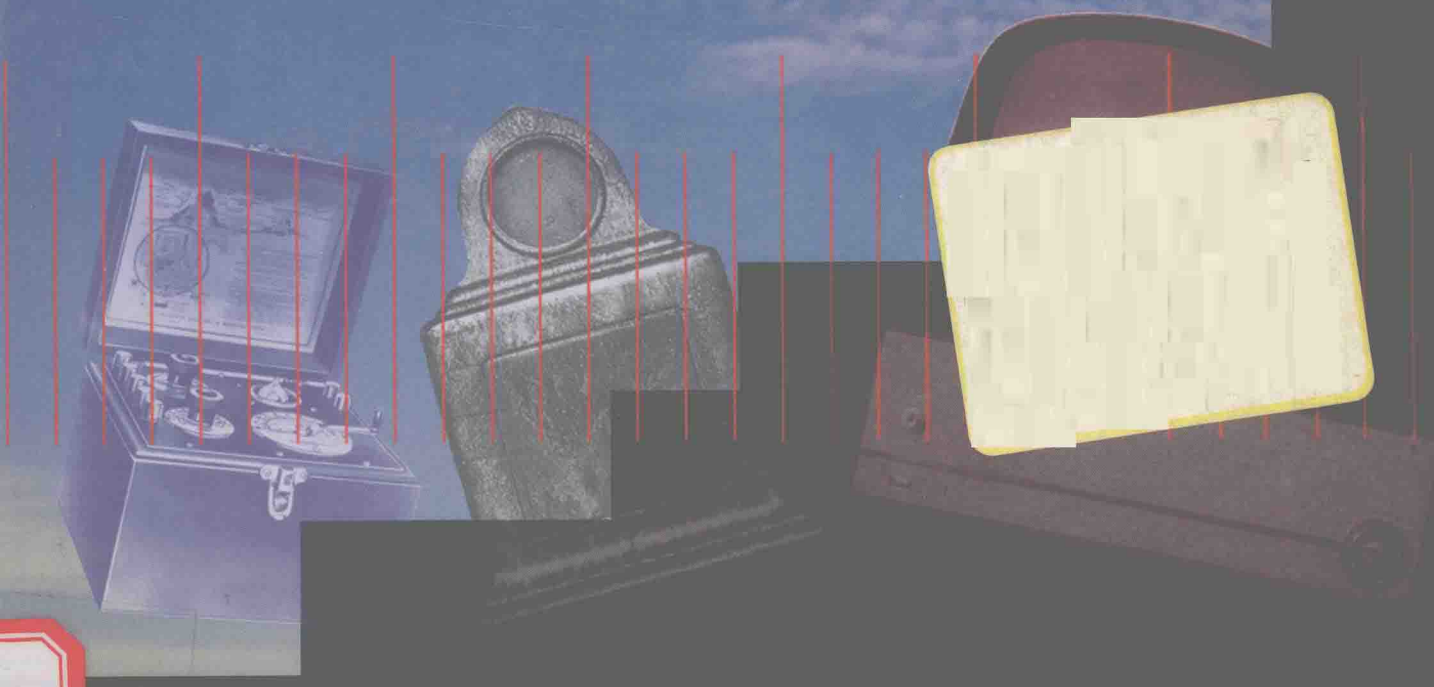
THE BROADCAST CENTURY

SECOND EDITION

A Biography of American Broadcasting



ROBERT L. HILLIARD • MICHAEL C. KEITH

The Broadcast Century, Second Edition

A Biography of American Broadcasting

Robert L. Hilliard / Michael C. Keith

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This book is dedicated to the people who made the history.
To quote Shakespeare, "Thank you for your voices,
thank you, your most sweet voices."

May it live and last for more than a century.
—Catullus, 87–54 B.C.

Preface

The three great revolutions of the twentieth century were the developments in energy, transportation, and communications. Of these, communications may be the most pervasive. When a revolution occurs in any country, what's the first thing taken over—the treasury? the educational institutions? the transportation system? the power plants? No, the radio and television stations. At no other time in history would the ideas and accomplishments of a generation of technical innovators so transform the future. Society and culture would not be the same after the introduction of "wireless" communication.

There is little question that the broadcast media are the most powerful forces in the world today for affecting the minds, emotions, and even the actions of humankind. Radio and television have awesome power—and awesome responsibility.

