

## 1900-1910 - BIRTH

1. **THE INVENTION OF THE WIRELESS TELEGRAPH:** Guglielmo (Bill) Marconi has ideas for an invention that will (a) replace the wired telegraph, (b) help ensure the safety of ships at sea. Marconi sends, in 1900, his famous S (dit dit dit) in Morse code from England to Canada.

2. **FROM WIRELESS TELEGRAPH TO WIRELESS TELEPHONE:** Inventors like Lee de Forest and Reginald Fessenden want to find a wireless substitute for the wired telephone. The human voice could add a nuance to communication not possible with the telegraph, but people like Marconi decry it, saying it will not be private and others will be able to hear it.

3. **THE FIRST BROADCAST:** In 1906 at Brant Rock MA, Fessenden plays his violin, sings a song, reads a bible verse or two into a wireless telephone of his own invention. This is the first broadcast and it happens Christmas Eve, 1906. It is a broadcast because it is designed for more than one listener (not 2-way) it is pre-announced. His goal is to find financial backers.

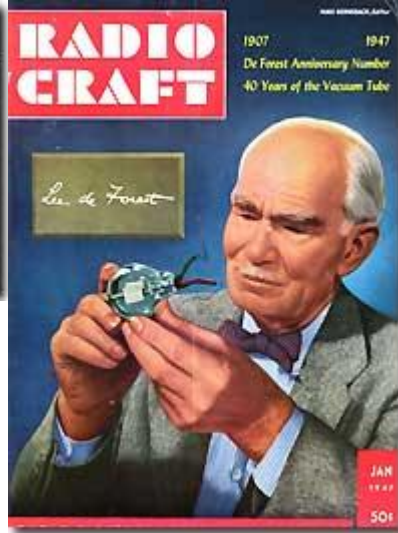
4. **LEE DE FOREST:** Probably the most important person in the development of radio, de Forest does two important demonstrations of wireless telephone; (1) in 1907 he equips the Navy fleet with his wireless telephone, an arc transmitter, and plays phonograph records to shore stations as the fleet comes into ports like San Francisco, and (2) in NYC he broadcasts on several occasions well-known opera singers to an audience of reporters. He wants to bring culture into homes.

5. **CHARLES HERROLD:** In San Jose, Herrold in April 1910 is quoted in a notarized affidavit published in a national magazine, "we have given wireless phonograph concerts to amateur men in Santa Clara Valley," one of the very first published references to what we now know as the activities of radio broadcasting to an audience of more than one. He operates a wireless training schools, The Herrold College of Wireless and Engineering in a building at the corner of First and San Fernando.

## 1910-1920 - EXPERIMENTATION

1. **CHARLES HERROLD:** Between 1912 and 1917 Herrold and his students are broadcasting music and talk on a regular schedule to a growing San Jose audience. College radio. He also broadcasts every day to receiving stations at the Pan Pacific International Exhibition in 1915.

2. **WORLD WAR ONE:** April, 1917. All amateur wireless stations are ordered shut down, silent, so that the Government can use radio for defense purposes. The war is important to radio technically as the vacuum tube, invented earlier by de Forest is improved for war communication, and all other radio patents are pooled for defense reasons.



3. LEE DEFOREST:  
After the wartime ban on wireless ends in 1918 he sets up a station in High Bridge NY, and broadcasts music, news, election returns, etc to NYC, this time using his vacuum tube as a transmitter. The Federal Radio Inspector shuts him down saying "there

is no place on the ether for entertainment." Most still believed that radio should be for two-way communication, and there was general agreement that the Navy would be in charge of all radio. De Forest comes to San Francisco and sets up another station in 1919 and broadcasts daily.

4. FRANK CONRAD: Meanwhile, in Pittsburgh, PA a Westinghouse Corporation engineer named Frank Conrad had been allowed by the government to be on the air during the war to develop the de Forest vacuum tube into a transmitter for the war effort. He uses a phonograph to test the audio; he gets calls from a few experimenters who are, in defiance of government order, illegally listening to his tests. He plays records to this clandestine audience every Saturday Night.

