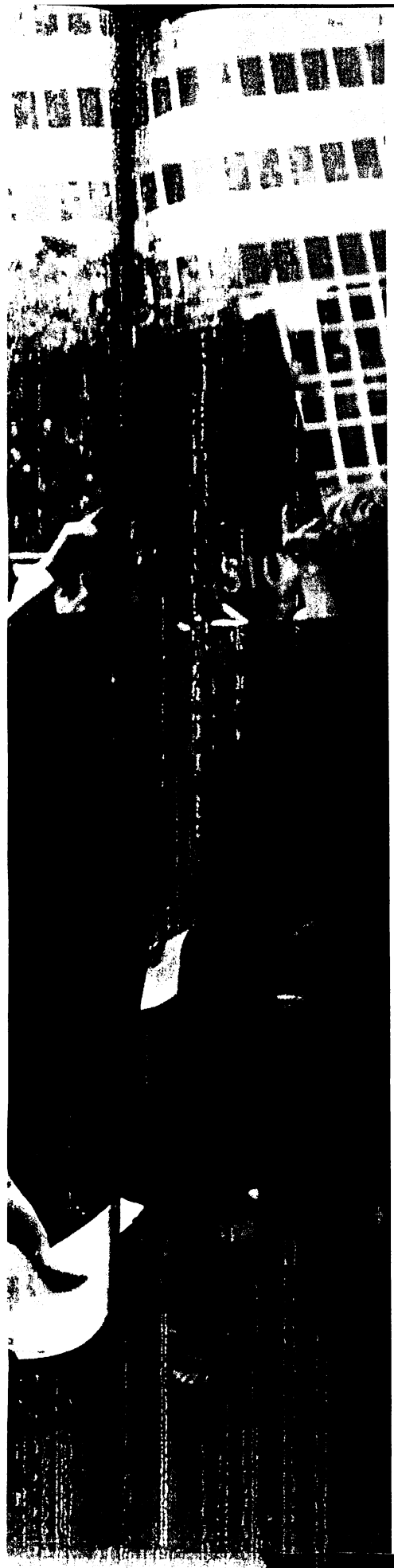

4

Popular Radio and the Origins of Broadcasting

In the early 2000s, Clear Channel Communications was at its high point. Just a few years earlier, in 1995, it owned only 39 radio stations, near the maximum number then allowed by the Federal Communications Commission (FCC). But the Telecommunications Act of 1996 overturned most radio ownership rules, and Clear Channel went on a station-buying spree. By 2000, it owned more than 1,000 stations, and within a few more years, it surpassed 1,200, over three times the number of its nearest competitor. It was also the largest billboard company in the world, the nation's largest live music concert promoter, operator of an athlete management firm, owner of 56 television stations, and an investor in 240 radio stations in other countries.

PROTESTORS rally against Clear Channel's consolidation of radio station ownership in 2003.

The corporate world loved the ever-growing communication behemoth, and *Fortune* magazine lauded Clear Channel's business model of domination by naming it to its list of "America's Most Admired Companies" for several consecutive years. Yet regular radio-listening Americans in places like Atlanta, Chicago, Cincinnati, Denver, Houston, Los Angeles, Phoenix, and Washington, D.C., weren't so admiring of Clear Channel, which owned the majority of their city's major radio stations.

Clear Channel's rise ushered in a new era of homogenized corporate radio, characterized by centralized control and a greater reliance on syndicated radio programming. Citizens and community groups complained about the decline of minority ownership; the lack of musical diversity on the airwaves; the near-disappearance of local radio news; and the replacement of live, local radio deejays with imported or prerecorded announcers.[1] Concerns about Clear Channel inspired a formal grassroots media reform movement in 2002. Citizen pressure forced the FCC to begin public hearings on localism in broadcasting, and more than three million Americans contacted the FCC to oppose further relaxation of media ownership rules.

Ultimately, in its move to make itself into an extraordinary vehicle for advertisers, Clear Channel lost sight of its most precious commodity—listeners—and its duty to operate in the public interest. While Clear Channel was amassing an unprecedented number of radio stations as an advertising vehicle, listeners found homogenized local radio increasingly less relevant to their lives and began migrating to satellite and Internet radio, or their own iPods.

In 2005, just ten years after its meteoric rise began, Clear Channel failed to make *Fortune*'s "Most Admired" list and began to generate revenue by disassembling itself—selling its concert business and its television station group, and offering some of its radio stations for sale. In 2008 it was bought for $24 billion by private equity investors Bain Capital and Thomas H. Lee Partners. Clear Channel, now struggling financially with debt from years of expansion, is still the largest radio station chain in the country, with over 800 stations.

Still, there remains little diversity in radio station ownership these days. A study indicated that women, who comprise 51 percent of the U.S. population, own just 6 percent of full-power commercial broadcast radio stations. Racial minorities, who make up 33 percent of the country's population, own only 7.7 percent of the stations.[2] Diversity in media ownership is crucial to democracy, argues Loris Taylor, executive director of Native Public Media, an advocacy group for the country's thirty-three American Indian-owned public stations. "If you don't have access and ownership and control of a media system, you really don't exist," she says. "You don't matter in terms of being citizens in a democracy who are entitled to the ability to tell, and have a conversation about, your own stories."[3]

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"Clear Channel's rise ushered in a new era of homogenized corporate radio . . ."

◢ *EVEN WITH THE ARRIVAL OF TV IN THE 1950s* and the recent "corporatization" of broadcasting, the historical and contemporary roles played by radio have been immense. From the early days of network radio, which gave us "a national identity" and "a chance to share in a common experience,"[4] to the more customized, demographically segmented medium today, radio's influence continues to reverberate throughout our society. Though television displaced radio as our most common media experience, radio specialized and adapted. The daily music and persistent talk that resonate from radios all over the world continue to play a key role in contemporary culture.

In this chapter, we examine the scientific, cultural, political, and economic factors surrounding radio's development and perseverance. We explore the origins of broadcasting, from the early theories about radio waves to the critical formation of RCA as a national radio monopoly. We then probe the evolution of commercial radio, including the rise of NBC as the first network, the development of CBS, and the establishment of the first federal radio legislation. Reviewing the fascinating ways in which radio reinvented itself in the 1950s, we examine television's impact on radio programming, the invention of FM radio, radio's convergence with sound recording, and the influence of various formats. Finally, we survey the economic health, increasing conglomeration, and cultural impact of commercial and noncommercial radio today, including the emergence of noncommercial low-power FM service.

Early Technology and the Development of Radio

Radio did not emerge as a full-blown mass medium until the 1920s, though the technology that made radio possible had been evolving for years. The **telegraph**–the precursor of radio technology–was invented in the 1840s. American inventor Samuel Morse developed the first practical system, sending electrical impulses from a transmitter through a cable to a reception point. Using what became known as **Morse code**–a series of dots and dashes that stood for letters in the alphabet–telegraph operators transmitted news and messages simply by interrupting the electrical current along a wire cable. By 1844, Morse had set up the first telegraph line between Washington, D.C., and Baltimore. By 1861, telegraph lines ran coast to coast. By 1866, the first transatlantic cable, capable of transmitting about six words a minute, ran between Newfoundland and Ireland along the ocean floor.

Although a revolutionary technology, the telegraph had its limitations. For instance, while it dispatched complicated language codes, it was unable to transmit the human voice. Moreover, ships at sea still had no contact with the rest of the world. As a result, navies could not find out that wars had ceased on land and often continued fighting for months. Commercial shipping interests also lacked an efficient way to coordinate and relay information from land and between ships. What was needed was a telegraph without the wires.

"The telegraph and the telephone were instruments for private communication between two individuals. The radio was democratic; it directed its message to the masses and allowed one person to communicate with many.

The new medium of radio was to the printing press what the telephone had been to the letter: it allowed immediacy. It enabled listeners to experience an event as it happened."

TOM LEWIS,
EMPIRE OF THE AIR,
1991

Maxwell and Hertz Discover Radio Waves

The key development in wireless transmissions came from James Maxwell, a Scottish physicist who in the mid-1860s theorized the existence of **electromagnetic waves**: invisible electronic impulses similar to visible light. Maxwell's equations showed that electricity, magnetism, light, and heat are part of the same electromagnetic spectrum and radiate in space at the speed of light, about 186,000 miles per second (see Figure 4.1). Maxwell further theorized that a portion

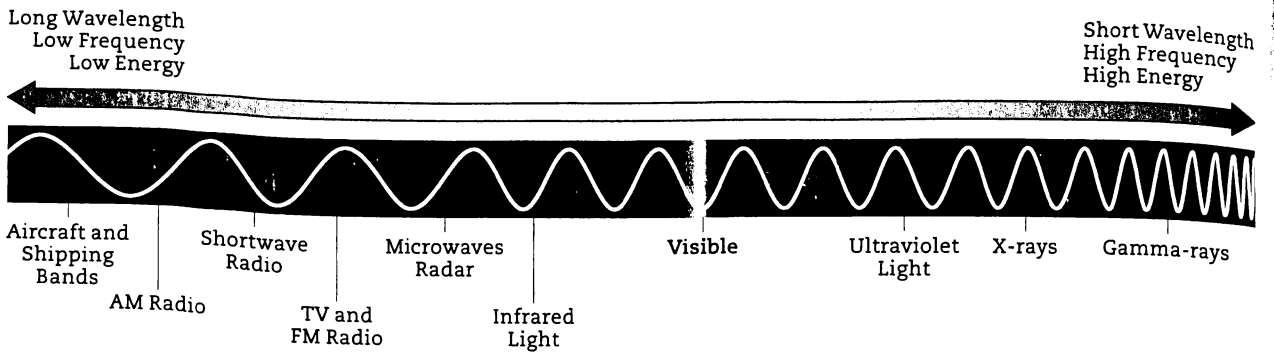


FIGURE 4.1
THE ELECTROMAGNETIC SPECTRUM
Source: NASA, http://imagine.gsfc.nasa.gov/docs/science/know_l1/emspectrum.html.

of these phenomena, later known as **radio waves**, could be harnessed so that signals could be sent from a transmission point to a reception point.

It was German physicist Heinrich Hertz, however, who in the 1880s proved Maxwell's theories. Hertz created a crude device that permitted an electrical spark to leap across a small gap between two steel balls. As the electricity jumped the gap, it emitted waves; this was the first recorded transmission and reception of an electromagnetic wave. Hertz's experiments significantly advanced the development of wireless communication.

Marconi and the Inventors of Wireless Telegraphy

In 1894, Guglielmo Marconi, a twenty-year-old, self-educated Italian engineer, read Hertz's work and understood that developing a way to send high-speed messages over great distances would transform communication, the military, and commercial shipping. Although revolutionary, the telephone and the telegraph were limited by their wires, so Marconi set about trying to make wireless technology practical. First, he attached Hertz's spark-gap transmitter to a Morse

Popular Radio and the Origins of Broadcasting

Samuel Morse
The first telegraph line is set up between Washington, D.C., and Baltimore, Maryland, in 1844. For the first time in history, communication exceeds the speed of land transportation (p. 109).

Guglielmo Marconi
The Italian inventor begins experiments on wireless telegraphy in 1894. He sees his invention as a means for point-to-point communication (p. 110).

Practical Use for Wireless Technology
Wireless operators save 705 lives during the *Titanic* tragedy in 1912, boosting interest in amateur radio across the United States (p. 114).

Commercial Radio
The first advertisements beginning in 1922 cause an uproar as people question the right to pollute the public airwaves with commercial messages (p. 117).

1830 1850 1870 1890 1910

Nikola Tesla
The Serbian-Croatian inventor creates a wireless device in America in 1892. His transmitter can make a tube thirty feet away light up (p. 112).

Lee De Forest
The American inventor writes the first dissertation on wireless technology in 1899 and goes on to invent wireless telephony and a means for amplifying radio sound (p. 113).

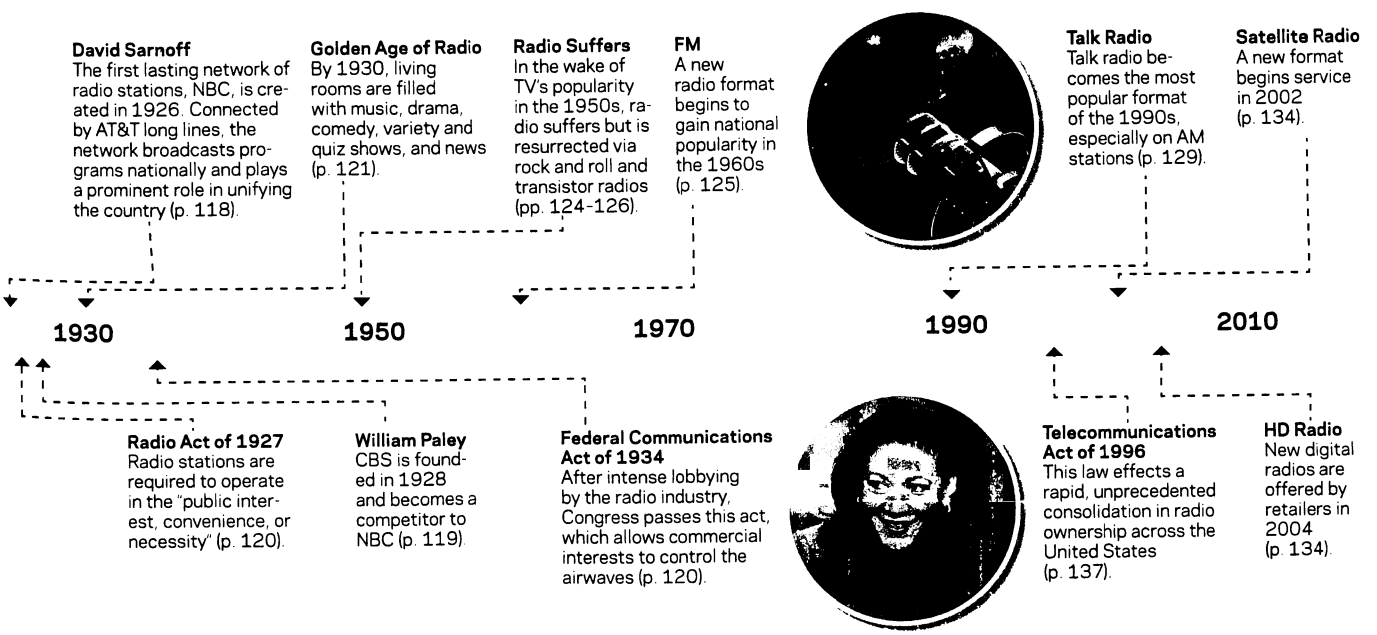
Wireless Ship Act
In 1910, Congress passes this act requiring that all major ships be equipped with wireless radio (p. 114).

