Yearbook* and *Television Factbook* published divergent figures. We have chosen to follow *Television Factbook* for AM radio from 1960 through 1975, with supplementary data from *Broadcasting* magazine. FM data for 1973 and 1974 from *Broadcasting* magazine.

**Table 2 Commercial Radio Network
Affiliates: 1927-1977**

Figures in the next three tables show growth of radio networks over a 50-year period, with all figures as of January 1 of each year. In Table A, NBC figures include both Red and Blue networks until 1942 when Blue was broken

off, becoming independently owned (ABC) a year later. Total percentage of network stations is only approximate, as many stations were affiliated with more than one network at a time. In 1968 ABC broke into four specialized networks (see table 2-C). All percentage columns refer to all commercial stations, not just network affiliates.

A / Commercial Radio Networks: 1927-1977

Year	NBC		CBS		Mutual		ABC		Total Stations	Network Stations	
	Num-ber	Per-centage	Num-ber	Per-centage	Num-ber	Per-centage	Num-ber	Per-centage		Num-ber	Per-centage
1927	28	4.1%	16	2.3%					681	44	6%
1928	52	7.6	17	2.5					677	69	10
1929	58	9.6	49	8.1					606	107	18
1930	71	11.5	60	9.7					618	131	21
1931	75	12.3	76	12.4					612	159	26
1932	86	14.2	84	13.9					604	170	28
1933	88	14.7	91	15.2					599	179	30
1934	88	15.1	92	15.8	4	.7%			583	184	32
1935	88	15.0	97	16.6	3	.5			585	188	32
1936	89	14.4	98	15.9	39	6.3			616	226	37
1937	111	17.2	105	16.3	80	12.4			646	296	46
1938	142	20.6	110	16.0	107	15.5			689	359	52
1939	167	23.1	113	15.7	116	16.1			722	396	55
1940	182	23.8	112	14.6	160	20.9			765	454	59
1941	225	27.1	118	14.2	166	20.0			831	509	61
1942	136	15.3	115	13.0	191	21.5	116	13.1%	887	558	63
1943	142	15.6	116	12.7	219	24.1	143	15.7	910	620	68
1944	143	15.7	133	14.6	245	26.9	173	19.0	910	694	76
1945	150	16.3	145	15.8	384	41.8	195	21.2	919	874	95
1946	155	16.4	147	15.5	384	40.5	195	20.6	948	881	93
1947	161	15.2	157	14.8	488	46.0	222	20.9	1,062	1,028	97
1948	167	10.3	162	10.0	519	32.0	256	15.8	1,621	1,104	68
1949	170	8.9	167	8.7	526	27.5	269	14.1	1,912	1,132	59
1950	172	8.2	173	8.3	543	26.0	282	13.5	2,086	1,170	56
1951	180	8.1	183	8.2	552	24.7	295	13.2	2,232	1,210	54
1952	191	8.2	194	8.3	560	24.0	302	13.0	2,331	1,247	53

Until the late 1960s, virtually all affiliates were AM stations. After ABC split into four networks in 1968 (see table 2—C), an increasing number of FM stations held affiliations with ABC, Mutual and the other radio networks. Thus, since only AM stations are

listed in the “total stations” column, the column showing “percentage of network stations” is misleading (higher than actual), since for the past decade or so a difficult—to—determine number of FM stations have been network affiliates.

Year	NBC		CBS		Mutual		ABC		Total Stations	Network Stations	
	Num-ber	Per-centage	Num-ber	Per-centage	Num-ber	Per-centage	Num-ber	Per-centage		Num-ber	Per-centage
1953	207	8.7%	203	8.5%	560	23.4%	348	14.6%	2,391	1,318	55%
1954	212	8.4	205	8.1	560	22.2	360	14.3	2,521	1,337	53
1955	208	7.8	207	7.8	563	21.1	357	13.4	2,669	1,335	50
1956	205	7.3	204	7.2	558	19.8	342	12.1	2,824	1,309	46
1957	199	6.6	201	6.7	525	17.5	334	11.1	3,008	1,259	42
1958	203	6.4	200	6.3	431	13.5	299	9.4	3,195	1,133	35
1959	209	6.3	198	6.0	441	13.3	286	8.6	3,326	1,134	34
1960	202	5.8	198	5.7	443	12.8	310	9.0	3,456	1,153	33
1961	201	5.7	195	5.5	428	12.1	339	9.6	3,547	1,163	33
1962	200	5.4	206	5.6	510	13.8	342	9.3	3,618	1,258	35
1963	200	5.4	207	5.6	510	13.9	366	10.0	3,760	1,283	34
1964	202	5.2	227	5.8	500	12.8	353	9.1	3,854	1,282	33
1965	209	5.2	237	5.9	501	12.5	355	8.9	4,044	1,302	32
1966	215	5.3	239	5.9	520	12.8	361	8.9	4,065	1,275	31
1967	216	5.2	240	5.8	na	na	337	8.1	4,121	na	na
1968	217	5.1	243	5.7	515	12.1	500	11.8	4,190	1,475	35
1969	222	5.2	245	5.7	492	11.4	1,013	23.6	4,265	1,972	46
1970	220	5.1	247	5.7	523	12.0	1,175	27.0	4,292	2,165	50
1971	230	5.2	249	5.7	538	12.3	1,074	24.5	4,343	2,091	48
1972	231	5.2	242	5.5	545	12.4	1,169	26.5	4,374	2,187	50
1973	233	5.3	243	5.5	568	12.8	1,246	28.1	4,395	2,290	52
1974	230	5.2	248	5.6	632	14.3	1,293	29.2	4,407	2,403	55
1975	232	5.2	247	5.6	657	14.8	1,322	29.8	4,432	2,458	55
1976	223	5.0	257	5.8	684	15.3	1,353	30.3	4,463	2,517	56
1977	236	5.2	266	5.9	755	16.8	1,546	34.4	4,497	2,803	62

Sources: For total number of stations: FCC. For number of their affiliates: the radio networks. For Mutual affiliates 1941–1944: *Broadcasting Yearbook*. For percentage data to 1940: Maclaurin (1949), page 117. Also FCC Report on Chain Broadcasting (1941).

**B / NBC Red and Blue Radio Networks:
1927–1941**

Year	Red (WEAF)	Blue (WJZ)	Alternates
1927	22	6	na
1928	17	11	24
1929	22	14	22
1930	22	17	32
1931	23	18	34
1932	28	22	36
1933	28	24	36
1934	28	20	40
1935	27	20	41
1936	26	18	45
1937	30	33	48
1938	36	44	62
1939	48	55	64
1940	53	60	69
1941	74	92	59

Source: NBC.