We have tried to address both. We are unabashedly prejudiced. We agree with the Congress of the United States in its establishing as the law of the land the concept that the airwaves belong to the people. We believe that broadcasting has a responsibility to serve the public interest, convenience, and necessity, as stated in the Communications Act of 1934. We do not hesitate to note when government, the broadcasting industry, advertisers, or pressure groups have attempted to usurp the people's right to uncensored news and the highest quality of entertainment, culture, education, information, and all the other format contents of which the media are capable.

For example, the principal source of news for most people in the United States is television. It is also the news medium they most trust. Television news coverage and documentaries are sometimes superb, contributing importantly to public knowledge. But we acknowledge, as well, that too often television (and radio) is a willing public relations purveyor for government or industry, rather than an objective, probing investigator seeking to find and tell the unvarnished truth and serve the people's right to know.

We are openly concerned with the power of the American media. When broadcasting is used to manipulate and control the public—as, for example, it has been in our electoral system by promoting some political candidates and ignoring others and emphasizing "sound bites" instead of substance, thus creating its chosen front-runners and winners—we have tried to show it.

Radio and television can educate, enlighten, and stimulate. When they have done so, they are excellent, and we have offered support and praise. Radio was initially thought of as a means of bringing into the home for the first time, live, education and culture from many distant sources. Now most radio stations survive only if they attract with popular entertainment enough of a fragmented local audience to warrant advertiser interest at profit-making rates. When the *New York Times* reported the first test of television, between Washington, D.C., and New York City in 1927, one of its subheadlines read "Commercial Use In Doubt." Senator Clarence Dill, coauthor of the Radio Act of 1927 and an important contributor to the Communications Act of 1934, wrote in 1938: "Television is the new use of radio that may become second only to sound broadcasting as a popular medium of entertainment and information. It will no doubt present many new problems in regulation."

FCC Chairman Newton Minow's 1961 description of television as a "vast wasteland" was mild compared with the harsher terms some critics later used, such as "national lobotomy machine" and "spawning a generation of videots, sonyclones, and couch potatoes." Nevertheless, television's potential for greatness and public service has been demonstrated with such dramatic series as "Roots" and "Holocaust" and its news and documentary coverage of such events as Watergate and moon landings. While we criticize its shortcomings, we know what broadcasting has been and can be, and we praise its achievements and encourage its expectations.

We make no pretense of possessing the erudition of Erik Barnouw, certainly America's foremost broadcast historian with his trilogy *A Tower in Babel, The Golden Web*, and *The Image Empire*. Nor do we pretend to compete with the collection of information and data in Christopher H. Sterling and John Michael Kittross's *Stay Tuned*. We have tried to provide an easily readable work, for the student and public alike, that deals with the key events, issues, and people in this first century of broadcasting that have altered forever the way we perceive the world.

You won't find in this book excessive nostalgic commentary on old favorite radio and television shows, or long listings of popular programs or performers. We are most interested in the relationship of broadcasting to the political, social, and economic environment of its times.

A current events "time line" and first-person "retro-box" accounts by people involved in the history of U.S. broadcasting help us do this.

We are grateful to those broadcast pioneers and current practitioners who generously offered advice and material. This is a better book because of their contributions, and it is to them that we also dedicate this book.

A Note On the Second Edition

This updated version of *The Broadcast Century* contains a number of corrections, revisions, and additions, which we believe improves on the original.

We are thankful to Focal Press for providing us with the opportunity to refine and update this text, and we owe a significant debt of gratitude to Elliot Sivowitch of the Smithsonian Institution and Christopher Sterling of George Washington University for their very generous comments and suggestions.

It should be noted, too, at the onset, that while the events in the timelines appear within the year of their occurrence, they are not necessarily coordinated to reflect a specific date or the text below.

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In the Beginning . . .

Genesis to 1920

In these waning years of the twentieth century we tend to be surprised from time to time to read a current news story about a "broadcast pioneer" or hear a radio interview or see a television program with one of the men or women who were involved at the very beginning of broadcasting. For most people—that is, anyone under 75 years of age—radio seems to have been around forever. For people not yet 40, the same seems to be true for television. Many of us are sometimes startled to learn that the not-too-old-looking grayhead we have seen in a TV interview or met in person is a television pioneer.