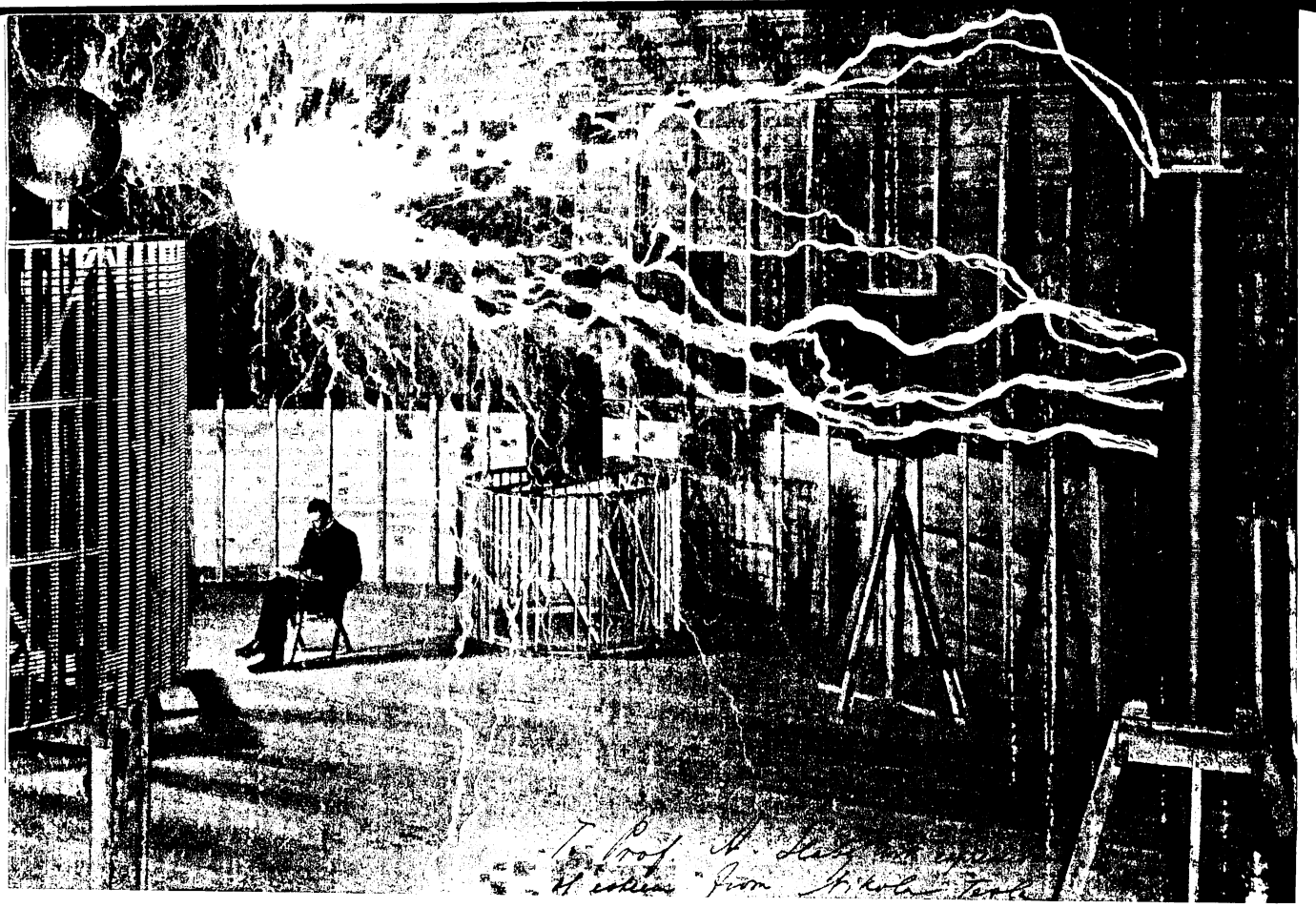
Amateur Radio Shutdown
The navy closes down all amateur radio operations in 1917 to ensure military security as the United States enters World War I (p. 115).

ITALIAN WIRELESS PIONEER Guglielmo Marconi (1874–1937) was a major figure in developing radio. In 1901, he transmitted the first radio signal across the Atlantic Ocean—from England to Newfoundland. Marconi shared the 1909 Nobel Prize for Physics for his contributions to wireless telegraphy, soon required on all seagoing ships and credited with saving more than seven hundred lives when the *Titanic* sank in 1912.

telegraph key, which could send out dot-dash signals. The electrical impulses traveled into a Morse inker, the machine that telegraph operators used to record the dots and dashes onto narrow strips of paper. Second, Marconi discovered that grounding–connecting the transmitter and receiver to the earth–greatly increased the distance over which he could send signals.

In 1896 Marconi traveled to England, where he received a patent on **wireless telegraphy**, a form of voiceless point-to-point communication. In London, in 1897, he formed the Marconi Wireless Telegraph Company, later known as British Marconi, and began installing wireless technology on British naval and private commercial ships. In 1899, he opened a branch in the United States, establishing a company nicknamed American Marconi. That same year, he sent the first wireless Morse code signal across the English Channel to France, and in 1901, he





NIKOLA TESLA
A double-exposed photograph combines the image of inventor Nikola Tesla reading a book in his Colorado Springs, Colorado, laboratory in 1899 with the image of his Tesla coil discharging several million volts

relayed the first wireless signal across the Atlantic Ocean. Although Marconi was a successful innovator and entrepreneur, he saw wireless telegraphy only as point-to-point communication, much like the telegraph and the telephone, not as a one-to-many mass medium. He also confined his applications to Morse code messages for military and commercial ships, leaving others to explore the wireless transmission of voice and music.

History often cites Marconi as the "father of radio," but another inventor unknown to him was making parallel discoveries about wireless telegraphy in Russia. Alexander Popov, a professor of physics in St. Petersburg, was experimenting with sending wireless messages over distances just as Marconi was undertaking similar work in Bologna, Italy. Popov announced to the Russian Physicist Society of St. Petersburg on May 7, 1895, that he had transmitted and received signals over a distance of six hundred yards.[5] Yet, Popov was an academic, not an entrepreneur, and after Marconi accomplished a similar feat that same summer, Marconi was the first to apply for and receive a patent. However, May 7 is celebrated as "Radio Day" in Russia.

It is important to note that the work of Popov and Marconi was preceded by that of Nikola Tesla, a Serbian-Croatian inventor who immigrated to New York in 1884. Tesla, who also conceived the high-capacity alternating current systems that made worldwide electrification possible, invented a wireless system in 1892. A year later, Tesla successfully demonstrated his device in St. Louis, with his transmitter lighting up a receiver tube thirty feet away.[6] However, Tesla's work was overshadowed by Marconi's; Marconi used much of Tesla's work in his own developments, and for years Tesla was not associated with the invention of radio. Tesla never received great financial benefits from his breakthroughs, but in 1943 (a few months after he died penniless in New York), the U.S. Supreme Court overturned Marconi's wireless patent and deemed Tesla the inventor of radio.[7]

Wireless Telephony: De Forest and Fessenden

"I discovered an Invisible Empire of the Air, intangible, yet solid as granite."

LEE DE FOREST, INVENTOR

In 1899, inventor Lee De Forest (who, in defiance of other inventors, liked to call himself the "father of radio") wrote the first Ph.D. dissertation on wireless technology, building on others' innovations. In 1901, De Forest challenged Marconi, who was covering New York's International Yacht Races for the Associated Press, by signing up to report the races for a rival news service. The competing transmitters jammed each other's signals so badly, however, that officials ended up relaying information on the races the traditional way—with flags and hand signals. The event exemplified a problem that would persist throughout radio's early development: noise and interference from competition for the finite supply of radio frequencies.

In 1902, De Forest set up the Wireless Telephone Company to compete head-on with American Marconi, by then the leader in wireless communication. A major difference between Marconi and De Forest was the latter's interest in wireless voice and music transmissions, later known as **wireless telephony** and eventually radio. Although sometimes an unscrupulous competitor (inventor Reginald Fessenden won a lawsuit against De Forest for using one of his patents without permission), De Forest went on to patent more than three hundred inventions.

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INVENTOR LEE DE FOREST (1873–1961) continued working in his Los Angeles workshop well into the 1950s. His lengthy radio career was marked by incredible innovations, missed opportunities, and poor business practices. In the end, De Forest was upset that radio content had stooped, in his opinion, to such low standards. With a passion for opera, he had hoped radio would be a tool for elite culture. If De Forest were alive today, what might be his reaction to the state of modern radio?

De Forest's biggest breakthrough was the development of the Audion, or triode, vacuum tube, which detected radio signals and then amplified them. De Forest's improvements greatly increased listeners' ability to hear dots and dashes and, later, speech and music on a receiver set. His modifications were essential to the development of voice transmission, long-distance radio, and television. In fact, the Audion vacuum tube, which powered radios until the arrival of transistors and solid state circuits in the 1950s, is considered by many historians to be the beginning of modern electronics. But again bitter competition taints De Forest's legacy; although De Forest won a twenty-year court battle for the rights to the Audion patent, most engineers at the time agreed that Edwin Armstrong (who later developed FM radio) was the true inventor and disagreed with the U.S. Supreme Court's 1934 decision on the case that favored De Forest.[8]

The credit for the first voice broadcast belongs to Canadian engineer Reginald Fessenden, formerly a chief chemist for Thomas Edison. Fessenden went to work for the U.S. Navy and eventually for General Electric (GE), where he played a central role in improving wireless signals. Both the navy and GE were interested in the potential for voice transmissions. On Christmas Eve in 1906, after GE built Fessenden a powerful transmitter, he gave his first public demonstration, sending a voice through the airwaves from his station at Brant Rock, Massachusetts. A radio historian describes what happened:

That night, ship operators and amateurs around Brant Rock heard the results: "someone speaking! . . . a woman's voice rose in song. . . . Next someone was heard reading a poem." Fessenden himself played "O Holy Night" on his violin. Though the fidelity was not all that it might be, listeners were captivated by the voices and notes they heard. No more would sounds be restricted to mere dots and dashes of the Morse code.[9]

Ship operators were astonished to hear voices rather than the familiar Morse code. (Some operators actually thought they were having a supernatural encounter.) This event showed that the wireless medium was moving from a point-to-point communication tool (wireless operator to

wireless operator) toward a one-to-many communication tool. **Broadcasting**, once an agricultural term that referred to the process of casting seeds over a large area, would come to mean the transmission of radio waves (and, later, TV signals) to a broad public audience. Prior to radio broadcasting, wireless was considered a form of **narrowcasting**, or person-to-person communication, like the telegraph and telephone.

In 1908, De Forest–declaring he was the record holder for long-distance wireless transmissions–said he transmitted gramophone music recordings from an experimental device atop the Eiffel Tower in Paris to locations more than four hundred miles away. In 1910, De Forest transmitted a performance of *Tosca* by the Metropolitan Opera to friends in the New York area with wireless receivers. At this point in time, radio passed from the novelty stage to the entrepreneurial stage, where various practical uses would be tested before radio would launch as a mass medium.


ST. LOUIS POST-DISPATCH HOME EDITION

1302 LIVES LOST WHEN "TITANIC" SANK; 868 SAVED

Carpathia Steaming to New York With Survivors; None on Other Ships

2-THIRDS WOMEN IN PARTIAL LIST OF THOSE RESCUED

Astor, Bett, Guggenheim and Many Other Famous Men Who Were on Board Not Mentioned

NEWS OF THE *TITANIC*
Despite the headline in the *St. Louis Post-Dispatch*, actually 1,523 people died and only 705 were rescued when the *Titanic* hit an iceberg on April 14, 1912 (the ship technically sank at 2:20 A.M. on April 15). The crew of the *Titanic* used the Marconi wireless equipment on board to send distress signals to other ships. Of the eight ships nearby, the *Carpathia* was the first to respond with lifeboats.

Regulating a New Medium

The two most important international issues affecting radio in the 1900s were ship radio requirements and signal interference. Congress passed the Wireless Ship Act in 1910, which required that all major U.S. seagoing ships carrying more than fifty passengers and traveling more than two hundred miles off the coast be equipped with wireless equipment with a one-hundred-mile range. The importance of this act was underscored by the *Titanic* disaster two years later. A brand-new British luxury steamer, the *Titanic* sank in 1912. Although more than fifteen hundred people died in the tragedy, wireless reports played a critical role in pinpointing the *Titanic*'s location, enabling rescue ships to save over seven hundred lives.

Radio Waves as a Natural Resource

In the wake of the *Titanic* tragedy, Congress passed the **Radio Act of 1912**, which addressed the problem of amateur radio operators increasingly cramming the airwaves. Because radio waves crossed state and national borders, legislators determined that broadcasting constituted a "natural resource"–a kind of interstate commerce. This meant that radio waves could not be owned; they were the collective property of all Americans, just like national parks. Therefore, transmitting on radio waves would require licensing in the same way that driving a car requires a license.

A short policy guide, the first Radio Act required all wireless stations to obtain radio licenses from the Commerce Department. This act, which governed radio until 1927, also formally adopted the SOS Morse-code distress signal that other countries had been using for several years. Further, the "natural resource" mandate led to the idea that radio, and eventually television, should provide a benefit to society–in the form of education and public service. The eventual establishment of public radio stations was one consequence of this idea, and the Fairness Doctrine was another.

The Impact of World War I

By 1915, more than twenty American companies sold wireless point-to-point communication systems, primarily for use in ship-to-shore communication. Having established a reputation for efficiency and honesty, American Marconi (a subsidiary of British Marconi) was the biggest and best of these companies. But in 1914, with World War I beginning in Europe and with America warily watching the conflict, the U.S. Navy questioned the wisdom of allowing a foreign-controlled company to wield so much power. American corporations, especially GE and AT&T, capitalized on the navy's xenophobia and succeeded in undercutting Marconi's influence.

As wireless telegraphy played an increasingly large role in military operations, the navy sought tight controls on information. When the United States entered the war in 1917, the navy closed down all amateur radio operations and took control of key radio transmitters to ensure military security. As the war was nearing its end in 1919, British Marconi placed an order with GE for twenty-four potent new alternators, which were strong enough to power a transoceanic system of radio stations that could connect the world. But the U.S. Navy–influenced by Franklin Roosevelt, at that time the navy's assistant secretary–grew concerned and moved to ensure that such powerful new radio technology would not fall under foreign control.

Roosevelt was guided in turn by President Woodrow Wilson's goal of developing the United States as an international power, a position greatly enhanced by American military successes during the war. Wilson and the navy saw an opportunity to slow Britain's influence over communication and to promote a U.S. plan for the control of the emerging wireless operations. Thus corporate heads and government leaders conspired to make sure radio communication would serve American interests.

The Formation of RCA

Some members of Congress and the corporate community opposed federal legislation that would grant the government or the navy a radio monopoly. Consequently, GE developed a compromise plan that would create a *private sector monopoly*–that is, a private company that would have the government's approval to dominate the radio industry. First, GE broke off negotiations to sell key radio technologies to European-owned companies like British Marconi, thereby limiting those companies' global reach. Second, GE took the lead in founding a new company, **Radio Corporation of America (RCA)**, which soon acquired American Marconi and radio patents of other U.S. companies. Upon its founding in 1919, RCA had pooled the necessary technology and patents to monopolize the wireless industry and expand American communication technology throughout the world.[10]

Under RCA's patents pool arrangement, wireless patents from the navy, AT&T, GE, the former American Marconi, and other companies were combined to ensure U.S. control over the manufacture of radio transmitters and receivers. Initially, AT&T, then the government-sanctioned monopoly provider of telephone services, manufactured most transmitters, while GE (and later Westinghouse) made radio receivers. RCA administered the pool, collecting patent royalties and distributing them to pool members. To protect these profits, the government did not permit RCA to manufacture equipment or to operate radio stations under its own name for several years. Instead, RCA's initial function was to ensure that radio parts were standardized by manufacturers and to control frequency interference by amateur radio operators, which increasingly became a problem after the war.