C / ABC Radio Networks: 1968–1977

Year	Entertainment	Contemporary	Information	FM
1968	132	76	200	92
1969	251	224	362	176
1970	298	262	425	190
1971	275	242	348	209
1972	306	276	387	200
1973	322	300	414	210
1974	347	319	412	215
1975	365	329	419	209
1976	382	334	442	195
1977	423	372	557	194

Source: ABC.

**Table 3 Commercial Television
Network Affiliates: 1947-1977**

Figures show growth of television networks over a 30-year period, with all data as of January 1 of each year. Because the Dumont network left the air in October 1955, and

as most of its affiliates held a primary affiliation with another network, its figures are presented in the footnote. Through the 1950s, the separate network affiliation listings may not add to the number of network stations shown: multiple affiliations were more common in the days of fewer television outlets per market.

Year	NBC		CBS		ABC		Total Stations	Network Stations	
	Number	Percentage	Number	Percentage	Number	Percentage		Number	Percentage
1947	2	16.7%	1	8.3%	1	8.3%	12	4	33%
1948	9	56.3	3	18.8	6	37.5	16	17	100
1949	25	49.0	15	29.4	11	21.6	51	50	98
1950	56	57.1	27	27.6	13	13.3	98	96	98
1951	63	58.9	30	28.0	14	13.1	107	107	100
1952	64	59.3	31	28.7	15	13.9	108	108	100
1953	71	56.3	33	26.2	24	19.0	126	125	99
1954	164	46.3	113	31.9	40	11.3	354	317	90
1955	189	46.0	139	33.8	46	11.2	411	374	91
1956	200	45.4	168	38.1	53	12.0	441	421	95
1957	205	43.5	180	38.2	60	12.7	471	445	94
1958	209	42.2	191	38.8	69	13.9	495	469	95
1959	213	41.8	193	37.8	79	15.5	510	485	95
1960	214	41.6	195	37.9	87	16.9	515	496	96
1961	201	38.1	198	37.6	104	19.7	527	503	95
1962	201	37.2	194	35.9	113	20.9	541	508	94
1963	203	36.4	194	34.8	117	21.0	557	514	92
1964	212	37.6	191	33.9	123	21.8	564	526	93
1965	198	34.8	190	33.4	128	22.5	569	516	91
1966	202	34.5	193	33.0	137	23.4	585	532	91
1967	205	33.6	191	31.3	141	23.1	610	537	88
1968	207	32.6	192	30.2	148	23.3	635	547	86
1969	211	31.9	190	28.7	156	23.6	662	557	84
1970	215	31.8	193	28.5	160	23.6	677	568	84
1971	218	32.0	207	30.4	168	24.6	682	593	87
1972	218	31.5	209	30.2	172	24.8	693	599	86
1973	218	31.3	210	30.1	176	25.3	697	604	87
1974	218	31.3	212	30.4	181	26.0	697	611	88
1975	219	30.8	213	30.0	185	26.0	711	617	87
1976	218	30.7	213	30.0	182	25.6	710	613	86
1977	212	29.1	210	28.8	190	26.1	728	612	84

Note: Figures above do not include Dumont network as most affiliations were secondary or tertiary after prime affiliation with one of networks above. Dumont figures (from *Broadcasting Yearbook*) were: 1949 (45), 1950 (52), 1951 (62), 1952 (62), 1953 (133), 1954 (195), 1955 (158). Dumont suspended network operations late in 1955. In early 1967, the United (Overmyer) Network broadcast an evening program to 106 stations. All percentages are based on total number of stations.

Sources: For total number of stations: FCC. For number of their affiliates: the television networks.

**Table 4 Radio Advertising:
1927-1977**

Figures show amount of advertising revenue accruing to national radio networks (including program, talent, time, commercial,

and agency commission costs), national and regional spot (including commissions), and local advertising (including discounts and agency commissions). Discounts are excluded for networks and spots. Last column is radio percentage of all advertising expenditure. Dollar figures are in millions; add 000,000.

Year	Network		National Spot		Local		Total Dollars	Percentage of All Advertising
	Dollars	Percentage	Dollars	Percentage	Dollars	Percentage		
1927	\$ 3.8	79.0%	\$.9			19.0%	\$ 4.8	na
1928	10.3	73.0	3.9		28.0		14.1	na
1929	19.2	72.0	7.6		28.0		26.8	na
1930	27.7	68.0	12.8		32.0		40.5	2%
1931	37.5	67.0	18.5		33.0		56.0	3
1932	39.1	63.0	22.8		37.0		61.9	5
1933	31.5	55.0	25.5		45.0		57.0	5
1934	42.6	59.0	30.0		41.0		72.8	6
1935	62.6	55.6	\$ 14.9	13.2%	\$ 35.1	31.2%	112.6	7
1936	75.6	61.8	22.7	18.6	24.0	19.6	122.3	7
1937	88.5	53.8	28.0	17.0	48.1	29.2	164.6	8
1938	89.2	53.4	34.0	20.3	43.9	26.3	167.1	9
1939	98.6	53.6	35.0	19.0	50.2	27.3	183.8	9
1940	113.3	52.6	42.1	19.5	60.2	27.9	215.6	10
1941	125.4	50.7	52.3	21.2	69.5	28.1	247.2	11
1942	128.7	49.5	58.8	22.6	72.5	27.9	260.0	12
1943	156.5	49.9	70.9	22.6	86.2	27.5	313.6	13
1944	191.8	48.7	87.4	22.2	114.3	29.0	393.5	14
1945	197.9	46.7	91.8	21.7	134.2	31.7	423.9	15
1946	199.6	43.9	98.2	21.6	156.6	34.5	454.4	14
1947	201.2	39.7	106.4	21.0	198.8	39.3	506.4	12
1948	210.6	37.5	121.6	21.7	229.9	40.9	561.6	12
1949	203.0	35.5	123.4	21.6	245.0	42.9	571.4	11
1950	196.3	32.4	135.8	22.4	273.3	45.1	605.4	11
1951	179.5	29.6	138.3	22.8	288.5	47.6	606.3	10
1952	161.5	25.9	141.5	22.7	321.1	51.5	624.1	9
1953	141.2	23.1	145.6	23.8	324.4	53.1	611.2	8
1954	114.4	20.5	134.9	24.1	309.4	55.4	558.7	7