But when we consider that the first radio station in the United States was licensed by the federal government in 1921 and full commercial television operation authorized in 1941, we realize that broadcasting is, indeed, a twentieth-century phenomenon.

Like all new inventions, however, neither radio nor television blossomed full grown out of the ether. As many inventors have said, they "stand on the shoulders" of those who preceded them. Each new discovery is based, either directly or indirectly, on previous work in a similar area of endeavor. Samuel F.B. Morse's wire telegraph in 1835 led to Alexander Graham Bell's wire telephone in 1875, which, in turn, set the stage for Guglielmo Marconi's wireless, or radio, telegraph in 1895. The next logical step was a wireless telephone. No one knows for certain when the first human voice was communicated over the airwaves, but the predecessor of modern radio is frequently attributed to Reginald A. Fessenden in 1906, with an acknowledgment to Nathan B. Stubblefield's experimental transmissions as early as 1892. Finally, it took Lee de Forest's invention in 1906 of the audion, a tube that could amplify the signal for distance broadcasting purposes, to make possible the development of radio as we know it today. De Forest is generally considered the "father" of American radio.

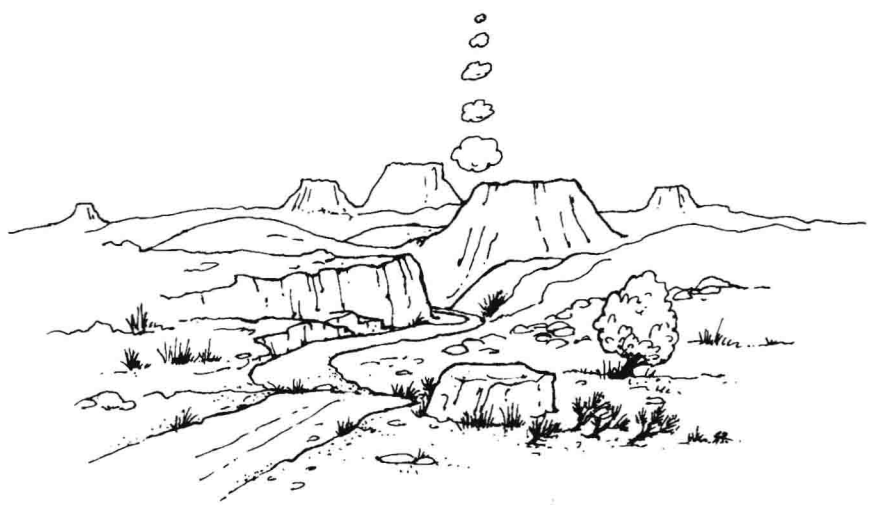
But even de Forest didn't do it alone. His successes were dependent on the earlier work of the American inventor Thomas Alva Edison and the English engineer Sir John A. Fleming, and on dozens of other scientists—such as James Clerk Maxwell and Heinrich Hertz—before

them. The groundwork for radio and television was laid in the nineteenth century.

The Ancients to the Twentieth Century

There has always been a need for mass communication. When the first caveman or cavewoman danced the first dance, it was for the purpose of conveying an event, an idea, or a warning to a group of cave dwellers. Cave drawings, many of which are considered artistic, did not have art as a purpose. They were meant to tell something to others. Distance communication to a group of persons has been sought throughout history: fire and smoke signals, drums, sunlight reflection, musical instruments, gunfire. War has always been a progenitor of inventions for distance communication. The Argonauts conveyed messages from their ships by using different sail colors. Julius Caesar constructed high towers at intervals so that sentinels could shout messages along the route; some historians estimate that 150 miles could be covered in only a few hours.

The ancient Greeks developed a system of signaling between ships by using flags. In medieval times, when gunpowder became a key ingredient of warfare, the number and frequency of cannon fire were translated into signals. When a town came under attack, the populace was warned through the ringing of bells. Trumpets were used as signals into the twentieth century. The heliograph was used exten-



Native Americans used puffs of smoke to send information.

sively for centuries, reflecting sunlight off a mirrored surface as far as 7 miles. Native Americans used puffs of smoke during the day and torches and flaming arrows at night to send information. One of the most important preelectronic distance information systems was the semaphore, an ancient Roman device redeveloped by Claude Chappe in France in 1794; the French government erected towers 5 miles apart and placed huge cross arms at the top of each. The semaphore continued to be used even after the inventions of the telegraph and telephone. In some parts of the world, carrier pigeons are still used as message carriers over long distances.