EARLY RADIO HOSTS Charles "Doc" Herrold (far left) became one of the first radio hosts in 1909 when his experiments with the wireless transmission of voice led him to set a regular time when he would air himself reading the newspaper or playing music. Soon his wife, Sybil, and one of his students, Ray Newby (left), joined Herrold with their own regularly scheduled shows. The broadcasts from this station in San Jose, California, eventually became KQW—which today exists as KCBS.

A government restriction at the time mandated that no more than 20 percent of RCA–and eventually any U.S. broadcasting facility–could be owned by foreigners. This restriction, later raised to 25 percent, became law in 1927 and applied to all U.S. broadcasting stocks and facilities. It is because of this rule that in 1985 Rupert Murdoch, the head of Australia's giant News Corp., became a U.S. citizen so he could buy a number of TV stations and form the Fox television network.

RCA's most significant impact was that it gave the United States almost total control over the emerging mass medium of broadcasting. At the time, the United States was the only country that placed broadcasting under the care of commercial, rather than military or government, interests. By pooling more than two thousand patents and sharing research developments, RCA ensured the global dominance of the United States in mass communication, a position it maintained in electronic hardware into the 1960s and maintains in program content today.

The Evolution of Radio

"I believe the quickest way to kill broadcasting would be to use it for direct advertising."

HERBERT HOOVER, SECRETARY OF COMMERCE, 1924

When Westinghouse engineer Frank Conrad set up a crude radio studio above his Pittsburgh garage in 1916, placing a microphone in front of a phonograph to broadcast music and news to his friends (whom Conrad supplied with receivers) two evenings a week on experimental station 8XK, he unofficially became one of the medium's first disc jockeys. In 1920, a Westinghouse executive, intrigued by Conrad's curious hobby, realized the potential of radio as a mass medium. Westinghouse then established station KDKA, which is generally regarded as the first commercial broadcast station. KDKA is most noted for airing national returns from the Cox-Harding presidential election on November 2, 1920, an event most historians consider the first professional broadcast.

Other amateur broadcasters could also lay claim to being first. One of the earliest stations, operated by Charles "Doc" Herrold in San Jose, California, began in 1909 and later became KCBS. Additional experimental stations–in places like New York; Detroit; Medford, Massachusetts; and Pierre, South Dakota–broadcast voice and music prior to the establishment of KDKA. But KDKA's success, with the financial backing of Westinghouse, signaled the start of broadcast radio.

In 1921, the U.S. Commerce Department officially licensed five radio stations for operation; by early 1923, more than six hundred commercial and noncommercial stations were operating. Some stations were owned by AT&T, GE, and Westinghouse, but many were run by amateurs or were independently owned by universities or businesses. By the end of 1923, as many as 550,000 radio receivers, most manufactured by GE and Westinghouse, had been sold for about $55 each (about $693 in today's dollars). Just as the "guts" of the phonograph had been put inside a piece of furniture to create a consumer product, the vacuum tubes, electrical posts, and bulky batteries that made up the radio receiver were placed inside stylish furniture and marketed to households. By 1925, 5.5 million radio sets were in use across America, and radio was officially a mass medium.

The RCA Partnership Unravels

In 1922, in a major power grab, AT&T, which already had a government-sanctioned monopoly in the telephone business, decided to break its RCA agreements in an attempt to monopolize radio as well. Identifying the new medium as the "wireless telephone," AT&T argued that broadcasting was merely an extension of its control over the telephone. Ultimately, the corporate

giant complained that RCA had gained too much monopoly power. In violation of its early agreements with RCA, AT&T began making and selling its own radio receivers.

In the same year, AT&T started WEAF (now WNBC) in New York, the first radio station to regularly sell commercial time to advertisers. AT&T claimed that under the RCA agreements, it had the exclusive right to sell ads, which AT&T called *toll broadcasting*. Most people in radio at the time recoiled at the idea of using the medium for crass advertising, viewing it instead as a public information service. In fact, stations that had earlier tried to sell ads received "cease and desist" letters from the Department of Commerce. But by August 1922, AT&T had nonetheless sold its first ad to a New York real estate developer for $50. The idea of promoting the new medium as a public service, along the lines of today's noncommercial National Public Radio (NPR), ended when executives realized that radio ads offered another opportunity for profits. Advertising would ensure profits long after radio-set sales had saturated the consumer market.

WESTINGHOUSE ENGINEER FRANK CONRAD
Broadcasting from his garage, Conrad turned his hobby into Pittsburgh's KDKA, one of the first radio stations. Although this early station is widely celebrated in history books as the first broadcasting outlet, one can't underestimate the influence Westinghouse had in promoting this "historical first." Westinghouse clearly saw the celebration of Conrad's garage as a way to market the company and its radio equipment. The resulting legacy of Conrad's garage has thus overshadowed other individuals who also experimented with radio broadcasting.

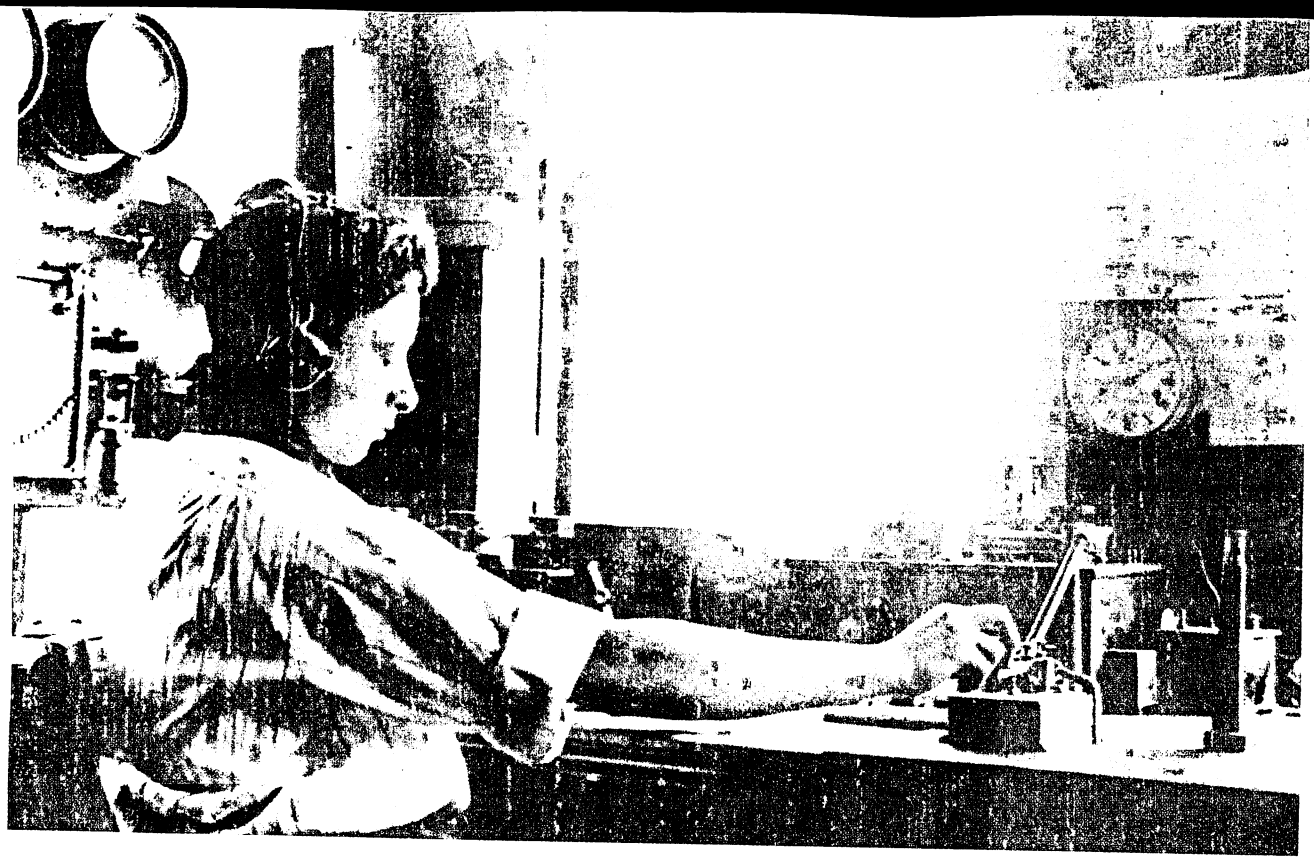
The initial strategy behind AT&T's toll broadcasting idea was an effort to conquer radio. By its agreements with RCA, AT&T retained the rights to interconnect the signals between two or more radio stations via telephone wires. In 1923, when AT&T aired a program simultaneously on its flagship WEAF station and on WNAC in Boston, the phone company created the first **network**: a cost-saving operation that links (at that time, through special phone lines and, today, through satellite relays) a group of broadcast stations that share programming produced at a central location. By the end of 1924, AT&T had interconnected twenty-two stations to air a talk by President Calvin Coolidge. Some of these stations were owned by AT&T, but most simply consented to become AT&T "affiliates," agreeing to air the phone company's programs. These network stations informally became known as the *telephone group* and later as the Broadcasting Corporation of America (BCA).

In response, GE, Westinghouse, and RCA interconnected a smaller set of competing stations, known as the *radio group*. Initially, their network linked WGY in Schenectady, New York (then GE's national headquarters), and WJZ in Manhattan. The radio group had to use inferior Western Union telegraph lines when AT&T denied them access to telephone wires. By this time, AT&T had sold its stock in RCA and refused to lease its lines to competing radio networks. The telephone monopoly was now enmeshed in a battle to defeat RCA for control of radio.

This clash, among other problems, eventually led to a government investigation and an arbitration settlement in 1925. In the agreement, the Justice Department, irritated by AT&T's power grab, redefined patent agreements. AT&T received a monopoly on providing the wires, known as *long lines*, to interconnect stations nationwide. In exchange, AT&T sold its BCA network to RCA for $1 million and agreed not to reenter broadcasting for eight years (a banishment that actually extended into the 1990s).

Sarnoff and NBC: Building the "Blue" and "Red" Networks

After Lee De Forest, David Sarnoff was among the first to envision wireless telegraphy as a modern mass medium. From the time he served as Marconi's personal messenger (at age fifteen), Sarnoff rose rapidly at American Marconi. He became a wireless operator, helping to relay information about the *Titanic* survivors in 1912. Promoted to a series of management positions, Sarnoff was closely involved in RCA's creation in 1919, when most radio executives



DAVID SARNOFF
As a young man, Sarnoff taught himself Morse code and learned as much as possible in Marconi's experimental shop in New York. He was then given a job as wireless operator for the station on Nantucket Island. He went on to create NBC and network radio. Sarnoff's calculated ambition in the radio industry can easily be compared to Bill Gates's drive to control the computer software and Internet industries.

saw wireless merely as point-to-point communication. But with Sarnoff as RCA's first commercial manager, radio's potential as a mass medium was quickly realized. In 1921, at age thirty, Sarnoff became RCA's general manager.

After RCA bought AT&T's telephone group network (BCA), Sarnoff created a new subsidiary in September 1926 called the National Broadcasting Company (NBC). Its ownership was shared by RCA (50 percent), General Electric (30 percent), and Westinghouse (20 percent). This loose network of stations would be hooked together by AT&T long lines. Shortly thereafter, the original telephone group became known as the NBC-Red network, and the radio group (the network previously established by RCA, GE, and Westinghouse) became the NBC-Blue network.

Although NBC owned a number of stations by the late 1920s, many independent stations also began affiliating with the NBC networks to receive programming. An affiliate station, though independently owned, signs a contract to be part of a network and receives money to carry the network's programs. In exchange, the network reserves time slots, which it sells to national advertisers. By 1933, NBC-Red had twenty-eight affiliates and NBC-Blue had twenty-four.

Recall that the rationale behind a network is an economic one: A network enables stations to control program costs and avoid unnecessary duplication. As early as 1923, AT&T had realized that it would be cheaper to produce programs at one station and broadcast them simultaneously over a network of owned or affiliated stations than for each station to generate its own programs. Such a network centralized costs and programming by bringing the best musical, dramatic, and comedic talent to one place, where programs could be produced and then distributed all over the country.

Network radio may actually have helped modernize America by de-emphasizing the local and the regional in favor of national programs broadcast to nearly everyone. For example, when Charles Lindbergh returned from the first solo transatlantic flight in 1927, an estimated twenty-five to thirty million people listened to his welcome-home party on the six million radio sets then in use. At the time, it was the largest shared audience experience in the history of any mass medium.

David Sarnoff's leadership at RCA was capped by two other negotiations that solidified his stature as the driving force behind radio's development as a modern medium. In 1929, Sarnoff

cut a deal with General Motors for the manufacture of car radios, which had been invented a year earlier by William Lear (later the designer of the Learjet), who sold the radios under the brand name Motorola. Sarnoff also merged RCA with the Victor Talking Machine Company. Afterward, until the mid-1960s, the company was known as RCA Victor, adopting as its corporate symbol the famous terrier sitting alertly next to a Victrola radio-phonograph. The merger gave RCA control over Victor's records and recording equipment, making the radio company a major player in the sound recording industry. In 1930, David Sarnoff became president of RCA, and he ran it for the next forty years.

"I have in mind a plan of development which would make radio a 'household utility' in the same sense as the piano or phonograph. The idea is to bring music into the house by wireless."

DAVID SARNOFF, AGE 24, 1915 MEMO

Government Scrutiny Ends RCA-NBC Monopoly

As early as 1923, the Federal Trade Commission had charged RCA with violations of antitrust laws but allowed the monopoly to continue. By the late 1920s, the government, concerned about NBC's growing control over radio content, intensified its scrutiny. Then, in 1930, when RCA bought GE and Westinghouse's interests in the two NBC networks, federal marshals charged RCA/NBC with a number of violations, including exercising too much control over manufacturing and programming. Although the government had originally sanctioned a closely supervised monopoly for wireless communication, RCA products, its networks, and the growth of the new mass medium dramatically changed the radio industry by the late 1920s. After the collapse of the stock market in 1929, the public became increasingly distrustful of big business. In 1932, the government revoked RCA's monopoly status.

RCA acted quickly. To eliminate its monopolizing partnerships, Sarnoff's company bought out GE's and Westinghouse's remaining shares in RCA's manufacturing business. Now RCA would compete directly against GE, Westinghouse, and other radio manufacturers, encouraging more competition in the radio manufacturing industry. Ironically, in the mid-1980s, GE bought RCA, a shell of its former self and no longer competitive with foreign electronics firms.[11] GE was chiefly interested in RCA's brand-name status and its still-lucrative subsidiary, NBC.

CBS and Paley: Challenging NBC

Even with RCA's head start and its favored status, the two NBC networks faced competitors in the late 1920s. The competitors, however, all found it tough going. One group, United Independent Broadcasters (UIB), even lined up twelve prospective affiliates and offered them $500 a week for access to ten hours of station time in exchange for quality programs. UIB was cash-poor, however, and AT&T would not rent the new company its lines to link the affiliates.

Enter the Columbia Phonograph Company, which was looking for a way to preempt RCA's merger with the Victor Company, then the record company's major competitor. With backing from Columbia, UIB launched the new Columbia Phonograph Broadcasting System, a wobbly sixteen-affiliate network in 1927, nicknamed CPBS. But after losing $100,000 in the first month, the record company pulled out. Later, CPBS dropped the word *Phonograph* from its title, creating the Columbia Broadcasting System (CBS).