Year	Network		National Spot		Local		Total Dollars	Percentage of All Advertising
	Dollars	Percentage	Dollars	Percentage	Dollars	Percentage		
1955	84.4	15.5	134.1	24.6	326.4	59.9	544.9	6
1956	60.5	10.7	161.0	28.4	345.5	60.9	567.0	6
1957	63.5	10.3	186.9	30.2	367.5	59.5	617.9	6
1958	57.8	9.3	189.7	30.6	371.7	60.0	619.2	6
1959	44.1	6.7	206.4	31.4	405.8	61.8	656.3	6
1960	43.1	6.2	221.6	32.0	427.7	61.8	692.4	6
1961	42.8	6.3	220.0	32.2	420.0	61.5	682.8	6
1962	45.8	6.2	233.0	31.7	457.0	62.1	735.8	6
1963	56.4	7.1	243.0	30.8	490.0	62.1	789.4	6
1964	59.1	7.0	256.0	30.3	531.0	62.8	846.1	6
1965	60.0	6.5	275.0	30.0	582.0	63.5	917.0	6
1966	63.5	6.3	308.0	30.5	638.5	63.2	1,010.0	6
1967	64.0	6.1	313.5	29.9	670.5	64.0	1,048.0	6
1968	63.0	5.3	360.0	30.3	767.0	64.5	1,190.0	7
1969	59.0	4.6	368.0	29.1	837.0	66.2	1,264.0	7
1970	56.0	4.3	371.0	28.4	881.0	67.4	1,308.0	7
1971	63.0	4.4	395.0	27.3	987.0	68.3	1,445.0	7
1972	74.0	4.6	402.0	24.9	1,136.0	70.5	1,612.0	7
1973	68.0	3.9	400.0	23.2	1,255.0	72.8	1,723.0	7
1974	69.0	3.8	405.0	22.0	1,363.0	74.2	1,837.0	7
1975	83.0	4.2	436.0	22.0	1,461.0	73.8	1,980.0	7
1976	104.0	4.6	493.0	21.7	1,680.0	73.8	2,277.0	7
1977	114.0	4.7	535.0	21.8	1,800.0	73.5	2,449.0	7

Note: Readers should be aware that ".0" has been added to parts of this table for typographical consistency—on percentages from 1927 through 1934, and on dollar figures from 1961 through 1977.

Sources: Research Department, McCann-Erickson (data reprinted in several sources including *Television Factbook* and Blair's *Statistical Trends in Broadcasting*, both annuals), for data since 1935. Earlier information refers to estimated gross radio billings (and is thus not directly comparable to the post-1935 data) and comes from *Broadcasting Yearbook 1951*, p. 12, table V. These represent advertising volume at the one-time rate, ignoring discounts. McCann-Erickson has provided rounded and corrected data for several earlier years.

**Table 5 Television Advertising:
1949-1977**

Figures show amount of advertising revenue accruing to national television networks (including program, talent, time, commercial and agency commission costs), national

and regional spot advertising (including commissions), and local advertising (including discounts and agency commissions). Discounts are excluded for networks and spots. Last column is television percentage of all advertising expenditure. Dollar figures are in millions; add 000,000.

Year	Network		Nat.-Reg. Spot		Local		Total Dollars	Percentage of All Advertising
	Dollars	Percentage	Dollars	Percentage	Dollars	Percentage		
1949	\$ 29.4	50.9%	\$ 9.2	15.9%	\$ 19.2	33.2%	\$ 57.8	1%
1950	85.0	49.8	30.8	18.0	55.0	32.2	170.8	3
1951	180.8	54.4	69.9	21.0	81.6	24.6	332.3	5
1952	256.4	56.5	93.8	20.7	103.7	22.8	453.9	6
1953	319.9	52.8	145.5	24.0	140.7	23.2	606.1	8
1954	422.2	52.2	206.8	25.6	180.2	22.3	809.2	10
1955	550.2	53.1	260.4	25.2	224.7	21.7	1,035.3	11
1956	643.1	52.5	329.0	26.9	252.6	20.6	1,224.7	12
1957	690.1	53.7	351.6	27.4	243.6	19.0	1,285.3	12
1958	742.0	53.5	397.0	28.6	248.4	17.9	1,387.4	13
1959	776.0	50.7	486.4	31.8	266.8	17.4	1,529.2	13
1960	820.0	50.4	526.7	32.4	280.5	17.2	1,627.3	13
1961	887.3	52.5	548.0	32.4	256.0	15.1	1,691.0	14
1962	976.0	51.4	629.0	33.2	292.0	15.4	1,897.0	15
1963	1,025.0	50.4	698.0	34.4	309.0	15.2	2,032.0	16
1964	1,132.0	49.5	806.0	35.2	351.0	15.3	2,289.0	16
1965	1,237.0	49.2	892.0	35.5	386.0	15.3	2,515.0	17
1966	1,393.0	49.3	988.0	35.0	442.0	15.7	2,823.0	17
1967	1,455.0	50.0	988.0	34.0	466.0	16.0	2,909.0	17
1968	1,523.0	47.1	1,131.0	35.0	577.0	17.9	3,231.0	18
1969	1,678.0	46.8	1,253.0	35.0	654.0	18.2	3,585.0	19
1970	1,658.0	46.1	1,234.0	34.3	704.0	19.6	3,596.0	18
1971	1,593.0	45.1	1,145.0	32.4	796.0	22.5	3,534.0	17
1972	1,804.0	44.1	1,318.0	32.2	969.0	23.7	4,091.0	18
1973	1,968.0	44.1	1,377.0	30.9	1,115.0	25.0	4,460.0	18
1974	2,145.0	44.2	1,497.0	30.8	1,212.0	25.0	4,854.0	18
1975	2,306.0	43.8	1,623.0	30.8	1,334.0	25.3	5,263.0	19
1976	2,857.0	43.1	2,125.0	32.1	1,640.0	24.8	6,622.0	20
1977	3,315.0	44.2	2,360.0	31.5	1,825.0	24.3	7,500.0	20

Note: Readers should be aware that ".0" has been added to parts of this table for typographical consistency, particularly for dollar figures for the years from 1961 through 1977.

Source: Research Department, McCann-Erickson (data reprinted in several sources including *Television Factbook* and Blair's *Statistical Trends in Broadcasting*, both annuals). Data for 1976 are preliminary McCann-Erickson figures, and 1977 is an estimate by Blair. McCann-Erickson has provided rounded and corrected data for several earlier years.

**Table 6 Network Radio Programming:
1927–1956**

The following four tables, based on data in Summers (1958), show trends in programming on the national radio networks from their inception through the mid-1950s, when television had drastically changed the role of network radio. Data for 1927 refer only to NBC's Red network, while data after that year include NBC-Blue and CBS and after 1934 include Mutual. NBC-Blue became independent in 1943 and was renamed ABC in 1945.