As early as 1267, the basic concept of using what we now know as electricity for conveying messages was suggested by the English philosopher Roger Bacon—who was promptly imprisoned for allegedly advocating "black magic." Three hundred years later, in Italy, Giovanni Battista della Porta was ridiculed after writing a book on "natural magic" in which he proposed that magnetism could be used to transmit information. It wasn't until the late eighteenth century that the notion of electricity as a useful tool was accepted, due to such inventions as the Leyden jar and to Benjamin Franklin's experiments with lightning. The late eighteenth and early nineteenth centuries saw seminal discoveries in the nature of electricity by physicists all over the world, including Michael Faraday in England, André Ampère in France, George Ohm in Germany, and Count Alessandro Volta in Italy. The last three names are immortalized as standard terms for electric functions today.

Samuel F.B. Morse's invention of the electromagnetic telegraph in 1835 opened the door to the distance communications of today. It took 6 years of struggle and rejection, however, before a grant from Congress in 1841 to run a telegraph line between Washington, D.C., and Baltimore established the acceptance of the telegraph. Its success in conveying the results of the Democratic National Convention in 1844 enabled Morse to raise enough private funds to extend the telegraph to Philadelphia and New York, and within a few years telegraph systems had been constructed into other parts of the country. In 1861 Western Union built the first transcontinental telegraph line. During this same period, in 1842, Morse proved that distant signals could be sent underwater, as well, and in 1866, after a number of unsuccessful tries, Cyrus W. Field established a transatlantic underwater cable between Europe and the United States, linked in Newfoundland.

The importance of these new techniques for distance communication was reflected in the government's assumption of regulatory powers. The Post Roads Act of 1866 authorized the Postmaster

General to fix rates annually for telegrams sent by the government. In 1887 the government authorized the Interstate Commerce Commission (ICC) to require telegraph companies to interconnect their lines for more extended public service.

The transmission of voice messages by wire—as differentiated from the dit-dah signals of the telegraph—did not come about until 1876, when Alexander Graham Bell was credited with the invention of the telephone, on March 10 of that year uttering the famous words over a wire to an associate, "Mr. Watson, come here. I want to see you." The first regular telephone line was constructed in 1877, between Boston and Somerville, in Massachusetts.

But even the great Bell stood on the shoulders of those who came before. Decades earlier, such scientists as G.G. Page, Charles Borseul, and Philip Reis were experimenting with the electromagnetic transmission of sound. In 1837, for example, Reis discovered that the magnetization and demagnetization of an iron bar could cause the emission of sounds. Some historians credit Reis with the initial development of the principle of the telephone. With the founding of the Bell Telephone Company in 1878 and the incorporation of the American Telephone and Telegraph Company (AT&T) in 1885, the growth of distance communication in America was assued.

Yet the telephone was not immediately praised or even accepted. Just as with later inventions, such as television, the telephone created visions of control of the masses and invasions of privacy. A cartoon in the *New York Daily Graphic* of March 15, 1877, for example, illustrated what the artist called the "terrors of the telephone" by showing a speaker at a telephonelike device mesmerizing masses of people listening simultaneously throughout the world. Of course, the opposite was also present: cartoons, articles, and even popular songs lauded the potential wonders of the telephone, including the distance dissemination to mass audiences of music, information, drama, and education—precisely what radio broadcasting was initially lauded for when it began. In fact, in 1881 a French engineer, Clément Ader, filed a patent for "Improvements of Telephone Equipment in Theaters" for the purpose of putting telephones on theater stages so that subscribers could hear the performances at home. Ader's Paris Opera Experiment was an example of wired broadcast transmission.

Even before wired voice transmission came into use, scientists were seeking means of wireless transmission. In 1864 a Scottish physicist, James Clerk Maxwell, predicted the existence of radio waves—that is, waves on which communication signals could be carried, similar to the signals that could be carried over telegraph wires.

1895 — Guglielmo Marconi sends and receives a radio signal.

1897 — Karl Ferdinand Braun produces a cathode-ray oscilloscope.

1899 — Marconi sends a wireless signal across the English channel.