#### 1920-1930 - RADIO ARRIVES

1. LICENSED RADIO BROADCASTING: Conrad's company, Westinghouse, asks him to go on the air on a regular basis to send out music and they'll sell radios to pay for the service. They apply for a commercial radio license and in November, 1920, KDKA goes on the air to broadcast the election returns of the Harding-Cox presidential contest. Westinghouse takes out ads in the newspaper advertising radios for sale to the home consumer. This station receives the first official government license. The dark years of war give way to peace and prosperity.

2. BROADCASTING'S DECADE: Within a few years there are hundreds of stations entertaining thousands of people who buy or build their own receivers, mostly crystal sets with earphones. Under a government-sanctioned agreement, the Radio Corporation, RCA is formed to manage the patents for the technology of the receiver and transmitter. General Electric and Westinghouse are allowed to make receivers, Western Electric is allowed to build transmitters and AT&T is allowed to engage in "toll broadcasting" and "chain broadcasting."

3. TECHNOLOGY: The decade begins with people listening to home made crystal sets with headphones, progresses to large battery-operated sets with dozens of dials and a horn speaker to electric console radios designed as fine furniture, single knob tuning and loudspeakers.



4. ADVERTISING:  
By 1923, WEAF in New York accepts ad." Because owned by only station

the first "radio this station is AT&T, it is the allowed to engage in "toll broadcasting" under the RCA agreements. Other stations are already advertising because no one can stop them. Many stations are owned by businesses and their only reason for broadcasting is to sell something.

5. NETWORKS: Having broken the AT&T monopoly on "chain broadcasting" NBC and CBS are formed as the first radio networks by the late 1920s.

6. REGULATION: The radio dial is filled with hundreds of unregulated transmitters, many interfering with each other to the point where no one can get clear reception. The Federal Radio Commission is formed and the Radio Act of 1927 is passed which re-assigns stations to clearer frequencies, and for the first time makes radio stations operate in the public interest, convenience and necessity. The decade ends with radio as a fully formed industry. Amos and Andy is #1. The roaring 20s will give way to the great depression. A major social change is on the way.

1915-1916

- 1915: Wireless radio service connects U.S. and Japan.
- 1915: Radio-telephone carries speech across the Atlantic.
- 1915: Birth of a Nation sets new movie standards.
- 1915: The electric loudspeaker.
- 1916: David Sarnoff envisions radio as "a household utility."
- 1916: Cameras get optical rangefinders.
- 1916: Radios get tuners.

1917-1918

- 1917: Photocomposition begins.
- 1917: Frank Conrad builds a radio station, later KDKA.
- 1917: Condenser microphone aids broadcasting, recording.
- 1918: First regular airmail service: Washington, D.C. to New York.

1919

- 1919: People can now dial telephone numbers themselves.
- 1919: Shortwave radio is invented.
- 1919: Flip-flop circuit invented; will help computers to count.

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1920

- 1920: The first broadcasting stations are opened.
- 1920: First cross-country airmail flight in the U.S.
- 1920: Sound recording is done electrically.
- 1920: Post Office accepts the postage meter.
- 1920: KDKA in Pittsburgh broadcasts first scheduled programs.

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1921

- 1921: Quartz crystals keep radio signals from wandering.
- 1921: The word "robot" enters the language.
- 1921: Western Union begins wirephoto service.

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1922

- 1922: A commercial is broadcast, \$100 for ten minutes.
- 1922: Technicolor introduces two-color process for movies.
- 1922: Germany's UFA produces a film with an optical sound track.
- 1922: First 3-D movie, requires spectacles with one red and one green lens.
- 1922: Singers desert phonograph horn mouths for acoustic studios.
- 1922: Nanook of the North, the first documentary.

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1923

- 1923: Zworykin's electronic iconoscope camera tube and kinescope display tube.
- 1923: People on one ship can talk to people on another.
- 1923: Ribbon microphone becomes the studio standard.
- 1923: A picture, broken into dots, is sent by wire.
- 1923: 16 mm nonflammable film makes its debut.
- 1923: Kodak introduces home movie equipment.
- 1923: Neon advertising signs.