The figures shown are the number of quarter-hours of that program type on the air for all networks for a single week—typically, the third week in January. Thus the data are indicative of that “season's” programming but are no more than that, especially as the “season” concept did not become important for the networks until well into the 1930s.

The tables cover (A) evening programs, or those on the air after 6 P.M., any day of the week, (B) weekday daytime programs on the air Monday through Friday before 6 P.M., (C) a total program summary combining the data in A and B plus weekend daytime

figures, and (D) a percentage summary for selected years showing trends in program types. For convenience, the programs in the first three tables are divided into four major categories: variety, music, drama, and talk. Each is further subdivided into specific program types. Note the following in the set of tables:

Other than children's variety, programs directed at children are included in totals with adult programs.

Recorded music and magazine variety, to name the two most obvious types, do not appear in network schedules until the 1950s.

Under *drama*, “general” refers to anthology and prestige dramatic programs, while “light” is a catchall for series not covered in other categories.

Under *talk*, “human interest” means a program type concentrating on personalities and occupations and activities, though the nominal format of such programs was often audience-participation, panel, or quiz show in style.

Under *music*, all the programs shown were live except those labeled “recorded.”

Note: Tables 6 (A–D) are copyrighted by L. W. Lichty and are used with permission.

A / Evening Network Radio Programs: 1927–1956
(number of quarter-hours on commercial networks)

	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
Variety												
Vaudeville and Comedy	—	4	6	12	9	5	28	32	30	28	38	36
Semi-Variety	—	—	—	8	18	37	8	23	18	16	16	6
Amateur and Talent	—	—	—	—	—	—	—	—	2	9	4	4
Hillbilly, Country & Western	—	—	2	2	—	2	7	9	10	20	10	8
General and Talk Variety	4	10	12	10	16	12	14	14	23	22	24	30
Children's Variety	—	—	—	—	—	—	—	—	—	3	—	—
Magazine Variety	—	—	—	—	—	—	—	—	—	—	—	—
Music												
Musical Variety	30	34	55	90	75	87	57	64	99	70	56	52
Light Music	8	28	34	46	37	60	44	27	29	34	25	20
Concert Music	39	76	68	62	62	33	44	48	47	49	36	48
Recorded Music	—	—	—	—	—	—	—	—	—	—	—	—
Drama												
General	—	—	—	—	—	—	—	2	2	6	8	6
Light	—	8	16	22	20	13	15	13	18	17	11	17
Women's Serial	—	—	—	—	—	16	15	15	13	5	—	—
Comedy, Comedy Situation	—	—	—	11	18	17	16	8	10	22	34	16
Thriller	—	—	2	6	9	19	38	34	35	22	25	23
Documentary, Information	—	4	—	2	—	3	4	4	4	7	8	12
Talk												
Human Interest	—	—	—	—	—	—	—	6	7	5	16	16
Quiz	—	—	—	—	—	—	—	—	—	—	6	8
News	1	4	2	4	13	12	19	27	28	31	34	23
Public Affairs, Forums	—	2	2	5	5	8	7	—	12	5	8	8
Talk	4	4	2	4	14	12	13	14	15	26	14	18
Sports Play-by-Play	—	—	—	—	—	—	—	—	—	—	—	2
Religion	2	2	2	4	14	4	2	5	5	5	5	5
Total Quarter-Hours	88	176	203	288	310	340	331	345	407	402	378	358

1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
38	32	18	32	34	38	32	30	38	34	30	24	22	26	18	6	8	12
6	16	6	9	2	5	2	—	4	2	2	4	4	4	2	2	10	10
4	4	4	4	2	2	2	—	—	4	8	7	7	9	6	2	2	2
12	12	8	8	6	8	10	4	6	4	10	4	4	4	12	12	11	5
32	16	28	24	21	29	22	22	18	4	4	8	4	4	2	8	25	7
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	30
48	59	58	69	60	63	70	63	40	44	52	51	33	29	56	52	76	51
12	24	4	11	7	5	13	9	3	4	2	7	6	15	23	26	28	37
28	28	34	37	22	29	29	24	18	22	23	21	26	32	30	38	27	24
—	4	—	—	—	—	—	—	—	—	—	—	—	10	12	10	4	15
14	14	14	16	12	16	8	18	16	18	20	14	20	16	16	12	6	—
28	24	20	17	14	11	8	17	19	12	22	12	9	25	15	22	7	5
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18	21	17	27	20	23	32	40	44	41	35	53	39	33	36	41	16	13
33	40	30	41	35	56	48	57	79	78	68	91	95	91	79	71	62	37
8	4	4	9	12	16	16	6	6	10	4	2	12	9	10	11	6	18
13	10	19	12	10	16	9	11	12	12	8	10	12	6	—	6	2	9
18	30	37	28	30	30	32	38	27	36	48	34	32	16	36	25	19	12
33	56	45	62	65	88	73	77	49	65	50	77	82	83	96	103	82	85
12	13	18	14	12	11	10	14	17	9	13	13	12	10	12	17	17	23
23	38	23	26	8	5	9	21	23	14	22	19	19	18	25	32	21	27
2	3	3	2	—	—	2	3	3	3	3	5	6	6	3	3	26	—
7	5	9	7	11	9	5	5	5	5	3	7	—	—	—	2	10	10
389	453	399	455	383	460	432	459	427	421	427	463	444	446	489	501	465	432

B / Weekday Daytime Network Radio Programs: 1927–1956
(number of quarter-hours on commercial networks)

	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
Variety												
Vaudeville and Comedy	—	—	—	—	—	—	2	—	5	4	—	—
Semi-Variety	—	—	—	—	—	—	—	—	—	—	—	—
Amateur and Talent	—	—	—	—	—	—	—	—	—	—	—	—
Hillbilly, Country & Western	—	—	—	—	—	—	—	—	—	—	—	—
General and Talk Variety	—	—	—	—	—	—	—	20	27	20	30	40
Children's Variety	—	—	—	11	8	15	25	—	12	10	7	4
Magazine Variety	—	—	—	—	—	—	—	—	—	—	—	—
Music												
Musical Variety	—	—	—	2	—	9	5	—	6	—	8	—
Light Music	—	10	27	18	30	62	54	92	49	87	45	42
Concert Music	—	—	4	8	4	6	9	20	16	13	18	16
Recorded Music	—	—	—	—	—	—	—	—	—	—	—	—
Drama												
General	—	—	—	4	4	4	8	8	4	4	4	4
Light	—	—	—	—	—	2	4	—	—	—	5	—
Women's Serial	—	—	—	—	—	—	20	43	48	88	154	240
Comedy, Situation Comedy	—	—	—	—	—	6	5	9	15	—	5	7
Thriller	—	—	—	—	—	5	14	13	18	25	27	41
Documentary, Information	—	—	1	—	10	10	10	10	12	10	12	10
Talk												
Human Interest	—	—	—	—	—	—	—	5	5	16	12	17
Quiz	—	—	—	—	—	—	—	—	—	—	—	—
News	—	—	—	—	—	—	6	—	—	10	29	18
Public Affairs, Forums	—	—	—	—	—	—	—	—	—	—	—	1
Talk	3	31	89	51	96	134	79	91	80	70	83	88
Sports Play-by-Play	—	—	—	—	—	—	—	—	—	—	—	—
Religion	—	—	—	—	—	—	—	—	—	—	—	5
Total Quarter-Hours	3	41	121	94	152	253	241	311	297	357	439	533