In 1928, William Paley, the twenty-seven-year-old son of Sam Paley, owner of a Philadelphia cigar company, bought a controlling interest in CBS to sponsor their cigar brand, La Palina. One of Paley's first moves was to hire the public relations pioneer (and Sigmund Freud's nephew) Edward Bernays to polish the new network's image. (Bernays played a significant role in the development of the public relations industry; see Chapter 12.) Paley and Bernays modified a concept called **option time**, in which CBS paid affiliate stations $50 per hour for an option on a portion

WILLIAM S. PALEY (below, left) ran CBS for more than fifty years. He first took control of the struggling radio network in 1928, saw CBS through its transition into TV, and helped earn CBS the label "Tiffany Network" for his early support of quality programming and network news. But he was also criticized for undermining his news division to sidestep controversy or to increase profits.

"Overnight, it seemed, everyone had gone into broadcasting: newspapers, banks, public utilities, department stores, universities and colleges, cities and towns, pharmacies, creameries, and hospitals."

TOM LEWIS, RADIO HISTORIAN

of their time. The network provided programs to the affiliates and sold ad space or sponsorships to various product companies. In theory, CBS could now control up to twenty-four hours a day of its affiliates' radio time. Some affiliates received thousands of dollars per week merely to serve as conduits for CBS programs and ads. Because NBC was still charging some of its affiliates as much as $96 a week to carry its network programs, the CBS offer was extremely appealing.

By 1933, Paley's efforts had netted CBS more than ninety affiliates, many of them defecting from NBC. Paley also concentrated on developing news programs and entertainment shows, particularly soap operas and comedy-variety series. In the process, CBS successfully raided NBC, not just for affiliates but for top talent as well. Throughout the 1930s and 1940s, Paley lured a number of radio stars from NBC, including Jack Benny, Frank Sinatra, George Burns, Gracie Allen, and Groucho Marx. During World War II, Edward R. Murrow's powerful firsthand news reports from bomb-riddled London established CBS as the premier radio news network, a reputation it carried forward to television. In 1949, near the end of big-time network radio, CBS finally surpassed NBC as the highest-rated network. Although William Paley had intended to run CBS only for six months to help get it off the ground, he ultimately ran it for more than fifty years.

Bringing Order to Chaos with the Radio Act of 1927

In the 1920s, as radio moved from narrowcasting to broadcasting, the battle for more frequency space and less channel interference intensified. Manufacturers, engineers, station operators, network executives, and the listening public demanded action. Many wanted more sweeping regulation than the simple licensing function granted under the Radio Act of 1912, which gave the Commerce Department little power to deny a license or to unclog the airwaves.

Beginning in 1924, Commerce Secretary Herbert Hoover ordered radio stations to share time by setting aside certain frequencies for entertainment and news and others for farm and weather reports. To challenge Hoover, a station in Chicago jammed the airwaves, intentionally moving its signal onto an unauthorized frequency. In 1926, the courts decided that based on the existing Radio Act, Hoover had the power only to grant licenses, not to restrict stations from operating. Within the year, two hundred new stations clogged the airwaves, creating a chaotic period in which nearly all radios had poor reception. By early 1927, sales of radio sets had declined sharply.

"It is my personal opinion that American listeners would not stand for the payment of a receiving-set [radio] tax. It is my judgment that it would be most unpopular in this country. It is not the American way of accomplishing things."

ANNING S. PRALL, CHAIRMAN OF THE FCC, 1936

To restore order to the airwaves, Congress passed the **Radio Act of 1927**, which stated an extremely important principle–licensees did not *own* their channels but could only license them as long as they operated to serve the "public interest, convenience, or necessity." To oversee licenses and negotiate channel problems, the 1927 act created the **Federal Radio Commission (FRC)**, whose members were appointed by the president. Although the FRC was intended as a temporary committee, it grew into a powerful regulatory agency. In 1934, with passage of the **Communications Act of 1934**, the FRC became the **Federal Communications Commission (FCC)**. Its jurisdiction covered not only radio but also the telephone and the telegraph (and later television, cable, and the Internet). More significantly, by this time Congress and the president had sided with the already-powerful radio networks and acceded to a system of advertising-supported commercial broadcasting as best serving "public interest, convenience, or necessity," overriding the concerns of educational, labor, and citizen broadcasting advocates.[12] (See Table 4.1.)

In 1941, an activist FCC went after the networks. Declaring that NBC and CBS could no longer force affiliates to carry programs they did not want, the government outlawed the practice of option time that Paley had used to build CBS into a major network. The FCC also demanded that RCA sell one of its two NBC networks. RCA and NBC claimed that the rulings would bankrupt them. The Supreme Court sided with the FCC, however, and RCA eventually

Act	Provisions	Effects
Wireless Ship Act of 1910	Required U.S. seagoing ships carrying more than fifty passengers and traveling more than two hundred miles off the coast to be equipped with wireless equipment with a one-hundred-mile range.	Saved lives at sea, including more than seven hundred rescued by ships responding to the *Titanic*'s distress signals two years later.
Radio Act of 1912	Required radio operators to obtain a license, gave the Commerce Department the power to deny a license, and began a uniform system of assigning call letters to identify stations.	The federal government begins to assert control over radio. Penalties established for stations that interfere with other stations' signals.
Radio Act of 1927	Established the Federal Radio Commission (FRC) as a temporary agency to oversee licenses and negotiate channel assignments.	First expressed the now-fundamental principle that licensees did not own their channels but could only license them as long as they operated to serve the "public interest, convenience, or necessity."
Communications Act of 1934	Established the Federal Communications Commission (FCC) to replace the FRC. The FCC regulated radio, the telephone, the telegraph, and later television, cable, and the Internet.	Congress tacitly agrees to a system of advertising-supported commercial broadcasting despite concerns of the public.
Telecommunications Act of 1996	Eliminated most radio and television station ownership rules, some dating back more than fifty years.	Enormous national and regional station groups form, dramatically changing the sound and localism of radio in the United States.

TABLE 4.1
MAJOR ACTS IN THE HISTORY OF U.S. RADIO

sold NBC-Blue to a group of businessmen for $8 million in the mid-1940s. It became the American Broadcasting Company (ABC). These government crackdowns brought long-overdue reform to the radio industry, but they had not come soon enough to prevent considerable damage to noncommercial radio.

The Golden Age of Radio

Many programs on television today were initially formulated for radio. The first weather forecasts and farm reports on radio began in the 1920s. Regularly scheduled radio news analysis started in 1927, with H. V. Kaltenborn, a reporter for the *Brooklyn Eagle*, providing commentary on AT&T's WEAF. The first regular network news analysis began on CBS in 1930, featuring Lowell Thomas, who would remain on radio for forty-four years.

Early Radio Programming

Early on, only a handful of stations operated in most large radio markets, and popular stations were affiliated with CBS, NBC-Red, or NBC-Blue. Many large stations employed their own in-house orchestras and aired live music daily. Listeners had favorite evening programs, usually fifteen minutes long, to which they would tune in each night. Families gathered around the radio to hear such shows as *Amos 'n' Andy*, *The Shadow*, *The Lone Ranger*, *The Green Hornet*, and *Fibber McGee and Molly*, or one of President Franklin Roosevelt's fireside chats.

"Adolf Hitler, the German fascist chief, is snorting fire. There are now two Mussolinis in the world, which seems to offer a rousing time."

LOWELL THOMAS'S FIRST REPORT FOR CBS IN 1930

Among the most popular early programs on radio, the variety show was the forerunner to popular TV shows like the *Ed Sullivan Show*. The variety show, developed from stage acts and vaudeville, began with the *Eveready Hour* in 1923 on WEAF. Considered experimental, the program presented classical music, minstrel shows, comedy sketches, and dramatic readings. Stars from vaudeville, musical comedy, and New York theater and opera would occasionally make guest appearances.

By the 1930s, studio-audience quiz shows–*Professor Quiz* and the *Old Time Spelling Bee*–had emerged. Other quiz formats, used on *Information Please* and *Quiz Kids*, featured guest panelists. The quiz formats were later copied by television, particularly in the 1950s. *Truth or Consequences*, based on a nineteenth-century parlor game, first aired on radio in 1940 and featured guests performing goofy stunts. It ran for seventeen years on radio and another

FIRESIDE CHATS
This giant bank of radio network microphones makes us wonder today how President Franklin D. Roosevelt managed to project such an intimate and reassuring tone in his famous fireside chats. Conceived originally to promote FDR's New Deal policies amid the Great Depression, these chats were delivered between 1933 and 1944 and touched on national topics. Roosevelt was the first president to effectively use broadcasting to communicate with citizens; he also gave nearly a thousand press conferences during his twelve-plus years as president, revealing a strong commitment to use media and news to speak early and often with the American people.

"There are three things which I shall never forget about America—the Rocky Mountains, Niagara Falls, and *Amos 'n' Andy*."

GEORGE BERNARD SHAW, IRISH PLAYWRIGHT

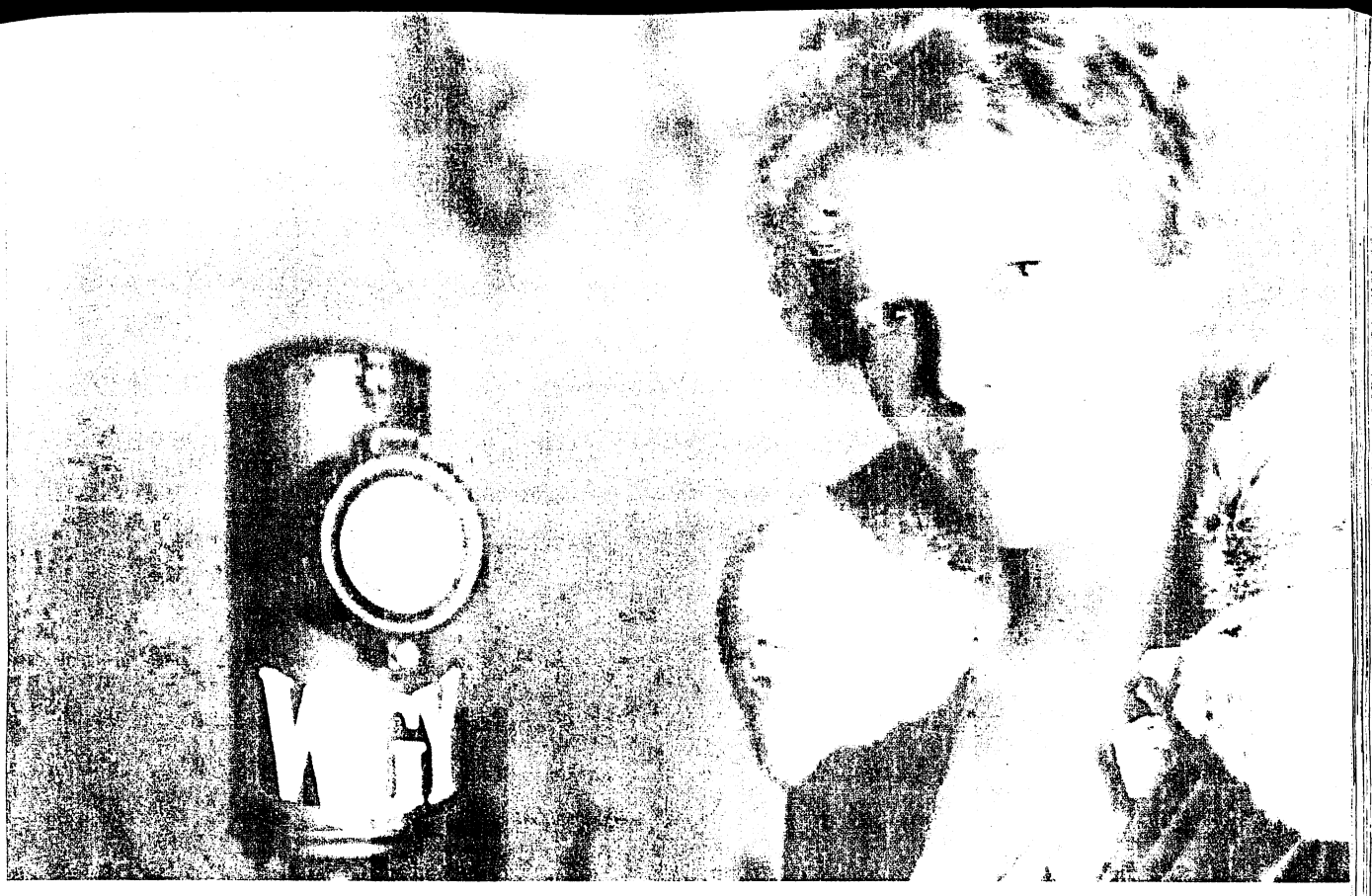
twenty-seven on television, influencing TV stunt shows like CBS's *Beat the Clock* in the 1950s and NBC's *Fear Factor* in the early 2000s.

Dramatic programs, mostly radio plays that were broadcast live from theaters, developed as early as 1922. Historians mark the appearance of *Clara, Lu, and Em* on WGN in 1931 as the first soap opera. One year later, Colgate-Palmolive bought the program, put it on NBC, and began selling the soap products that gave this dramatic genre its distinctive nickname. Early "soaps" were fifteen minutes in length and ran five or six days a week. It wasn't until mid-1960s television that soaps were extended to thirty minutes, and by the late 1970s, some had expanded to sixty minutes. Still a fixture on CBS, *Guiding Light* actually began on radio in 1937 and moved to television in 1952 (the only radio soap to successfully make the transition). By 1940, sixty different soap operas occupied nearly eighty hours of network radio time each week.

Most radio programs had a single sponsor that created and produced each show. The networks distributed these programs live around the country, charging the sponsors advertising fees. Many shows–the *Palmolive Hour*, *General Motors Family Party*, the *Lucky Strike Orchestra*, and the *Eveready Hour* among them–were named after the sole sponsor's product.

Radio Programming as a Cultural Mirror

The situation comedy, a major staple of TV programming today, began on radio in the mid-1920s. By the early 1930s, the most popular comedy was *Amos 'n' Andy*, which started on Chicago radio in 1925 before moving to NBC-Blue in 1929. *Amos 'n' Andy* was based on the conventions of the nineteenth-century minstrel show and featured black characters stereotyped as shiftless and



RADIO BRINGS ADVENTURE HOME
Aviator Amelia Earhart was one of a number of people to speak via radio with explorer Richard Byrd and his expedition team as they explored the Antarctic in 1929. These conversations were broadcast to the American public every two weeks. The Byrd expedition (1928–30) brought the novelty of advanced radio systems to a captivated home audience.

stupid. Created as a blackface stage act by two white comedians, Charles Correll and Freeman Gosden, the program was criticized as racist. But NBC and the program's producers claimed that *Amos 'n' Andy* was as popular among black audiences as among white listeners.[13]

Amos 'n' Andy also launched the idea of the serial show: a program that featured continuing story lines from one day to the next. The format was soon copied by soap operas and other radio dramas. The show aired six nights a week from 7:00 to 7:15 P.M. During the show's first year on the network, radio-set sales rose nearly 25 percent nationally. To keep people coming to restaurants and movie theaters, owners broadcast *Amos 'n' Andy* in lobbies, rest rooms, and entryways. Early radio research estimated that the program aired in more than half of all radio homes in the nation during the 1930-31 season, making it the most popular radio series in history. In 1951 it made a brief transition to television (Correll and Gosden sold the rights to CBS for $1 million), becoming the first TV series to have an entirely black cast. But, amidst a strengthening Civil Rights movement and a formal protest by the NAACP (it argued that "every character is either a clown or a crook"), CBS canceled the program in 1953.[14]

The Authority of Radio

The most famous single radio broadcast of all time was an adaptation of H. G. Wells's *War of the Worlds* on the radio series *Mercury Theater of the Air*. Orson Welles produced, hosted, and acted in this popular series, which adapted science fiction, mystery, and historical adventure dramas for radio. On Halloween eve in 1938, the twenty-three-year-old Welles aired the 1898 Martian invasion novel in the style of a radio news program. For people who missed the opening disclaimer, the program sounded like a real news report, with eyewitness accounts of battles between Martian invaders and the U.S. Army.