This became known as the electromagnetic theory. As early as 1872, a patent for nonradiation wireless was obtained in the United States by Mahlon Loomis, and in that same decade William Cookes developed the first cathode-ray tube. But actual distance transmission still hadn't been invented. In 1887 theory turned into reality when a German physicist, Heinrich Rudolf Hertz, projected rapid variations of electric current into space in the form of radio waves similar to those of light and heat. In 1892 he sent electric waves around an oscillating (regularly fluctuating) circuit. So important were Hertz's contributions that his name has been adopted as the measure of all radio frequencies. During the same period, an American inventor, Nikola Tesla, experimented with various forms of wireless transmission and, although he has largely been neglected by historians, today there are Tesla Societies that maintain he is responsible for the invention of wireless transmission and modern radio.

While aural transmission was still being perfected, even back in the 1880s scientists were experimenting with visual transmission potentials that 40 years later would turn into television. In 1880 a Frenchman, Maurice Lablance, developed the principle of scanning, in which an image is converted to electric signals by a line-by-line registration of its features. This principle would become the basis for video technology. A German scientist, Paul Nipkow, implemented this principle in 1884 by designing the first mechanical scanning disk. Before the end of the century, in 1897, the German physicist Karl Ferdinand Braun produced a cathode-ray oscilloscope that could visually observe electric signals. But that would take a backseat to radio.

It is the Italian inventor Guglielmo Marconi who is credited with the first successful demonstration of the wireless, or radio, telegraph. In 1895 he sent and received a radio signal, and in 1899 showed that it could be done at a distance, across the English Channel. Later that year Marconi came to the United States to report the America's Cup yacht race by wireless for the *New York Herald*, and while here he formed the American Marconi Telegraph Company, which would later prove to be a key power in the establishment of radio stations. That same year, 1899, the U.S. Navy tried out wireless communication.

Radio broadcasting, however, was still some years off. As noted earlier, some attribute the first wireless transmission of a human voice to the inventor Nathan B. Stubblefield, who in 1892 sopkle the words "Hello, Rainey" to an assistant a distance away in an experiment near the town of Murray, Kentucky. Yet the basis for AM radio is the

Guglielmo Marconi was the first to successfully demonstrate the wireless telegraph. *Courtesy RCA.*

electron tube, and it is generally assumed that at the time of Stubblefield's experiments it had not yet been invented, and that Stubblefield used both induction and conduction at very low frequencies. Although in 1883 Thomas Alva Edison had observed the emission of electrons from a heated surface, such as a tube's cathode, the discovery of the electron is credited to the British researcher Sir J.J. Thomson in a series of experiments in the 1890s. Nevertheless, further steps, specifically an electron tube and amplification, were necessary before the electron could be used for broadcasting. Sir John A. Fleming and Lee de Forest took those steps some years later. De Forest, noted earlier as the father of American radio, presaged the future as the nineteenth century came to an end. In 1899, in his doctoral dissertation at Yale University, de Forest wrote on the spread of the radio waves discovered in the preceding decade by Heinrich Hertz. It took yet another decade to enter the Broadcast Century.

President McKinley assassinated; Theodore Roosevelt succeeds him.

Picasso's first Paris exhibit.

American Automobile Association founded.

Peasant uprisings in Russia.

1902

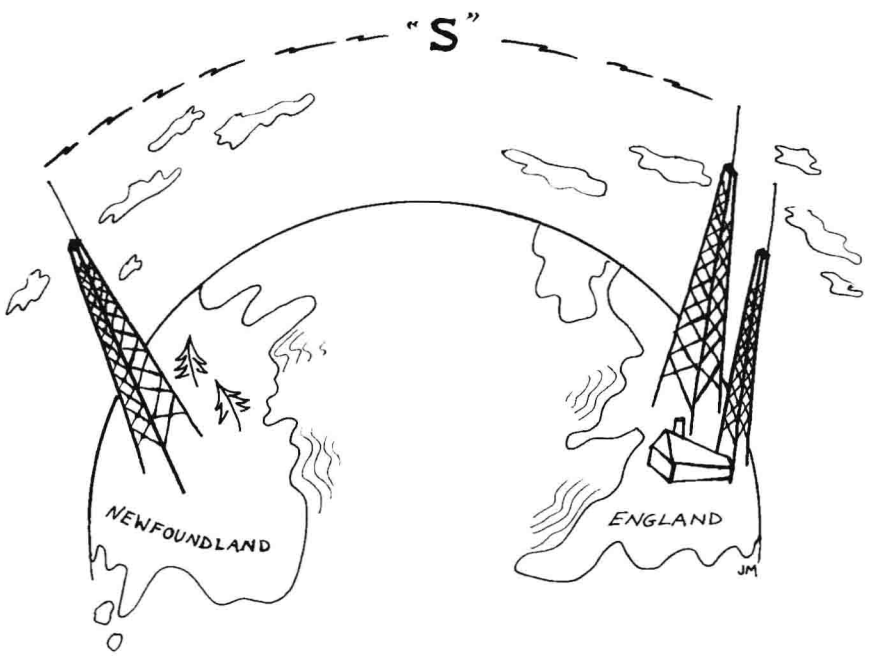
Marconi sends a wireless signal across the Atlantic.