1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
—	—	—	—	—	—	—	10	—	—	—	—	—	—	10	5	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	10	10	10	—	—	—
—	—	—	2	—	2	10	—	35	30	30	35	35	15	24	19	—	—
40	42	40	32	62	70	30	55	40	30	55	80	95	65	110	101	121	126
3	4	5	—	—	—	—	—	—	—	—	—	10	5	14	5	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	95
—	—	—	4	5	9	—	10	10	10	20	30	25	10	15	20	41	48
65	46	38	35	4	13	30	29	24	6	21	16	15	25	53	43	23	23
16	10	11	14	2	4	—	—	—	—	2	2	—	—	—	5	5	5
—	—	—	—	—	—	—	—	—	40	15	20	10	30	25	36	28	35
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3	—	—	—	—	15	14	14	9	13	15	20	20	10	15	28	33	23
225	305	300	275	200	220	195	200	165	180	165	160	135	175	140	135	130	95
—	5	5	5	—	5	5	10	10	10	10	—	—	—	—	5	—	5
30	20	26	35	25	30	40	50	45	45	40	42	35	35	15	12	12	8
20	19	10	10	10	10	10	10	10	10	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6	4	—	—	—	10	30	45	58	70	85	70	50	50	44	53	35	28
—	—	5	5	—	15	15	15	41	50	50	31	50	60	45	35	35	13
—	10	20	41	49	50	50	51	50	50	35	35	40	30	51	73	63	55
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
75	68	68	76	33	37	42	44	37	36	54	45	55	40	48	15	18	25
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5	5	—	—	—	—	—	5	—	—	5	5	5	5	5	5	—	—
488	538	528	534	390	490	471	548	534	580	602	591	590	565	624	595	544	584

C / Network Radio Programs: Summary 1927-1956
(number of quarter-hours on commercial networks)

	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
Evening												
Variety	4	14	20	32	43	56	57	78	83	98	92	84
Music	77	138	157	198	174	180	145	139	175	153	117	120
Drama	—	12	18	41	47	68	88	76	82	79	86	74
Talk	7	12	8	17	46	36	41	52	67	72	83	80
Daytime												
Variety	—	—	—	11	8	15	27	20	44	30	37	44
Music	—	10	31	28	34	77	68	112	71	100	71	58
Drama	—	—	1	4	14	27	61	83	97	127	207	302
Talk	3	31	89	51	96	134	85	96	85	96	124	129
Weekend Daytime												
Variety	—	—	—	—	—	4	6	10	8	8	10	12
Music	—	2	10	14	27	56	55	66	58	62	65	55
Drama	—	—	2	2	2	15	12	19	16	7	16	11
Talk	16	22	15	21	25	26	24	22	23	35	38	36
Total by Type												
Variety	4	14	20	43	51	75	90	108	135	136	139	140
Music	77	150	198	240	235	313	268	317	304	315	253	233
Drama	—	12	21	47	63	110	161	178	195	213	309	387
Talk	26	65	112	89	167	196	150	170	175	203	245	245
Total Quarter-Hours	107	241	351	419	516	694	669	773	809	867	946	1,005

1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
92	80	64	77	65	82	68	56	66	48	54	47	41	47	40	30	56	66
88	115	96	117	89	97	112	96	61	70	77	79	65	86	121	126	135	127
101	103	85	110	93	122	112	138	164	159	149	172	175	174	156	157	97	73
108	155	154	151	136	159	140	169	136	144	147	165	163	139	172	188	177	166
43	46	45	34	62	72	40	65	75	60	85	115	150	95	168	130	121	221
81	56	49	53	11	26	30	39	34	56	58	68	50	65	93	104	97	111
278	349	341	325	235	280	264	284	239	258	230	222	190	220	170	180	175	131
86	87	93	122	82	112	137	160	186	206	229	186	200	185	193	181	151	121
24	16	12	15	14	30	18	20	12	10	12	14	22	24	23	58	66	90
56	63	64	66	51	60	43	69	63	53	47	47	50	52	108	83	78	80
18	16	17	18	14	36	30	34	39	39	35	39	38	36	36	27	22	16
35	53	58	65	50	62	60	70	69	58	77	79	90	77	107	99	92	92
159	142	121	126	141	184	126	141	153	118	151	176	213	166	231	218	243	377
225	234	209	236	151	183	185	204	158	179	182	194	165	203	322	313	310	318
397	468	443	453	342	438	406	456	442	456	414	433	403	430	362	364	294	220
229	295	305	338	268	333	337	399	391	408	453	430	453	401	472	468	420	379
1,010	1,139	1,078	1,153	902	1,138	1,054	1,200	1,144	1,161	1,200	1,233	1,234	1,200	1,387	1,363	1,267	1,294

D / Network Radio Programs:
Percentages 1929-1956 (every three years)

Year	Percentage of all Quarter-Hours:						Total Quarter-Hours Broadcast per Week
	Variety	Musical	Drama	Interview, Human Interest, Quiz	News, Sports, Forums, Talks	Other*	
1929	5%	56%	6%	—	28%	5%	351
1932	11	46	15	—	26	2	694
1935	18	39	25	2%	11	5	809
1938	15	24	38	4	16	3	1,005
1941	10	20	42	6	18	4	1,078
1944	16	16	38	7	19	4	1,138
1947	14	15	33	14	21	3	1,144
1950	13	15	36	13	19	4	1,233
1953	15	25	28	8	20	10	1,387
1956	31	23	16	5	19	6	1,294

*Includes Farm, Religious, Miscellaneous, and Unclassified.

Data in this table derived from tables 6(A-C).

**Table 7 Network Television Programming:
1949–1973**

The following tables show trends in programs on the national commercial television networks from their inception in 1948–1949 through 1973.