The program created a panic that lasted several hours. In New Jersey, some people walked through the streets with wet towels around their heads for protection from deadly Martian heat rays. In New York, young men reported to their National Guard headquarters to prepare for battle.

EARLY RADIO'S EFFECT AS A MASS MEDIUM
On Halloween eve in 1938, Orson Welles's radio dramatization of *War of the Worlds* (right) created a panic up and down the East Coast, especially in Grover's Mill, New Jersey—the setting for the fictional Martian invasion that many listeners assumed was real. A seventy-six-year-old Grover's Mill resident (far right) guards a warehouse against alien invaders.

Across the nation, calls jammed police switchboards. Afterward, Orson Welles, once the radio voice of *The Shadow*, used the notoriety of this broadcast to launch a film career. Meanwhile, the FCC called for stricter warnings both before and during programs that imitated the style of radio news.

Radio Reinvents Itself

Older media forms do not generally disappear when confronted by newer forms. Instead, they adapt. Although radio threatened sound recording in the 1920s, the recording industry adjusted to the economic and social challenges posed by radio's arrival. Remarkably, the arrival of television in the 1950s marked the only time in media history in which a new medium stole virtually every national programming and advertising strategy from an older medium. Television snatched radio's advertisers, program genres, major celebrities, and large evening audiences. The TV set even physically displaced the radio as the living room centerpiece across America. Nevertheless, radio adapted and continued to reach an audience.

The story of radio's evolution and survival is especially important today, as newspapers and magazines appear online and as publishers produce audio books and e-books for new generations of "readers." In contemporary culture, we have grown accustomed to such media convergence, but to best understand this blurring of the boundaries between media forms, it is useful to look at the 1950s and the ways in which radio responded to the advent of television.

Transistors Make Radio Portable

A key development in radio's adaptation to television occurred with the invention of the transistor by Bell Laboratories in 1947. **Transistors** were small electrical devices that, like vacuum tubes, could receive and amplify radio signals. However, they used less power and produced less heat than vacuum tubes, and they were more durable and less expensive. Best of

all, they were tiny. Transistors, which also revolutionized hearing aids, constituted the first step in replacing bulky and delicate tubes, leading eventually to today's integrated circuits.

Texas Instruments marketed the first transistor radio in 1953 for about $40. Using even smaller transistors, Sony introduced the pocket radio in 1957. But it wasn't until the 1960s that transistor radios became cheaper than conventional tube and battery radios. For a while, the term *transistor* became a synonym for a small, portable radio.

The development of transistors let radio go where television could not–to the beach, to the office, into bedrooms and bathrooms, and into nearly all new cars. (Before the transistor, car radios were a luxury item.) By the 1960s, most radio listening took place outside the home.

POCKET TRANSISTOR RADIOS like this early model became popular in the late 1950s.

The FM Revolution and Edwin Armstrong

By the time the broadcast industry launched commercial television in the 1950s, many people, including David Sarnoff of RCA, were predicting radio's demise. To fund television's development and protect his radio holdings, Sarnoff had even delayed a dramatic breakthrough in broadcast sound, what he himself called a "revolution"–FM radio.

Edwin Armstrong, who first discovered and developed FM radio in the 1920s and early 1930s, is often considered the most prolific and influential inventor in radio history. He understood the impact of De Forest's vacuum tube, and he used it to invent an amplifying system that enabled radio receivers to pick up distant signals. Armstrong's innovations rendered obsolete the enormous alternators used for generating power in early radio transmitters. In 1922, he sold a "super" version of his circuit to RCA for $200,000 and sixty thousand shares of RCA stock, which made him a millionaire as well as RCA's largest private stockholder.

Armstrong also worked on the major problem of radio reception–electrical interference. Between 1930 and 1933, the inventor filed five patents on **FM**, or frequency modulation. Offering static-free radio reception, FM supplied greater fidelity and clarity than AM, making FM ideal for music. **AM**, or amplitude modulation (*modulation* refers to the variation in waveforms), stressed the volume, or height, of radio waves; FM accentuated the pitch, or distance, between radio waves (see Figure 4.2 on page 126).

Although David Sarnoff, the president of RCA, thought that television would replace radio, he helped Armstrong set up the first experimental FM station atop the Empire State Building in New York City. Eventually, though, Sarnoff thwarted FM's development (which he was able to do because RCA had an option on Armstrong's new patents). Instead, in 1935 Sarnoff threw RCA's considerable weight behind the development of television. With the FCC allocating and reassigning scarce frequency spaces, RCA wanted to ensure that channels went to television before they went to FM. But most of all, Sarnoff wanted to protect RCA's existing AM empire. Given the high costs of converting to FM and the revenue needed for TV experiments, Sarnoff decided to close down Armstrong's station.

Armstrong forged ahead without RCA. He founded a new FM station and advised other engineers, who started more than twenty experimental stations between 1935 and the early 1940s. In 1941, the FCC approved limited space allocations for commercial FM licenses. During the next few years, FM grew in fits and starts. Between 1946 and early 1949, the number of commercial FM stations expanded from 48 to 700. But then the FCC moved FM's frequency space to a new band on the electromagnetic spectrum, rendering some 400,000 prewar FM receiver sets useless. FM's future became uncertain, and by 1954, the number of FM stations had fallen to 560.

"Armstrong was a lone experimenter, Sarnoff a company man."

ERIK BARNOUW, MEDIA HISTORIAN

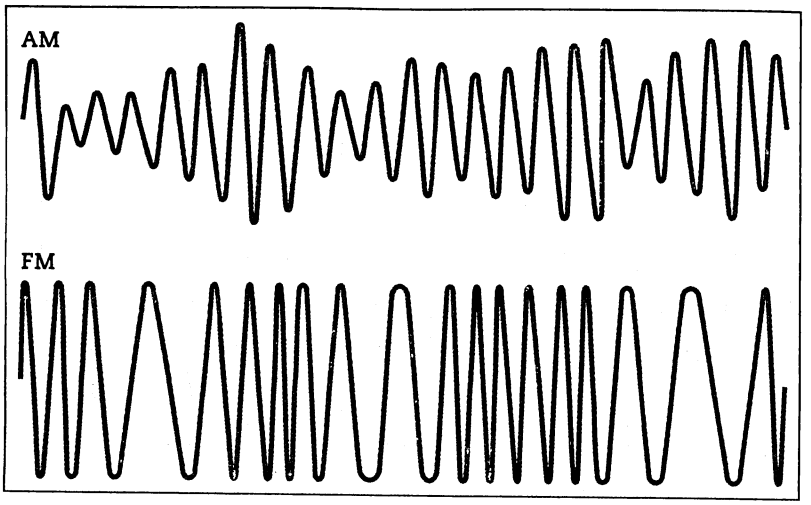


FIGURE 4.2
AM AND FM WAVES
Source: Adapted from David Cheshire, The Video Manual, 1982.

On January 31, 1954, Edwin Armstrong, weary from years of legal skirmishes over patents with RCA, Lee De Forest, and others, wrote a note apologizing to his wife, removed the air conditioner from his thirteenth-story New York apartment window, and jumped to his death. A month later, David Sarnoff announced record profits of $850 million for RCA, with TV sales accounting for 54 percent of the company's earnings. In the early 1960s, the FCC opened up more spectrum space for the superior sound of FM, infusing new life into radio.

Although AM stations had greater reach, they could not match the crisp fidelity of FM, which made FM preferable for music. In the early 1970s, about 70 percent of listeners tuned almost exclusively to AM radio. By the 1980s, however, FM had surpassed AM in profitability. By the 2000s, more than 75 percent of all listeners preferred FM, and about 3,600 commercial and almost 2,900 educational FM stations were in operation. The expansion of FM represented one of the chief ways radio survived television and Sarnoff's gloomy predictions.

The Rise of Format and Top 40 Radio

Live and recorded music had long been radio's single biggest staple, accounting for 48 percent of all programming in 1938. Although live music on radio was generally considered superior to recorded music, early disc jockeys made a significant contribution to the latter. They demonstrated that music alone could drive radio. In fact, when television snatched radio's program ideas and national sponsors, radio's dependence on recorded music became a necessity and helped the medium survive the 1950s.

As early as 1949, station owner Todd Storz in Omaha, Nebraska, experimented with formula-driven radio, or **format radio**. Under this system, management rather than deejays controlled programming each hour. When Storz and his program manager noticed that bar patrons and waitresses repeatedly played certain favorite songs from the forty records available in a jukebox, they began researching record sales to identify the most popular tunes. From observing jukebox culture, Storz hit on the idea of **rotation**: playing the top songs many times during the day. By the mid-1950s, the management-control idea combined with the rock-and-roll explosion, and the **Top 40 format** was born. Although the term *Top 40* derived from the number of records stored in a jukebox, this format came to refer to the forty most popular hits in a given week as measured by record sales.

"Radio affects most people intimately, person-to-person, offering a world of unspoken communication between writer-speaker and listener. That is the immediate aspect of radio. A private experience."

MARSHALL McLUHAN, *UNDERSTANDING MEDIA*, 1964

As format radio grew, program managers combined rapid deejay chatter with the best-selling songs of the day and occasional oldies–popular songs from a few months earlier. By the early 1960s, to avoid "dead air," managers asked deejays to talk over the beginning and the end of a song so that listeners would feel less compelled to switch stations. Ads, news, weather forecasts, and station identifications were all designed to fit a consistent station environment. Listeners, tuning in at any moment, would recognize the station by its distinctive sound.

In format radio, management carefully coordinates, or programs, each hour, dictating what the deejay will do at various intervals throughout each hour of the day (see Figure 4.3). Management creates a program log–once called a *hot clock* in radio jargon–that deejays must follow. By the mid-1960s, one study had determined that in a typical hour on Top 40, listeners could expect to hear about twenty ads; numerous weather, time, and contest announcements;

multiple recitations of the station's call letters; about three minutes of news; and approximately twelve songs.

Radio managers further sectioned off programming into *day parts*, which typically consisted of time blocks covering 6 to 10 A.M., 10 A.M. to 3 P.M., 3 to 7 P.M., and 7 P.M. to midnight. Each day part, or block, was programmed through ratings research according to who was listening. For instance, a Top 40 station would feature its top deejays in the morning and afternoon periods when audiences, many riding in cars, were largest. From 10 A.M. to 3 P.M., research determined that women at home and secretaries at work usually controlled the dial, so program managers, capitalizing on the gender stereotypes of the day, played more romantic ballads and less hard rock. Teenagers tended to be heavy evening listeners, so program managers often discarded news breaks at this time, since research showed that teens turned the dial when news came on.

MIX96		5PM-6PM	Thursday July 5, 2007
Teri Lynn			
0:00	02056	Donna Summer BAD GIRLS	:12/3:55/FADE
3:55	02370	THE FRAY HOW TO SAVE A LIFE	07/4:20/COLD
8:15	00011	PHIL COLLINS TAKE ME HOME	:24/5:38/FADE
13:53	01843	CHRISTINA AGUILERA FIGHTER	:10/4:05/COLD
17:58	02261	BOB SEGER WAIT FOR ME	18/3:35/FADE
21:33	02080	MAROON 5 SHE WILL BE LOVED	:10/4:14/FADE
25:47	00779	ROD STEWART SO FAR AWAY	:13/4:11/FADE
29:58	01451	PINK MOST GIRLS	:09/4:00/FADE
33:58	02378	SNOW PATROL CHASING CARS	06/4:23/COLD
38:21		STOP SET	1:00 (Sweep: 38:21)
39:21	00871	LOU BEGA MAMBO #5	COLD/3:37/COLD
42:58	02235	NICK LACHEY WHAT'S LEFT OF ME	13/4:00/COLD
46:58	01903	FLEETWOOD MAC DON'T STOP	:17/3:06/FADE
50:04	02229	NATASHA BEDDINGFILELD UNWRITTEN	12/3:43/FADE
53:47		STOP SET	4:00 (Sweep: 14:26)
57:47	01605	MODERN ENGLISH I MELT WITH YOU	:13/3:52/FADE

FIGURE 4.3
RADIO PROGRAM LOG FOR AN ADULT CONTEMPORARY (AC) STATION
Source: KCVM, Cedar Falls, IA, 2007.

Critics of format radio argued that only the top songs received play and that lesser-known songs deserving air time received meager attention. Although a few popular star deejays continued to play a role in programming, many others quit when managers introduced formats. Owners approached programming as a science, but deejays considered it an art form. Program managers argued that deejays had different tastes than the average listener and therefore could not be fully trusted to know popular audience tastes. The owners' position, which generated more revenue, triumphed.

Resisting the Top 40

The expansion of FM in the mid-1960s created room for experimenting, particularly with classical music, jazz, blues, and non-Top 40 rock songs. **Progressive rock** emerged as an alternative to conventional formats. Many noncommercial stations broadcast from college campuses, where student deejays and managers rejected the commercialism associated with Top 40 tunes and began playing lesser-known alternative music and longer album cuts (such as Bob Dylan's "Desolation Row" and The Doors' "Light My Fire"). Until that time, most rock on radio had been consigned almost exclusively to Top 40 AM formats, with song length averaging about three minutes.

Experimental FM stations, both commercial and noncommercial, offered a cultural space for hard-edged political folk music and for rock music that commented on the Civil Rights movement and protested America's involvement in the Vietnam War. By the 1970s, however, progressive rock had been copied, tamed, and absorbed by mainstream radio under the format labeled **album-oriented rock (AOR)**. By 1972, AOR-driven album sales accounted for more than 85 percent of the retail record business. By the 1980s, as first-generation rock and rollers aged and became more affluent, AOR stations became less political and played mostly white, post-Beatles music featuring such groups as Pink Floyd, Led Zeppelin, Cream, and Queen.[15] Today, AOR has been subsumed under the more general classic rock format.

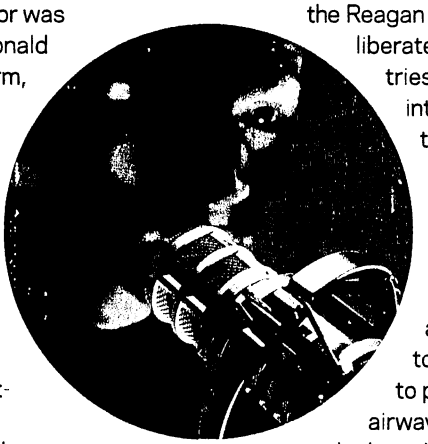
CASE STUDY

Host: The Origins of Talk Radio

by David Foster Wallace

The origins of contemporary political talk radio can be traced to three phenomena of the 1980s. The first of these involved AM music stations getting absolutely murdered by FM, which could broadcast music in stereo and allowed for much better fidelity on high and low notes. The human voice, on the other hand, is mid-range and doesn't require high fidelity. The eighties' proliferation of talk formats on the AM band also provided new careers for some music deejays—e.g., Don Imus, Morton Downey Jr.—whose chatty personas didn't fit well with FM's all-about-the-music ethos.