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1924

- 1924: Low tech achievement: notebooks get spiral bindings.
- 1924: The Eveready Hour is the first sponsored radio program.
- 1924: At KDKA, Conrad sets up a short-wave radio transmitter.
- 1924: Daily coast-to-coast air mail service.
- 1924: Pictures are transmitted over telephone lines.
- 1924: Two and a half million radio sets in the U.S.

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1925

- 1925: The Leica 35 mm camera sets a new standard.
- 1925: Commercial picture facsimile radio service across the U.S.
- 1925: All-electric phonograph is built.
- 1925: A moving image, the blades of a model windmill, is telecast.
- 1925: From France, a wide-screen film.

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1926

- 1926: Commercial picture facsimile radio service across the Atlantic.
- 1926: Baird demonstrates an electro-mechanical TV system.
- 1926: Some radios get automatic volume control, a mixed blessing.
- 1926: The Book-of-the-Month Club.
- 1926: In U.S., first 16mm movie is shot.
- 1926: Goddard launches liquid-fuel rocket.
- 1926: Permanent radio network, NBC, is formed.
- 1926: Bell Telephone Labs transmit film by television.

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1927

1927: NBC begins two radio networks; CBS formed.  
1927: Farnsworth assembles a complete electronic TV system.  
1927: Jolson's "The Jazz Singer" is the first popular "talkie."  
1927: Movietone offers newsreels in sound.  
1927: U.S. Radio Act declares public ownership of the airwaves.  
1927: Technicolor.  
1927: Negative feedback makes hi-fi possible.

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1928

1928: Baird demonstrates color TV on electro-mechanical system.  
1928: The teletype machine makes its debut.  
1928: Television sets are put in three homes, programming begins.  
1928: Baird invents a video disc to record television.  
1928: In an experiment, television crosses the Atlantic.  
1928: In Schenectady, N.Y., the first scheduled television broadcasts.  
1928: Steamboat Willie introduces Mickey Mouse.  
1928: A motion picture is shown in color.  
1928: Times Square gets moving headlines in electric lights.  
1928: IBM adopts the 80-column punched card.

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1929

1929: Experiments begin on electronic color television.  
1929: Telegraph ticker sends 500 characters per minute.  
1929: Ship passengers can phone relatives ashore.  
1929: Brokers watch stock prices on an automated electric board.  
1929: Something else new: the car radio.  
1929: In Germany, magnetic sound recording on plastic tape.  
1929: Television studio is built in London.  
1929: Air mail flown from Miami to South America.  
1929: Bell Lab transmits stills in color by mechanical scanning.  
1929: Zworykin demonstrates cathode-ray tube "kinescope" receiver, 60 scan lines.

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1930

1930: Photo flashbulbs replace dangerous flash powder.  
1930: "Golden Age" of radio begins in U.S.  
1930: Lowell Thomas begins first regular network newscast.  
1930: TVs based on British mechanical system roll off factory line.  
1930: Bush's differential analyzer introduces the computer.  
1930: AT&T tries the picture telephone.

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1931

1931: Commercial teletype service.  
1931: Electronic TV broadcasts in Los Angeles and Moscow.  
1931: Exposures meters go on sale to photographers.  
1931: NBC experimentally doubles transmission to 120-line screen.

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1932

1932: Disney adopts a three-color Technicolor process for cartoons.  
1932: Kodak introduces 8 mm film for home movies.  
1932: The "Times" of London uses its new Times Roman typeface.  
1932: Stereophonic sound in a motion picture, "Napoleon."  
1932: Zoom lens is invented, but a practical model is 21 years off.  
1932: The light meter.  
1932: NBC and CBS allow prices to be mentioned in commercials.

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1933

1933: Armstrong invents FM, but its real future is 20 years off.  
1933: Multiple-flash sports photography.  
1933: Singing telegrams.  
1933: Phonograph records go stereo.  
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