As in tables 6 (A–D), the figures show the number of quarter-hours of that program type on the air for all networks for a single week—typically, the third week in January. The data are thus indicative of that television season; that is, 1954 data refer in a general sense to the 1953–1954 television season.

The tables show (A) evening programs on the air after 6 P.M., (B) weekday daytime programs on the air Monday through Friday before 6 P.M., and (C) a total programming summary, number of quarter-hours and percentages combining the information in A and B with that for weekend daytime programming

and also including cost and other measures of program change.

The program types for the television tables are more refined than those for radio, thus making direct comparisons a bit difficult. For example, “thriller” in the radio tables includes crime-detective, action-adventure, westerns, and suspense programs in television. Note also:

Children’s programs are grouped together under a single category, “other types.”

Under *music*, “light music” indicates a program of singing or instrumental music only, typically a 15-minute filler program used in television’s early years but seldom since.

Under *drama*, “general” includes anthology and prestige dramatic presentations primarily, but also a few programs not readily classified in the other categories shown.

Note: Tables 7(A–C) are copyrighted by L. W. Lichy and are used with permission.

A / Evening Network Television Programs: 1949–1973
(number of quarter-hours on commercial networks)

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Variety										
Special, Varied Forms	—	—	—	2	—	—	22	32	22	10
Comedy	42	40	86	65	50	43	44	42	39	20
Amateur, Talent	8	10	18	14	10	10	6	8	10	6
Country and Western	6	—	—	—	—	—	4	8	4	4
General, Talk	—	—	34	—	—	—	30	30	20	35
Music										
Musical Variety	15	22	27	26	8	12	8	15	26	40
Light Music	15	12	25	13	12	12	14	6	4	—
Drama										
General	24	42	64	54	44	58	80	70	76	30
Motion Pictures	34	8	12	—	—	—	—	12	10	—
Women's Serials	3	2	2	2	—	—	—	—	—	—
Action-Adventure	—	8	6	11	10	4	6	16	22	16
Crime-Detective	2	12	16	28	22	18	12	8	6	18
Suspense	—	8	16	18	8	10	4	2	6	6
Westerns	—	2	10	6	7	6	6	16	16	40
Comedy, Situation Comedy	4	15	16	24	36	50	60	38	36	40
Animated Cartoons	—	2	—	—	—	—	—	—	—	—
Quiz and Panel										
Audience Participation	10	18	22	18	18	24	18	24	26	22
Human Interest	10	14	13	16	12	15	10	8	6	10
Panel Shows	13	10	20	26	24	22	16	10	6	6
News and Information										
Newscasts	27	14	13	13	19	18	22	16	16	21
Forums, Interviews	14	12	8	14	19	11	5	2	2	—
Documentary, Information	4	4	4	2	4	8	10	10	12	12
Other Types										
Religion	—	2	4	4	7	3	2	2	2	—
Talk	30	6	3	10	11	10	5	5	1	—
Children's Shows	29	63	40	21	10	5	10	5	5	4
Sports	62	52	82	33	31	34	29	13	6	6
Miscellany	10	8	5	7	11	—	—	—	—	—
Total Quarter-Hours	362	386	546	427	373	373	423	398	379	346

1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
10	22	4	8	8	4	4	4	4	4	4	4	4	8	19
14	22	14	14	28	40	40	24	28	33	34	35	34	20	20
4	—	—	—	—	—	4	4	—	—	—	—	—	—	—
4	4	—	—	—	4	4	4	—	—	—	8	8	—	—
45	35	35	39	40	39	81	42	42	66	66	96	96	96	51
36	22	18	20	30	28	28	26	16	22	28	24	20	8	12
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35	32	28	34	54	60	34	18	8	3	10	34	34	20	24
—	—	—	8	16	16	24	32	48	52	56	72	64	72	101
—	—	—	—	—	—	4	6	4	4	4	—	—	—	—
16	24	32	22	26	18	32	54	70	65	28	18	6	8	16
32	48	40	48	20	18	8	12	10	24	40	24	46	48	44
4	6	—	8	8	14	12	—	4	4	4	—	—	4	4
64	70	54	46	36	34	24	34	38	34	38	22	22	16	12
26	32	52	50	48	38	62	72	52	38	42	56	50	40	42
—	—	6	12	6	2	6	2	—	—	2	—	—	—	—
8	6	4	8	4	6	2	—	4	6	6	6	4	—	—
8	6	6	2	2	4	2	2	2	—	—	—	—	—	—
10	12	8	6	8	6	6	6	6	—	—	—	—	—	—
21	16	16	23	23	32	29	30	40	35	27	39	41	39	39
2	2	10	2	2	2	2	—	—	—	—	—	—	—	—
10	8	28	26	22	16	20	12	12	12	16	8	8	6	8
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7	8	6	4	4	6	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
360	375	361	380	385	387	428	384	388	409	419	446	437	385	392

B / Daytime Network Television Programs: 1949–1973
(number of quarter-hours on commercial networks)

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Variety										
Special, Variety	—	—	—	—	—	—	—	—	—	—
Comedy	—	—	—	35	—	—	—	—	—	—
Amateur, Talent	—	—	—	—	—	—	—	—	—	—
Country and Western	—	—	—	—	—	—	—	—	—	—
General, Talk	10	10	13	129	79	86	166	166	114	76
Music										
Musical Variety	5	—	20	20	40	50	30	10	10	55
Light Music	10	5	5	5	—	—	—	—	—	—
Drama										
General	—	—	—	—	—	—	—	20	20	30
Motion Pictures	—	—	—	—	—	—	—	40	30	—
Women's Serials	—	—	5	30	20	45	84	40	55	65
Action-Adventure	20	—	—	—	—	—	—	—	—	10
Crime-Detective	—	—	—	—	—	—	—	—	—	—
Suspense	—	—	—	—	—	—	—	—	—	—
Westerns	—	—	15	—	—	10	—	—	—	—
Comedy, Situation Comedy	—	—	—	—	—	—	—	—	30	10
Animated Cartoons	—	—	—	—	—	—	—	—	—	—
Quiz and Panel										
Audience Participation	20	30	24	28	42	44	40	40	50	80
Human Interest	15	5	8	1	25	25	20	30	35	45
Panel Shows	—	—	10	—	—	—	—	—	5	—
News and Information										
Newscasts	—	—	—	10	5	5	—	—	5	5
Forums, Interviews	—	—	—	—	—	—	—	—	—	—
Documentary, Information	—	—	—	—	—	20	—	—	—	—
Other Types										
Religion	—	5	—	—	—	—	—	—	—	—
Talk	15	90	28	11	—	—	27	—	—	—
Children's Shows	10	40	30	15	21	35	32	70	40	25
Sports	—	—	—	—	—	—	—	—	—	—
Miscellany	—	—	—	—	—	—	—	—	—	—
Total Quarter-Hours	105	185	158	284	232	320	399	416	394	401