The second big factor was the repeal, late in Ronald Reagan's second term, of what was known as the Fairness Doctrine. This was a 1949 FCC rule designed to minimize any possible restrictions on free speech caused by limited access to broadcasting outlets. The idea was that, as one of the conditions for receiving an FCC broadcast license, a station had to "devote reasonable attention to the coverage of controversial issues of public importance," and consequently had to provide "reasonable, although not necessarily equal" opportunities for opposing sides to express their views. Because of the Fairness Doctrine, talk stations had to hire and program symmetrically: if you had a three-hour program whose host's politics were on one side of the ideological spectrum, you had to have another long-form program whose host more or less spoke for the other side. Weirdly enough, up through the mid-eighties it was usually the U.S. right that benefited most from the Doctrine. Pioneer talk syndicator Ed McLaughlin, who managed San Francisco's KGO in the 1960s, recalls that "I had more liberals on the air than I had conservatives or even moderates for that matter, and I had a hell of a time finding the other voice."



The Fairness Doctrine's repeal was part of the sweeping deregulations of the Reagan era, which aimed to liberate all sorts of industries from government interference and allow them to compete freely in the marketplace. The old, Rooseveltian logic of the Doctrine had been that since the airwaves belonged to everyone, a license to profit from those airwaves conferred on the broadcast industry some special obligation to serve the public interest. Commercial radio broadcasting was not, in other words, originally conceived as just another for-profit industry; it was supposed to meet a higher standard of social responsibility. After 1987, though, just another industry is pretty much what radio became, and its only real responsibility now is to attract and retain listeners in order to generate revenue. In other words, the sort of distinction explicitly drawn by FCC Chairman Newton Minow in the 1960s—namely, that between "the public interest" and "merely what interests the public"—no longer exists.

More or less on the heels of the Fairness Doctrine's repeal came the West Coast and then national syndication of *The Rush Limbaugh Show* through Mr. McLaughlin's EFM Media. Limbaugh is the third great progenitor of today's political talk radio partly because he's a host of extraordinary, once-in-a-generation talent and charisma—bright, loquacious, witty, complexly authoritative—whose show's blend of news, entertainment, and partisan analysis became the model for legions of imitators. But he was also the first great promulgator of the Mainstream Media's Liberal Bias idea. This turned out to be a brilliantly effective rhetorical move, since the MMLB concept functioned simultaneously as a standard around which Rush's audience could rally, as an articulation of the need for right-wing (i.e., unbiased) media, and as a mechanism by which any criticism or refutation of conservative ideas could be dismissed (either as biased or as the product of indoctrination by biased media). Boiled way down, the MMLB thesis is able both to exploit and to perpetuate many conservatives' dissatisfaction with extant media sources—and it's this dissatisfaction that cements political talk radio's large and loyal audience.

Source: Excerpted from David Foster Wallace, "Host: The Origins of Talk Radio," Atlantic, April 2005, 66-68.

The Sounds of Commercial Radio

Contemporary radio sounds very different from its predecessor. In contrast to the few stations per market in the 1930s, most large markets today include more than forty stations that vie for listener loyalty. With the exception of national network-sponsored news segments and nationally syndicated programs, most programming is locally produced and heavily dependent on the music industry for content. Although a few radio personalities, such as Howard Stern, Adam Corolla, Rush Limbaugh, Tom Joyner, Dr. Laura Schlessinger, Tavis Smiley, and Jim Rome, are nationally prominent, local deejays and their music are the stars at most radio stations.

However, listeners today are unlike radio's first audiences in several ways. First, listeners in the 1930s tuned in their favorite shows at set times. Listeners today do not say, "Gee, my favorite song is coming on at 8 P.M., so I'd better be home to listen." Instead, radio has become a secondary, or background, medium that follows the rhythms of daily life. Radio programmers today worry about channel cruising–listeners' tendency to search the dial until they find a song they like.

Second, in the 1930s, peak listening time occurred during evening hours–dubbed *prime time* in the TV era–when people were home from work and school. Now, the heaviest radio listening occurs during **drive time**, between 6 and 9 A.M. and 4 and 7 P.M., when people are commuting to and from work or school.

Third, stations today are more specialized. Listeners are loyal to favorite stations, music formats, and even radio personalities, rather than to specific shows. People generally listen to only four or five stations that target them. Nearly fourteen thousand radio stations now operate in the United States, customizing their sounds to reach niche audiences through format specialization and alternative programming.

RYAN SEACREST may be best known for his job hosting TV's *American Idol*, but he began his career in radio when he hosted a local radio show while attending the University of Georgia. In the style of his own idols—Dick Clark and Casey Kasem—Seacrest now hosts two nationally syndicated radio shows, *On Air with Ryan Seacrest* and *American Top 40*, in addition to his television projects.

Format Specialization

Stations today use a variety of formats based on managed program logs and day parts. All told, more than forty different radio formats, plus variations, serve diverse groups of listeners. (See Figure 4.4 on page 130.) To please advertisers, who want to know exactly who is listening, formats usually target audiences according to their age, income, gender, or race/ethnicity. Radio's specialization enables advertisers to reach smaller target audiences at costs that are much lower than those for television.

Targeting listeners has become extremely competitive, however, because forty or fifty stations may be available in a large radio market. In the last decade, according to the Center for Radio Information, more than one thousand stations a year (roughly 10 percent of all stations) switched formats in an effort to find the formula that would generate more advertising money. Some stations, particularly those in large cities, even rent blocks of time to various local ethnic or civic groups; this enables the groups to dictate their own formats and sell ads.

News and Talk Radio

The nation's fastest-growing format throughout much of the 1990s was the **news/talk format** (see "Case Study–Host: The Origins of Talk Radio" on page 128). In 1987, only 170 radio stations operated formats dominated by either news programs or talk shows, which tend to appeal to adults over age thirty-five (except for sports talk programs, which draw mostly male sports fans of all ages). Buoyed by the notoriety and popularity of personalities like Tavis Smiley and Rush

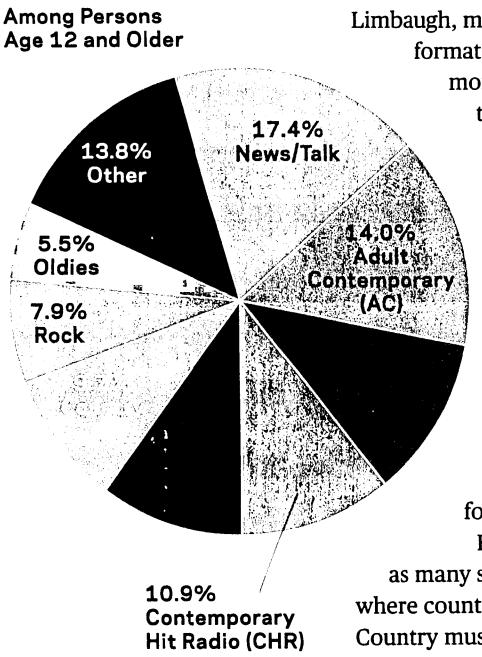


FIGURE 4.4

MOST POPULAR RADIO FORMATS IN THE UNITED STATES

Source: Arbitron, American Radio Listening Trends, Spring 2007.

Limbaugh, more than 1,300 stations used the format by 2009, making it the most popular format (by number of listeners) in the nation. (See Table 4.2.) A news/talk format, though more expensive to produce than a music format, appeals to advertisers looking to target working- and middle-class adult consumers. Nevertheless, most radio stations continue to be driven by a variety of less expensive music formats.

Music Formats

The **adult contemporary (AC)** format, also known as middle-of-the-road or MOR, is among radio's oldest and most popular formats, reaching about 14 percent of all listeners, most of them older than forty, with an eclectic mix of news, talk, oldies, and soft rock music–what *Broadcasting* magazine describes as "not too soft, not too loud, not too fast, not too slow, not too hard, not too lush, not too old, not too new." Now encompassing everything from rap to pop punk songs, Top 40 radio–also called **contemporary hit radio (CHR)**–still appeals to many teens and young adults. Since the mid-1980s, however, these stations have lost ground steadily as younger generations have followed music first on MTV and now online rather than on radio.

By far, **country** claims the most stations–more than two thousand, nearly twice as many stations as those with the news/talk format. Many stations are in tiny markets where country is traditionally the default format for communities with only one radio station. Country music has old roots in radio, starting in 1925 with the influential Grand Ole Opry program on WSM in Nashville. Although Top 40 drove country music out of many radio markets in the 1950s, the growth of FM in the 1960s brought it back, as station managers looked for market niches not served by rock music. As diverse as rock music, country today includes such subdivisions as old-time, progressive country, country-rock, western swing, and country-gospel.

Many formats appeal to particular ethnic or racial groups. In 1947, WDIA in Memphis was the first station to program exclusively for black listeners. Now called **urban**, this format

TABLE 4.2

TALK RADIO WEEKLY AUDIENCE (IN MILLIONS)

Source: Talkers *magazine, "Top Talk Radio Audiences," Spring 2009.*

Note: * = Information unavailable; N/A = Talk host not nationally broadcast.

Talk Show Host	2003	2006	2009
Rush Limbaugh (Conservative)	14.5	13.5	15.00
Sean Hannity (Conservative)	11.75	12.5	14.00
Glenn Beck (Conservative)	*	3	9.00
Michael Savage (Conservative)	7	8.25	9.00
Dr. Laura Schlessinger (General Advice)	8.5	8	9.00
Laura Ingraham (Conservative)	1.25	5	6.25
Mark Levin (Conservative)	N/A	1	6.25
Dave Ramsey (Financial Advice)	*	2.75	6.25
Neal Boortz (Conservative)	2.5	3.75	4.75
Mike Gallagher (Conservative)	2.5	3.75	4.75
Michael Medved (Conservative)	*	2.25	4.75
Jim Bohannon (Ind. / Moderate)	4	3.25	3.75
Doug Stephan (Ind. / Moderate)	2	3.25	3.75
Bill Bennett (Conservative)	N/A	*	3.50
Jerry Doyle (Conservative)	*	*	3.50
Clark Howard (Consumer Advocacy)	2.5	3.25	3.50

EDDIE "PIOLÍN" SOTELO is a popular Los Angeles radio personality on Univision-owned KSCA (101.9 FM), which has a regional Mexican format and is the highest-rated station in the market. Sotelo is a major supporter of immigrant rights and helped to organize a huge rally in 2006.

targets a wide variety of African American listeners, primarily in large cities. Urban, which typically plays popular dance, rap, R&B, and hip-hop music (featuring performers like Rihanna and Kanye West), also subdivides by age, featuring an Urban AC category with performers like Mario, Fantasia, and Mary J. Blige.

Spanish-language radio, one of radio's fastest-growing formats, is concentrated mostly in large Hispanic markets such as Miami, New York, Chicago, Las Vegas, California, Arizona, New Mexico, and Texas (where KCOR, the first all-Spanish-language station, originated in San Antonio in 1947). Besides talk shows and news segments in Spanish, this format features a variety of Spanish, Caribbean, and Latin American musical styles, including calypso, flamenco, mariachi, merengue, reggae, samba, salsa, and Tejano.

In addition, today there are other formats that are spin-offs from AOR. Classic rock serves up rock favorites from the mid-1960s through the 1980s to the baby-boom generation and other listeners who have outgrown the Top 40. The oldies format originally served adults who grew up on 1950s and early 1960s rock and roll. As that audience has aged, oldies formats now target younger audiences by featuring hits from the 1970s and 1980s. The alternative music format recaptures some of the experimental approach of the FM stations of the 1960s, although with much more controlled playlists, and has helped to introduce artists such as the Dead Weather and Japandroids.

Research indicates that most people identify closely with the music they listened to as adolescents and young adults. This tendency partially explains why oldies and classic rock stations combined have surpassed Top 40 stations today. It also helps to explain the recent nostalgia for music from the 1980s and early 1990s.

Nonprofit Radio and NPR

Although commercial radio (particularly those stations owned by huge radio conglomerates) dominates the radio spectrum, nonprofit radio maintains a voice. But the road to viability for nonprofit radio in the United States has not been easy. In the 1930s, the Wagner-Hatfield Amendment to the 1934 Communications Act intended to set aside 25 percent of radio for a

"NPR has transformed itself from rag-tag alternative radio into a mainstream news powerhouse with more bureaus worldwide than the *Washington Post* and 26 million listeners a week—twice as many as a decade ago."

WASHINGTONIAN, 2007

"We have a huge responsibility to keep the airwaves open for what I think is the majority—representing the voices that are locked out of the mainstream media."

AMY GOODMAN, CO-HOST OF RADIO'S *DEMOCRACY NOW!* 2001

wide variety of nonprofit stations. When the amendment was defeated in 1935, the future of educational and noncommercial radio looked bleak. Many nonprofits had sold out to for-profit owners during the Great Depression of the 1930s. The stations that remained were often banished from the air during the evening hours or assigned weak signals by federal regulators who favored commercial owners and their lobbying agents. Still, nonprofit public radio survived. Today, more than three thousand nonprofit stations operate, most of them on the FM band.

The Early Years of Nonprofit Radio

Two government rulings, both in 1948, aided nonprofit radio. First, the government began authorizing noncommercial licenses to stations not affiliated with a labor, religion, education, or civic group. The first license went to Lewis Kimball Hill, a radio reporter and pacifist during World War II who started the **Pacifica Foundation** to run experimental public stations. Pacifica stations, like Hill, have often challenged the status quo in radio as well as in government. Most notably, in the 1950s they aired the poetry, prose, and music of performers considered radical, left-wing, or communist who were blacklisted by television and seldom acknowledged by AM stations. Over the years, Pacifica has also been fined and reprimanded by the FCC and Congress for airing programs that critics considered inappropriate for public airwaves. Today, Pacifica has about ninety affiliate stations.

MICHELE NORRIS is one of the hosts on NPR's *All Things Considered*, a daily news show that features a "trademark mix of news, interviews, commentaries, reviews and offbeat features." *All Things Considered* has been on the air since 1971 and is one of NPR's most popular programs.

Second, the FCC approved 10-watt FM stations. Prior to this time, radio stations had to have at least 250 watts to get licensed. A 10-watt station with a broadcast range of only about seven miles took very little capital to operate, so more people could participate, and they became training sites for students interested in broadcasting. Although the FCC stopped licensing new 10-watt stations in 1978, about one hundred longtime 10-watters are still in operation.

Creation of the First Noncommercial Networks

During the 1960s, nonprofit broadcasting found a Congress sympathetic to an old idea: using radio and television as educational tools. As a result, **National Public Radio (NPR)** and the **Public Broadcasting Service (PBS)** were created as the first noncommercial networks. Under the provisions of the **Public Broadcasting Act of 1967** and the **Corporation for Public Broadcasting (CPB)**, NPR and PBS were mandated to provide alternatives to commercial broadcasting. Now, NPR's popular news and interview programs, *Morning Edition* and *All Things Considered*, are thriving, and each draws more than thirteen million listeners per week. Over the years, however, more time and attention have been devoted to public television than to public radio. When government funding tightened in the late 1980s and 1990s, television received the lion's share. In 1994, a conservative majority in Congress cut financial support and threatened to scrap the CPB, the funding authority for public broadcasting. Consequently, stations became more reliant on private donations and corporate sponsorship. While depending on handouts, especially from big business, public broadcasters steered clear of some controversial subjects, especially those that critically examined corporations. (See "Media Literacy and the Critical Process: Comparing Commercial and Noncommercial Radio" on page 133.)