Reginald Fessenden develops a continuous wave (electrolytic) detector.

The First Decade, 1900–1909: The Wireless Arrives

The first decade of the twentieth century saw a rapid advancement in the inventions, business organization, university experiments, and citizen interest required to make radio a reality. Several names—Fessenden, de Forest, Fleming, and Marconi—were principally responsible for the development of broadcast radio before the end of the decade.

At the same time that a Canadian, Reginald A. Fessenden—who was later to be credited with the first true radio broadcast—was working for the U.S. Weather Bureau to experiment with disseminating weather information by wireless, Marconi was setting up an experiment that would get worldwide headlines and become a significant spur to further radio development. In 1901 Marconi and his assistant, George Kemp, listened to a telephone receiver on top of a hill in Saint John's, Newfoundland, and heard the Morse code signal, three dots, for the letter S—which was being transmitted from Cornwall, England, more than 2000 miles away. That same year the U.S. Navy, influenced by Marconi's previous successes, replaced its visual signaling and homing pigeons with the wireless telegraph. Other U.S. government



Marconi's wireless audio crosses the Atlantic in 1901.

John Ambrose Fleming, developer of the diode tube.

agencies, including the Army and the Department of Agriculture, conducted experimental operations with the wireless.

Ships of various nations adopted the wireless, and its success at protecting life and property became so widespread throughout the world that in 1903 an international conference was held in Berlin to discuss common distress-call signs for ships and to promote wireless communication between ship and shore—which was not yet in practice—as well as between ships. A few years later the international distress signal, SOS, was adopted and remains is use today.

The next goal was to transmit the human voice comparable distances over the wireless. Both de Forest and Fessenden were confident that it was possible to do so. In 1902 each established a communications business: Fessenden's National Electric Signaling Company and de Forest's Wireless Telegraph Company. Fessenden believed it was necessary to go beyond Marconi's basic approach, and instead of a wave interrupted with intermittent impositions, he advocated a continuous wave on which modulations would be superimposed. He had demonstrated in 1901 that it could be done, and in 1902 he developed an electrolytic detector. Two years later, in England, the engineer Sir John A. Fleming developed the glass-bulb detector, which was a simple electron tube, a diode, necessary to receive voice signals. But the diode couldn't amplify the electronic signals.

Other experimenters were engaged by the wireless, a professor at the University of Graz in Austria, Otto Nussbaumer, was doing almost the same thing. He invented a detector circuit that peeled off the sound at the receiving end, enabling him to send sounds rather than just dots and dashes. Using an experimental transmitter, he yodeled an Austrian folk song that was heard in the next room, ostensibly the first "music" ever transmitted by wireless. But he, too, lacked the means for amplification necessary for true broadcasting.

De Forest took the next step. He added a third element, or grid, to the Fleming vacuum tube and in 1906 filed a patent for his tube, calling it the audion. This "triode" tube enabled the signal to be amplified, making possible distant voice transmission over the wireless, and ushered in the age of radio. The following year, de Forest formed the de Forest Radio Telephone Company, which began broadcasting in New York. An entry in his diary that year stated: "My present task is to distribute sweet melody broadcast over the city and sea so that in time even the marine far out across the silent waves may hear the music of his homeland."*

But Fessenden had already beaten de Forest to it. Using a high frequency altenator, on Christmas Eve in 1906, radio operators on

* Wireless transmission were enhanced by using a device called the high frequency arc (also know as the Poulsen arc). The early experiments of de Forest, and to some extent others, were significantly aided by this innovation.