1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
70	60	40	50	70	45	40	40	40	40	40	50	50	50	60
50	30	30	20	20	10	10	10	20	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20	50	50	50	40	20	—	20	20	20	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
70	80	100	70	60	70	120	150	110	108	138	158	180	160	160
—	20	20	—	—	—	—	—	—	—	—	—	—	—	—
—	50	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	50	10	10	—	20	20	—	—	—	—	—	—	—	—
10	40	50	20	40	50	60	60	50	50	50	60	60	70	20
—	10	—	—	—	—	—	—	—	—	—	—	—	—	—
140	80	100	140	110	120	100	100	128	128	114	68	70	90	130
40	40	50	30	20	20	10	10	20	20	8	—	—	—	—
—	—	—	10	20	20	10	10	10	18	10	28	20	10	10
5	5	9	22	16	24	24	24	22	18	18	26	24	25	25
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50	20	20	30	40	10	10	10	10	12	12	10	10	10	10
25	15	15	40	20	20	20	20	20	20	20	20	20	20	20
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
480	550	494	492	456	429	424	454	450	434	410	420	434	435	435

C / Network Television Programs: Summary 1949–1973 (every three years)
(number of quarter-hours on commercial networks)

	1949	1952	1955	1958	1961	1964	1967	1970	1973
All Programming: Quarter-Hours									
Variety	66	249	278	161	95	134	116	195	150
Music	45	64	52	99	50	42	40	28	16
Drama	87	196	266	309	468	400	478	518	483
Quiz	68	93	108	167	170	180	174	102	142
News / Information	45	56	60	62	77	94	88	83	94
Other	166	145	157	75	97	88	74	84	86
Total	477	803	921	873	957	938	970	1,010	971
All Programming: Percentage									
Variety	14%	31%	30%	18%	10%	14%	12%	19%	15%
Music	9	8	6	11	5	4	4	3	2
Drama	18	24	29	35	49	43	48	51	50
Quiz	14	12	12	19	18	19	18	10	15
News / Information	9	7	7	7	8	10	9	8	10
Other	35	18	17	9	10	9	8	8	9
Total	99%	100%	101%	99%	100%	99%	99%	99%	101%
Average Production Cost: Prime-Time Programs									
90 min. Drama	na	na	na	na	na	\$181,000	\$200,000	\$300,000	\$342,500
60 min. Variety	\$ 5,900	\$35,900	\$67,700	\$84,000	\$110,000	115,700	182,170	193,210	204,286
60 min. Drama	10,800	21,100	34,100	65,450	86,640	120,810	176,520	203,610	213,636
30 min. Variety	3,800	16,700	24,600	44,100	63,000	65,000	na	100,000	na
30 min. Drama	3,500	13,200	26,100	36,200	42,270	59,030	88,690	103,960	104,194
30 min. Quiz	1,730	9,640	11,400	29,330	28,200	45,500	71,000	35,000	na
Movies	na	na	na	na	180,000	200,000	380,000	750,000	750,000
Movies for TV	na	na	na	na	na	na	na	400,000	418,333
Live-VTR or Film (percentage of quarter-hours in prime time)									
Live-VTR	34%	78%	65%	42%	17%	25%	19%	22%	12%
Film	na	25	40	69	81	54	67	51	58

Source: Lichty and Topping (1975), Table 36, pages 439–440. Information in the last two sections (average production cost and live-VTR or film) is *only* for prime-time programs broadcast 7–11 p.m. Average production cost is actually the lease (rental) payment for all showings (usually two) for “Movies” while referring to production costs for all other categories. The percentage figures for live-VTR and film are based on prime-time quarter-hours—and may not add to 100 percent due to rounding.

Table 8 Ownership of Radio Receivers: 1922–1977

Figures represent a half-century of radio receiver ownership growth. Though radio

production was frozen during World War II (1942–1945), the number of families grew as extra sets were distributed to those with none. As cars were junked during that period, however, car radios in use obviously declined.

Year	Radio Households	Percentage of All Households	Average Receiver Cost	Cars with Radio	Percentage of All Cars
1922	60,000	0.2%	\$50	na	na
1923	400,000	1.5		na	na
1924	1,250,000	4.7		na	na
1925	2,750,000	10.1	83	na	na
1926	4,500,000	16.0		na	na
1927	6,750,000	23.6		na	na
1928	8,000,000	27.5		na	na
1929	10,250,000	34.6		na	na
1930	13,750,000	45.8	78	30,000	.1%
1931	16,700,000	55.2		100,000	.4
1932	18,450,000	60.6		250,000	1.2
1933	19,250,000	62.5		500,000	2.4
1934	20,400,000	65.2		1,250,000	5.8
1935	21,456,000	67.3	55	2,000,000	8.9
1936	22,869,000	68.4		3,500,000	14.5
1937	24,500,000	74.0		5,000,000	19.7
1938	26,667,000	79.2		6,000,000	23.8
1939	27,500,000	79.9		6,500,000	24.9
1940	28,500,000	81.1	38	7,500,000	27.4
1941	29,300,000	81.5		8,750,000	29.6
1942	30,600,000	84.0		9,000,000	32.3
1943	30,800,000	83.6		8,000,000	30.9
1944	32,500,000	87.6		7,000,000	27.5
1945	33,100,000	88.0	40	6,000,000	23.4
1946	33,998,000	89.9		7,000,000	24.9
1947	35,900,000	93.1		9,000,000	29.3
1948	37,623,000	94.2		11,000,000	33.1
1949	39,300,000	94.8		14,000,000	38.6
1950	40,700,000	94.7	26	18,000,000	49.6
1951	41,900,000	95.5		21,000,000	52.3
1952	42,800,000	95.6		23,500,000	55.3
1953	44,800,000	98.2		25,000,000	57.3
1954	45,100,000	96.7		26,100,000	56.4
1955	45,900,000	96.4	20	29,000,000	60.0
1956	46,800,000	96.3		30,100,000	57.9
1957	47,600,000	96.2		35,000,000	64.6
1958	48,500,000	96.3		36,500,000	65.5
1959	49,450,000	96.7		37,200,000	65.7

Table 8 (continued)