Like commercial stations, nonprofit radio has adopted the format style. Unlike commercial radio, however, the dominant style in public radio is a loose variety format whereby a station may actually switch from jazz, classical music, and alternative rock to news and talk during different parts of the day. Noncommercial radio remains the place for both tradition and experimentation, as well as for programs that do not draw enough listeners for commercial success.

Media Literacy and the Critical Process

1 DESCRIPTION. Listen to a typical morning or late afternoon hour of a popular local commercial talk-news radio station and a typical hour of your local NPR station, from the same time period over a two- to three-day period. Keep a log of what topics are covered and what news stories are reported. For the commercial station, log what commercials are carried and how much time in an hour is devoted to ads. For the noncommercial station, note how much time is devoted to recognizing the station's sources of funding support and who the supporters are.

2 ANALYSIS. Look for patterns. What kinds of stories are covered? What kinds of topics are discussed? Create a chart to categorize the stories. To cover events and issues, do the stations use actual reporters at the scene? How much time is given to reporting compared to time devoted to opinion? How many sources are cited in each story? What kinds of interview sources are used? Are they expert sources or regular person-on-the-street interviews? How many sources are men and how many are women?

Comparing Commercial and Noncommercial Radio

After the arrival and growth of commercial TV, the Corporation for Public Broadcasting (CPB) was created in 1967 as the funding agent for public broadcasting—an alternative to commercial TV and radio for educational and cultural programming that could not be easily sustained by commercial broadcasters in search of large general audiences. As a result, NPR (National Public Radio) developed to provide national programming to public stations to supplement local programming efforts. Today, NPR affiliates get as little as 2 percent of their funding from the government. Most money for public radio comes instead from corporate sponsorships, individual grants, and private donations.

3 INTERPRETATION. What do these patterns mean? Is there a balance between reporting and opinion? Do you detect any bias, and if so, how did you determine this? Are the stations serving as watchdogs to ensure that democracy's best interests are being served? What effect, if any, do you think the advertisers/supporters have on the programming? What arguments might you make about commercial and noncommercial radio based on your findings?

4 EVALUATION. Which station seems to be doing a better job serving its local audience? Why? Do you buy the 1930s argument that noncommercial stations serve narrow, special interests while commercial stations serve capitalism and the public interest? Why or why not? From which station did you learn the most, and which station did you find most entertaining? Explain. What did you like and dislike about each station?

5 ENGAGEMENT. Contact the local general manager, program director, or news director at the stations you analyzed. Ask them what their goals are for a typical hour of programming and what audience they are trying to reach. Incorporate their comments into a report on your findings. Finally, offer suggestions on how to make the programming at each station better.

Radio Goes Digital

Over the past decade or so, four alternative radio technologies have helped bring more diverse sounds to listeners: the Internet, satellite, podcasts, and HD (digital) radio.

Internet Radio

Internet radio emerged in the 1990s with the popularity of the Web. Internet radio stations come in two types: An existing station may "stream" a simulcast version of its on-air signal over the Web, or a station may be created exclusively for the Internet. Some of the most popular Internet radio stations are those that carry music formats unavailable on local radio, such as jazz, blues, and New Age music. Beginning in 2002, a Copyright Royalty Board established by the Library of Congress began to assess royalty fees based on a percentage of each station's revenue for the right to stream copyrighted songs over the Internet. In 2007, the board proposed to change the royalty fees to a per-song basis, which would increase station payments to

HOWARD STERN'S broadcast radio show held the record for indecency fines when he moved to satellite radio in 2006. Although Stern is now completely uncensored, the lack of FCC notoriety and a limited ability to reach listeners has made Stern a less visible figure in the media.

the recording industry anywhere from 300 to 1,200 percent. Although the recording industry was pleased with the plan, Webcasters–who have more than 42 million online listeners each week–claimed the higher rates threatened their financial viability.[16] In 2009, Congress passed the Webcaster Settlement Act, which was considered a lifeline for Internet radio. The act enabled Internet stations to negotiate royalty fees directly with the music industry, at rates presumably more reasonable for Webcasters than what the Copyright Royalty Board had proposed.

Satellite Radio

Another alternative radio technology added a third band–**satellite radio**–to AM and FM. Two services, XM and Sirius, completed their national introduction by 2002 and now offer more than one hundred digital music, news, and talk channels to the continental United States via satellite, at monthly prices starting at $12.95 and satellite radio receivers costing from $15 to $350. Programming includes a range of music channels, from rock to reggae, to Spanish Top 40 and opera, as well as channels dedicated to NASCAR, NPR, cooking, and comedy. Another feature of satellite radio's programming is popular personalities who host their own shows or have their own channels, including Howard Stern, Martha Stewart, Oprah Winfrey, and Bob Dylan. In 2002, U.S. automakers (investors in the satellite radio companies) began equipping most new cars with a satellite band, in addition to AM and FM, helping to ensure the adoption of satellite radio.

Both services struggled to make a profit as they built competing satellite systems and battled for listeners. In 2008, they merged to form Sirius XM Radio despite complaints from the traditional terrestrial radio industry that a merger would create an illegal noncompetitive monopoly in satellite radio. Sirius and XM countered that because they compete with all kinds of audio entertainment–radio, Webcasters, and podcasts–there was still plenty of competition in the market. However, postmerger satellite radio continues to have financial problems.

Podcasting

Developed in 2004, **podcasting** (the term marries "iPod" and "broadcasting") refers to the practice of making audio files available on the Internet so listeners can download them onto their computers and transfer them to portable MP3 players or listen to the files on the computer. This popular distribution method quickly became mainstream, as mass media companies created commercial podcasts to promote and extend existing content, such as news and reality TV, while independent producers kept pace with their own podcasts on niche topics like knitting, fly fishing, and learning Russian.

HD Radio

Available to the public since 2004, **HD radio** is a digital technology that enables AM and FM radio broadcasters to multicast two to three additional compressed digital signals within their traditional analog frequency. For example, KNOW, a public radio station at 91.1 FM in Minneapolis-St. Paul, runs its National Public Radio news format on 91.1 HD1, BBC News on 91.1 HD2, and the BBC Mundo Spanish language news service on 91.1 HD3. More than fifteen hundred radio stations now broadcast in HD. To tune in, listeners need a radio with the HD band. (For more on HD radio, see "Tracking Technology: HD Radio" on the next page.)

TRACKING TECHNOLOGY

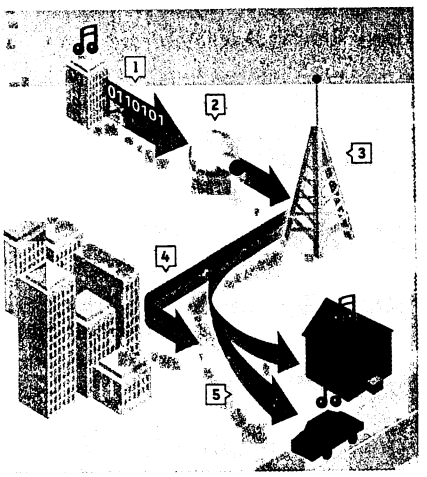
HD Radio

by Marc Fisher

Chasing an audience that has migrated to iPods, Internet radio, pay satellite services and the burgeoning world of cellphone music, the AM and FM radio industry has spent the past couple of years beckoning listeners to discover the "secret stations" of HD radio.

HD radio—the abbreviation summons the TV term "high-definition" but actually stands for "hybrid digital"—is a technology designed to offer clearer sound and a way to add extra signals onto existing broadcast frequencies. (On an HD radio, you turn the tuning dial one notch up from the regular FM frequency and the second channel appears.)

Along with providing a free alternative to the broader array of music available on the pay XM and Sirius satellite services, HD's promise is to push the pendulum back from the extreme narrowing of choice that swept through radio in the 1990s. And so [a station] can supplement its regular light-rock format with an HD channel of nothing but love songs. Or, on [a station] that plays current country hits, its HD channel is devoted to classic country numbers.



HOW HD RADIO WORKS
(1) The radio station sends the analog and digital AM or FM signals out simultaneously. (2) The digital signal is compressed, so it takes up less bandwidth. (3) The radio tower transmits the combined analog and digital signals. (4) HD signals are designed to filter through reflected signals and reduce fading, static, hisses, and pops. (5) Older radios receive only the analog signal. New HD radio receivers pick up the CD-quality digital AM or FM signals.

But for all the hype about HD, are people listening? Even after the biggest ad campaign anywhere on radio—with more ad spots than Geico, Budweiser or General Motors last year—the answer is not many, according to the latest estimates.

When Bridge Ratings, a radio consulting company, conducted a survey about HD, it found that 75 percent of respondents have heard of the new technology, thanks to radio's aggressive ad campaign. But only 13 percent of the sample could say what HD radio is, and only 7 percent expressed interest in owning an HD set.

Bridge projects slow, poor growth for HD, especially compared with the galloping interest in Web and cellphone radio. "New cell phone capabilities which will turn the mobile phone into a more dynamic part of daily life will potentially surpass Internet radio as the most significant challenger to traditional radio," Bridge concluded.

Bob Struble, president of iBiquity, the Columbia-based company that developed the HD technology, disagrees. With Circuit City and Best Buy adding HD radios to their product line, and Ford and Volvo installing HD radios in their cars, he sees a brighter future. "We're still early in the game," Struble says. The company won't say how many HD radios have been sold, but industry observers put the figure at fewer than 500,000.

The slow adoption is the main reason some stations have not added HD-only programming. "It's still an evolving technology," says Dan DeVany, general manager of WETA (90.9 FM) [Washington, D.C.], a public classical music station, which has no extra HD channel. "I'd like to see more of those units sold before we'd plan anything."

The chicken-egg question for HD radio is whether stations should invest in new programming now to lure new listeners or after an audience develops. And if stations wait, why would anyone invest in a new radio?

"You're onto something there," Struble says. "The initial push was around the basic concept—there's a lot more out there. But there's a very important role to be played by individual stations." He hopes more stations will do as Baltimore's 98 Rock does, giving listeners of the indie-rock station a taste of its classic-rock HD station for four hours every Sunday morning.

But far from pushing their HD offerings, most stations seem only half-heartedly invested in the technology. HD remains a promising technology, but so far, many more people listen to the new programming via online streaming than on an HD radio. Listeners are voting with their ears, and they're choosing Web-based and mobile audio, in part because most HD radio programming just isn't compelling enough to lure people to a different gadget. ◢

Excerpted from: Marc Fisher, "HD: If a Tree Falls & No One Hears It . . . ," Washington Post, February 10, 2008, p. M05.

"Just as TiVo ensured that there'd always be something to watch when you get home, [podcasting and] podcasters fill your computer with interesting music and radio-style talk shows from around the world. Unlike TiVo, though, podcast subscriptions . . . are still free, and anyone with an Internet connection can create a show."

DAVID BATTINO, *ELECTRONIC MUSICIAN*, 2005

The Economics of Broadcast Radio

Radio continues to be one of the most-used mass media, reaching 92 percent of American teenagers and adults every week.[17] Because of radio's broad reach, the airwaves are very desirable real estate for advertisers, who want to reach people in and out of their homes; for record labels, who want their songs played; and for radio station owners, who want to create large radio groups to dominate multiple markets.

Local and National Advertising

About 8 percent of all U.S. spending on media advertising goes to radio stations. Like newspapers, radio generates its largest profits by selling local and regional ads. Thirty-second radio spot ads range from $1,500 in large markets to just a few dollars in the smallest markets. Today, gross advertising receipts for radio are more than $19.5 billion (about three-quarters of the revenues from local ad sales, with the remainder in national spot and network sales), up from about $12.4 billion in 1996. The industry is economically healthy, with approximately 14,250 stations (almost 4,800 AM stations, about 6,400 FM commercial stations, and about 3,000 FM educational stations). Unlike television, where nearly 40 percent of a station's expenses goes to buy syndicated programs, local radio stations get much of their content free from the recording industry. Therefore, only about 20 percent of a typical radio station's budget goes to cover programming costs.

When radio stations want to purchase programming, they often turn to national network radio, which generates more than $1.2 billion in ad sales annually by offering dozens of specialized services. For example, Westwood One, the nation's largest radio network service, managed by CBS Radio, syndicates more than 150 programs, including regular news features (e.g., CBS Radio News, CNN Radio News), entertainment programs (e.g., *Country Countdown USA*, *Saturday Night All Request 80s*), talk shows (e.g., the *Dennis Miller Show*, *Loveline*), and complete twenty-four-hour formats (e.g., adult rock and roll, bright adult contemporary, hot country, mainstream country, and CNN Headline News). More than sixty companies offer national program and format services, typically providing local stations with programming in exchange for time slots for national ads. The most successful radio network programs are the shows broadcast by affiliates in the Top 20 markets, which offer advertisers half of the country's radio audience.

TABLE 4.3
TOP RADIO INDUSTRY COMPANIES, 2008

*Dollars in millions.

Source: "100 Leading Media Companies," Advertising Age, http://adage.com/datacenter/datapopup.php?article_id=139407.

Rank	Company	Radio Net Revenue*
1	Clear Channel Communications (Top Property: WLTW-FM, New York)	$3,294
2	Sirius XM Satellite Radio (Satellite Radio)	2,317
3	CBS Corp. (KROQ-FM, Los Angeles)	1,532
4	Citadel Broadcasting Corp. (WPLJ-FM, New York)	861
5	Cumulus Media (KNBR-AM, San Francisco)	524
6	Entercom Communications Corp. (WEEI-AM, Boston)	440
7	Univision Communications (KLVE-FM, Los Angeles)	414
8	Cox Enterprises (WSB-AM, Atlanta)	410
9	Westwood One (supplies programming to stations)	404
10	Walt Disney Co. (Radio Disney)	144

Manipulating Playlists with Payola

Radio's impact on music industry profits–radio airplay can help to popularize recordings–has required ongoing government oversight to expose illegal playlist manipulation. **Payola**, the practice by which record promoters pay deejays to play particular records, was rampant during the 1950s as record companies sought to guarantee record sales (see Chapter 3). In response, management took control of programming, arguing that if individual deejays had less impact on which records would be played, the deejays would be less susceptible to bribery.

Despite congressional hearings and new regulations, payola persisted. Record promoters showered their favors on a few influential, high-profile deejays, whose backing could make or break a record nationally, or on key program managers in charge of Top 40 formats in large urban markets. Although a 1984 congressional hearing determined that there was "no credible evidence" of payola, NBC News broke a story in 1986 about independent promoters who had alleged ties to organized crime. A subsequent investigation led major recording companies to break most of their ties with independent promoters. Prominent record labels had been paying such promoters up to $80 million per year to help records become hits.