Year	Radio Households	Percentage of All Households	Average Receiver Cost	Cars with Radio	Percentage of All Cars
1960	50,193,000	95.6%	\$20	40,387,000	68.1%
1961	50,695,000	95.3		42,616,000	69.5
1962	51,305,000	94.5		46,900,000	74.4
1963	52,300,000	94.9		49,948,000	75.9
1964	54,000,000	96.6		53,308,000	77.7
1965	55,200,000	98.6	10	56,871,000	79.1
1966	57,000,000	98.6		60,000,000	79.9
1967	57,500,000	98.6		64,500,000	83.0
1968	58,500,000	98.6		69,000,000	85.8
1969	60,600,000	98.6		73,500,000	89.3
1970	62,000,000	98.6	11	80,500,000	92.5
1971	62,600,000	98.6		85,400,000	94.8
1972	64,100,000	98.6		91,700,000	95.0
1973	67,400,000	98.6		92,700,000	95.0
1974	68,500,000	98.6		94,500,000	95.0
1975	70,400,000	98.6	na	100,400,000	95.0
1976	71,400,000	98.6		na	na
1977	72,900,000	98.6		na	na

Sources: For radio households: National Association of Broadcasters (to 1950) and RAB (1950 to date). For cars with radio: Electronic Industries Association (to 1954) and Radio Advertising Bureau (1955 to date). Average receiver cost from Lichty and Topping (1975), page 521, table 41. Otto Schairer, in *Patent Policies of Radio Corporation of America* (New York: RCA Institutes Press, 1939, page 57), reports an average retail price for radio receivers of \$120 in 1929 and \$43.60 in 1937.

Table 9 Ownership of Television Receivers: 1946–1977

Year	Television Households	Percentage of All Households	Television Homes			Average Receiver Cost	
			Percentage with Multi-sets	Percentage with UHF	Percentage with Color	B & W	Color
1946	8,000	.02%	—				
1947	14,000	.04	—			\$279	
1948	172,000	.4	1%				
1949	940,000	2.3	1				
1950	3,875,000	9.0	1			190	
1951	10,320,000	23.5	2		na		
1952	15,300,000	34.2	2	na	na		
1953	20,400,000	44.7	3	na	na		
1954	26,000,000	55.7	3	na	na		
1955	30,700,000	64.5	3	na	.02%	138	\$500
1956	34,900,000	71.8	5	na	.05		
1957	38,900,000	78.6	6	9.2%	.2		
1958	41,925,000	83.2	8	8.1	.4		
1959	43,950,000	85.9	10	8.0	.6		
1960	45,750,000	87.1	13	7.0	.7	132	392
1961	47,200,000	88.8	13	7.1	.9	125	381
1962	48,855,000	90.0	14	7.3	1.2	128	352
1963	50,300,000	91.3	16	9.6	1.9	118	346
1964	51,600,000	92.3	19	15.8	3.1	109	348
1965	52,700,000	92.6	22	27.5	5.3	106	356
1966	53,850,000	93.0	25	38.0	9.7	98	371
1967	55,130,000	93.6	28	47.5	16.3	92	362
1968	56,670,000	94.6	29	57.0	24.2	74	336
1969	58,250,000	95.0	33	66.0	32.0	78	328
1970	59,700,000	95.2	34	73.0	39.2	75	317
1971	61,600,000	95.5	36	80.0	45.1	81	324
1972	63,500,000	95.8	38	81.0	52.8	79	319
1973	65,600,000	96.0	41	86.0	60.1	77	308
1974	66,800,000	96.1	42	89.0	67.3	79	316
1975	68,500,000	96.3	43	91.0	70.8	84	341
1976	70,500,000	96.4	45	92.0	73.3	89	349
1977	71,500,000	96.9	47	92.0	76.0	na	na

Sources: NBC Corporate Planning data as reprinted annually in *Television Factbook*, except for UHF penetration data which are from NBC Research, based, in turn, on studies by the Advertising Research Foundation (to 1968) and U.S. Census reports. Average set prices taken from *Television Digest* (17:27:9) for 1960–1976, inclusive, using Electronic Industries Association data. Estimates for earlier years from Lichty and Topping (1975), page 522, table 42, and authors. Column on multiple sets is a compromise by the authors due to extensive disagreement on this statistic between various original sources (which is why figures are rounded to nearest whole number). Through 1963, the figures are those of NBC Research as published in *Television Factbook*—data closely paralleled by other sources. After 1963, the figures are a compromise most closely following data supplied by A. C. Nielsen Co. 1976 television household and color penetration data derived from estimates in Blair's 1977 *Statistical Trends in Broadcasting*. 1977 data supplied by *Television Factbook* staff. Color and UHF data generally from Nielsen fall survey of the previous year.

**Table 10 Growth of Cable Television:
1952-1977**

Data below, for various dates (usually in the fall or January 1) of each year, show estimates of the number of cable systems, total

number of cable subscribers, percentage of television homes with cable, and the average number of subscribers per system. The latter figure may mislead, since even in 1977 only 22 percent of all reporting systems had 3,500 or more subscribers, and only 10 systems had 50,000 or more.

Year	Number of Systems	Number of Subscribers (add 000)	Cable Percentage of TV Homes	Average Number of Subscribers per System
1952	70	14	0.1%	200
1953	150	30	0.2	200
1954	300	65	0.3	217
1955	400	150	0.5	375
1956	450	300	0.9	667
1957	500	350	0.9	700
1958	525	450	1.1	857
1959	560	550	1.3	982
1960	640	650	1.4	1,016
1961	700	725	1.5	1,036
1962	800	850	1.7	1,063
1963	1,000	950	1.9	950
1964	1,200	1,085	2.1	904
1965	1,325	1,275	2.4	962
1966	1,570	1,575	2.9	1,003
1967	1,770	2,100	3.8	1,186
1968	2,000	2,800	4.4	1,400
1969	2,260	3,600	6.1	1,593
1970	2,490	4,500	7.6	1,807
1971	2,639	5,300	8.8	2,008
1972	2,841	6,000	9.6	2,112
1973	2,991	7,300	11.1	2,441
1974	3,158	8,700	13.0	2,755
1975	3,506	9,800	14.3	2,795
1976	3,651	10,800	15.5	2,958
1977	3,800	11,900	17.3	3,132

Source: Original estimates from *Television Factbook* and *Television Digest*.

A Selected
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A Selected
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Index

Note: This index does not include the numerous (usually technical) concepts discussed in the glossary (Appendix B) as the latter is alphabetically organized and the terms are thus easily found there. We have provided birth-death dates for the important technical inventors and innovators listed in the index and have given the dates of office for some political figures and FCC commissioners. Letters following page numbers denote: b - box; p - photograph; t - table.

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