Recently, there has been increased enforcement of payola laws. In 2005, two major labels–Sony-BMG and Warner Music–paid $10 million and $5 million, respectively, to settle payola cases in New York State, where label executives were discovered bribing radio station programmers to play particular songs. A year later, New York went after radio chain Entercom Communications "for soliciting money and gifts from record companies in exchange for playing songs." Evidence revealed a 2003 e-mail from a Buffalo, New York, pop music station owned by Entercom to an executive at Columbia Records: "Do you need help on Jessica [Simpson] this week? 1250? If you don't need help, I certainly don't need to play it."[18] And in 2007, four of the largest broadcasting companies–CBS Radio, Clear Channel, Citadel, and Entercom–agreed to pay $12.5 million to settle an FCC payola investigation. The companies also agreed to an unprecedented "independent music content commitment," which requires them to provide eighty-four hundred half-hour blocks of airtime to play music from independent record labels.

A controversial and "legal" alternative to payola emerged in 1998. **Pay-for-play** is a promotional strategy that typically involves up-front payments from record companies to radio stations to play a song a specific number of times.[19] Stations that use pay-for-play sidestep FCC regulations by broadcasting disclosures that state that the song has been paid for by the record company. In effect, the time to play the song is being purchased, not unlike the paid programming of television infomercials. If the station's listeners ultimately like the pay-for-play song, the song can become part of the station's regular, unsponsored lineup. Another form of pay-for-play involves a weekly, infomercial-like music program sponsored by a music label or department store that airs in several markets of a national radio chain. Although some see pay-for-play as a direct, honest way to introduce new music on radio stations, others object to having commercial interests blatantly tamper with playlists and the weekly Billboard music charts.

Radio Ownership: From Diversity to Consolidation

The **Telecommunications Act of 1996** substantially changed the rules concerning ownership of the public airwaves because the FCC eliminated most ownership restrictions on radio. As a result, some twenty-one hundred stations and $15 billion changed hands that year alone. From 1995 to 2005, the number of radio station owners declined by one-third, from sixty-six hundred to about forty-four hundred.[20]

Once upon a time, the FCC tried to encourage diversity in broadcast ownership. From the 1950s through the 1980s, a media company could not own more than seven AM, seven FM, and seven TV stations nationally, and only one radio station per market. Just prior to the 1996 act, the ownership rules were relaxed to allow any single person or company to own up to twenty AM, twenty FM, and twelve TV stations nationwide, but only two in the same market.

WHAT CLEAR CHANNEL OWNS

Radio Broadcasting (U.S.)
- 894 radio stations
- Premiere Radio Network (syndicates 90 radio programs, including *The Glenn Beck Program, Keep Hope Alive with Reverend Jesse Jackson, On Air with Ryan Seacrest,* and Fox Sports Radio)
- Format Lab

International Radio
- Clear Channel International Radio (Joint Partnerships)
  - Australian Radio Network
  - The Radio Network (New Zealand)
  - Grupo Acir (Mexico)

Advertising
- Clear Channel Outdoor Advertising (billboards, airports, malls, taxis)
  - North American Division
  - International Division

Media Representation
- Katz Media Group

Satellite Communications
- Clear Channel Satellite

Information Services
- Clear Channel Total Traffic Network
- Clear Channel Communications News Networks

Marketing/Video Production
- Twelve Creative

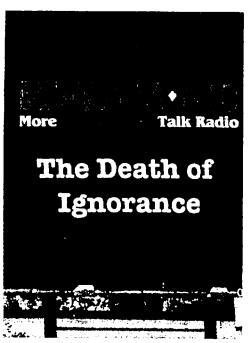
Broadcast Software
- RCS Sound Software

Radio Research and Consultation
- Broadcast Architecture

Trade Industry Publications
- InsideRadio.com
- TheRadioJournal.com
- *The Radio Book*

WHAT DOES THIS MEAN?

- Clear Channel has 22,100 full-time employees worldwide.[1]
- Clear Channel's 2008 revenue was $6.68 billion.
- Clear Channel's radio stations reach over 110 million people weekly.
- Radio broadcasting generates 49 percent of Clear Channel's revenue.
- Outdoor advertising represents 47 percent of Clear Channel's revenue.
- Clear Channel has 272 radio stations operating in the top 50 U.S. markets; 148 are in the top 25 markets.
- Clear Channel has outdoor advertising operations in 49 of the top 50 U.S. markets.
- Premiere Radio Network produces, distributes, or represents approximately ninety syndicated radio programs and services for approximately 5,000 radio stations. Syndicated program hosts include Rush Limbaugh, Sean Hannity, Elvis Duran, and Jeff Foxworthy.
- Clear Channel's Web sites host approximately 11.4 million unique visitors, making them one of the top 5 trafficked music sites.
- Clear Channel and its joint venture partners operate more than 240 radio stations in Australia, Mexico, and New Zealand.[2]



KFI-AM One of Clear Channel's major assets is KFI-AM, the dominant talk radio station in Los Angeles.

The 1996 act allows individuals and companies to acquire as many radio stations as they want, with relaxed restrictions on the number of stations a single broadcaster may own in the same city: The larger the market or area, the more stations a company may own within that market. For example, in areas where forty-five or more stations are available to listeners, a broadcaster may own up to eight stations, but not more than five of one type (AM or FM). In areas with fourteen or fewer stations, a broadcaster may own up to five stations (three of any one type). In very small markets with a handful of stations, a broadcast company may not own more than half the stations.

With few exceptions, for the past two decades the FCC has embraced the consolidation schemes pushed by the powerful National Association of Broadcasters (NAB) lobbyists in Washington, D.C., under which fewer and fewer owners control more and more of the airwaves.

The consequences of the 1996 Telecommunications Act and other deregulation have been significant. Consider the cases of Clear Channel Communications and CBS Radio, which are the two largest radio chain owners in terms of total revenue (see Table 4.3 on page 136). Clear Channel Communications was formed in 1972 with one San Antonio station. In 1998, it swallowed up Jacor Communications, the fifth-largest radio chain, and became the nation's second-largest group, with 454 stations in 101 cities. In 1999, Clear Channel gobbled up another growing conglomerate, AMFM (formerly Chancellor Media Corporation), which had 463 stations and an estimated $1.6 billion in revenue. The deal broadened Clear Channel's operation to 874 stations in 187 U.S. markets, providing access to more than 110 million listeners. By 2009, Clear Channel had shed some of the 1,205 stations it owned at its peak in 2005. Still, it owned nearly 900 radio stations and about 900,000 billboard and outdoor displays in the United States and around the world, and an interest in more than 240 stations internationally. Clear Channel also distributes many of the leading syndicated programs, including Dr. Laura, Rush Limbaugh, The Jim Rome Show, Ryan Seacrest, Delilah, and The Bob & Tom Show. (See "What Clear Channel Owns" on page 137.)

CBS Radio, formerly Infinity Broadcasting, was created when media giant Viacom split into two companies in late 2005. CBS Radio is the second leading radio conglomerate in terms of revenue, with 140 stations. It is also one of the leading outdoor advertising companies in the nation. Clear Channel and CBS Radio dominate the nation's top markets, with the majority of their stations located in the fifty largest markets.

CBS Radio also operates the Westwood One radio network, the nation's leading programming and radio news syndicator. Combined, Clear Channel and CBS own roughly 1,000 radio stations–about 7 percent of all commercial U.S. stations–and control about 24 percent of the entire radio industry's $19.5 billion revenue. Competing major radio groups that have grown in the recent radio industry consolidations include Cox, Entercom, Cumulus, Citadel, and Radio One. As a result of the consolidations permitted by deregulation, in most American cities, just two corporations dominate the radio market.

A smaller but perhaps the most dominant radio conglomerate in a single format area is Univision. With a $3 billion takeover of Hispanic Broadcasting in 2003, Univision is the top Spanish-language radio broadcaster in the United States. The company is also the largest Spanish-language television broadcaster in the United States (see Chapter 5), as well as being the owner of the top two Spanish-language cable networks (Galavisión and Telefutura) and Univision Online, the most popular Spanish-language Web site in the United States.

Alternative Voices

As large corporations gained control of America's radio airwaves, activists in hundreds of communities across the United States in the 1990s protested by starting up their own noncommercial "pirate" radio stations capable of broadcasting over a few miles with low-power FM signals of 1 to 10 watts. The NAB and other industry groups pressed to have the pirate broadcasters closed down, citing their illegality and their potential to create interference with existing stations. Between 1995 and 2000, more than five hundred illegal micropower radio stations

were shut down. Still, an estimated one hundred to one thousand pirate stations are in operation in the United States, in both large urban areas and small rural towns.

The major complaint of pirate radio station operators was that the FCC had long ago ceased licensing low-power community radio stations. In 2000 the FCC, responding to tens of thousands of inquiries about the development of a new local radio broadcasting service, approved a new noncommercial **low-power FM (LPFM)** class of 10- and 100-watt stations in order to give voice to local groups lacking access to the public airwaves. LPFM station licensees included mostly religious groups but also high schools, colleges and universities, Native American tribes, labor groups, and museums.

The technical plans for LPFM located the stations in unused frequencies on the FM dial. Still, the NAB and National Public Radio fought to delay and limit the number of LPFM stations, arguing that such stations would cause interference with existing full-power FM stations. Then FCC chairman William E. Kennard, who fostered the LPFM initiative, responded: "This is about the haves–the broadcast industry–trying to prevent many have-nots–small community and educational organizations–from having just a little piece of the pie. Just a little piece of the airwaves which belong to all of the people."[21] By 2009, more than 860 LPFM stations were broadcasting, and another 61 organizations had gained permission to build LPFM stations.

LOW-POWER FM RADIO
To help communities or organizations set up LPFM stations, some nonprofit groups like the Prometheus Radio Project provide support in obtaining government licenses as well as actually constructing stations. For construction endeavors known as "barn raisings," the Prometheus project will send volunteers "to raise the antenna mast, build the studio, and flip on the station switch." Shown above is the barn raising for station WRFU 104.5 FM in Urbana, Illinois.

Radio and the Democracy of the Airwaves

As the first national electronic mass medium, radio's influence in the formation of American culture cannot be overestimated. Radio has given us soap operas, situation comedies, and broadcast news; it helped to popularize rock and roll, car culture, and the politics of talk radio. Yet, for all of its national influence, broadcast radio is still a supremely local medium. For decades, listeners have tuned in to hear the familiar voices of their community's deejays and talk show hosts and hear the regional flavor of popular music over airwaves that the public owns.

The early debates over radio gave us one of the most important and enduring ideas in communication policy: a requirement to operate in the "public interest, convenience, or necessity." But the broadcasting industry has long been at odds with this policy, arguing that radio corporations invest heavily in technology and should be able to have more control over the radio frequencies on which they operate, and moreover own as many stations as they want. Deregulation in the past few decades has moved closer to that corporate vision, as nearly every radio market in the nation is dominated by a few owners, and those owners are required to renew their broadcasting licenses only every eight years.

This trend in ownership has moved radio away from its localism, as radio groups often manage hundreds of stations from afar. Given broadcasters' reluctance to publicly raise questions about their own economic arrangements, public debate regarding radio as a natural resource has remained minuscule. As citizens look to the future, a big question remains to be answered: With a few large broadcast companies now permitted to dominate radio ownership nationwide, how much is consolidation of power restricting the number and kinds of voices permitted to speak over public airwaves? To ensure that mass media industries continue to serve democracy and local communities, the public needs to play a role in developing the answer to this question.

CHAPTER REVIEW

REVIEW QUESTIONS

Early Technology and the Development of Radio

1. Why was the development of the telegraph important in media history? What were some of the disadvantages of telegraph technology?
2. How is the concept of the wireless different from that of radio?
3. What was Guglielmo Marconi's role in the development of the wireless?
4. What were Lee De Forest's contributions to radio?
5. Why were there so many patent disputes in the development of radio?
6. Why was the RCA monopoly formed?
7. How did broadcasting, unlike print media, come to be federally regulated?

The Evolution of Radio

8. What was AT&T's role in the early days of radio?
9. How did the radio networks develop? What were the contributions of David Sarnoff and William Paley to network radio?
10. Why did the government-sanctioned RCA monopoly end?
11. What is the significance of the Radio Act of 1927 and the Federal Communications Act of 1934?

Radio Reinvents Itself

12. How did radio adapt to the arrival of television?
13. What was Edwin Armstrong's role in the advancement of radio technology? Why did RCA hamper Armstrong's work?
14. How did music on radio change in the 1950s?
15. What is format radio, and why was it important to the survival of radio?

The Sounds of Commercial Radio

16. Why are there so many radio formats today?
17. Why did Top 40 radio diminish as a format in the 1980s and 1990s?
18. What is the state of nonprofit radio today?
19. How do Internet radio, satellite radio, podcasts, and HD radio present an alternative to standard broadcast radio?

The Economics of Broadcast Radio

20. What are the current ownership rules governing American radio?
21. What has been the main effect of the Telecommunications Act of 1996 on radio station ownership?
22. Why did the FCC create a new class of low-power FM stations?
23. Why did existing full-power radio broadcasters seek to delay and limit the emergence of low-power FM stations?

Radio and the Democracy of the Airwaves

24. Throughout the history of radio, why did the government encourage monopoly or oligopoly ownership of radio broadcasting?
25. What is the relevance of localism to debates about ownership in radio?

QUESTIONING THE MEDIA

1. Describe your earliest memories of listening to radio. Do you remember a favorite song? How old were you? Do you remember the station's call letters? Why did you listen?
2. Count the number and types of radio stations in your area today. What formats do they use? Do a little research and compare today's situation with the number and types of stations available in the 1930s and the 1950s. Describe the changes that have occurred.
3. If you could own and manage a commercial radio station, what format would you choose, and why?
4. If you ran a noncommercial radio station in your area, what services would you provide that are not being met by commercial format radio?
5. How might radio be used to improve social and political discussions in the United States?
6. If you were the head of a large radio group, what arguments would you make in response to charges that your company limited the number of voices in the local media?

For review quizzes, chapter summaries, links to media-related Web sites, and more, go to bedfordstmartins.com/mediaculture.

COMMON THREADS

One of the Common Threads in Chapter 1 discusses the development of the mass media. Like other mass media, radio evolved in three stages. But it also influenced an important dichotomy in mass media technology: wired versus wireless.

In radio's novelty stage, several inventors transcended the wires of the telegraph and telephone to solve the problem of wireless communication. In the entrepreneurial stage, inventors tested ship-to-shore radio, while others developed person-to-person toll radio transmissions and other schemes to make money from wireless communication. Finally, when radio stations began broadcasting to the general public (who bought radio receivers for their homes), radio became a mass medium.

As the first electronic mass medium, radio set the pattern for an ongoing battle between wired and wireless technologies. For example, television brought images to wireless broadcasting. Then cable television's wires brought television signals to places where receiving antennas didn't work. Satellite television (wireless from outer space) followed as an innovation to bring TV where cable didn't exist. Now, broadcast, cable, and satellite all compete against each other.

Similarly, think of how cell phones have eliminated millions of traditional phone, or land, lines. The Internet, like the telephone, also began with wires, but Wi-Fi and home wireless systems are eliminating those wires, too. And radio? Most listeners get traditional local (wireless) radio broadcast signals, but now listeners may use a wired Internet connection to receive Webcasts or podcasts.

Both wired and wireless technology have advantages and disadvantages. Do we want the stability but tethers of a wired connection? Or do we want the freedom and occasional instability ("Can you hear me now?") of wireless media? Can radio's development help us understand wired versus wireless battles in other media?

KEY TERMS

The definitions for the terms listed below can be found in the glossary at the end of the book. The page numbers listed with the terms indicate where the term is highlighted in the chapter.

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