

A U. S. Television Chronology, 1875-1970

Channels listed in program section

NEW YORK CITY		ZONE			
②	WCBS-TV (CBS)	485 Madison Ave.,	22.	⑪ WPIX (Ind.) 220 East 42 St., 17.	
④	WRCA-TV (NBC)	30 Rockefeller Pl.,	20.	⑫ WATV (Ind.) Empire State Bldg., 1.	
⑤	WABD (Du Mont)	205 East 67th St.,	21.	CONNECTICUT	
⑦	WABC-TV (ABC)	7 West 66th St.,	23.	⑧ WNHC-TV (ABC, CBS, Du Mont)	1110 Chapel St., New Haven, 10.
⑨	WOR-TV (Ind.)	1440 Broadway,	18.	⑬ WICC-TV (ABC, Du Mont)	Booth Hill Road, Trumbull (Bridgeport)

Advertising: 10 Rockefeller Plaza, New York 20; JUdson 6-4300. **Editorial:** 30 Rockefeller Plaza, New York 20; Circle 6-4488. **Subscription:** Box 8019, Phila. 1, Pa.

The channel line-up in the New York Metropolitan edition of *TV Guide*, Nov. 12, 1955.

This timeline of U. S. television broadcasting history is a work in progress. If you can suggest any improvements in this list, please send them to Jeff Miller. The following people have contributed to this page: Donna Halper, Bob Carpenter, Joseph Gallant, Paul Lindemeyer, Wesley Orr, Dan Kallenberger, Mark Leff, Pat Dyer, Neil Nelkin, Dave Robertson, Al Robinson, Xen Scott, William V. Sutherland, John Ross, Teddy Dibble, Chuck Davis, Tom Hoehler, Bill Hepburn, Rickey Stein, and Garrett Bauer. Last revision: Dec. 29, 2002.

An asterisk indicates the sign-on date for the station. Start dates are shown for all stations on the air or with a construction permit by Sept. 30, 1948, when a freeze on new applications was imposed.

1875. George R. Carey of Boston proposes a television system in which every picture element is transmitted simultaneously, each over a separate circuit.

1880. The principle of scanning an image is proposed, by E. E. Sawyer in the U. S., Maurice Leblanc in France, and others (approximate date).

1900. The term *television* is coined by Constantin Perskyi at the International Electricity Congress, part of the 1900 Paris Exhibition (*Tube: The Invention of Television* by David E Fisher and Marshall Jon Fisher, p. 29).

1921. Charles Francis Jenkins incorporates the Jenkins Laboratories in Washington for the sole purpose of "developing radio movies to be broadcast for entertainment in the home."

May 19, 1922. Charles Francis Jenkins achieves his first successful laboratory transmission.

Oct. 3, 1922. Jenkins first public demonstration, using Navy station NOF in Anacostia. He transmitted pictures, rather than television in the modern sense. The photographs were sent by a telephone wire from his Washington office to NOF and they were then broadcast by wireless back to the Post Office in Washington.

June 14, 1923. Jenkins' first true television demonstration, using NOF. (He continued to use NOF until 1925. By 1925, the NOF transmissions were on 1875 kHz, using 48 lines.)

Dec. 29, 1923. Zworykin applies for a patent for an all-electronic television system.

June 13, 1925. Charles Francis Jenkins achieves the first synchronized transmission of pictures and sound, using 48 lines, and a mechanical system. A 10-minute film of a miniature windmill in motion is sent from Anacostia to Washington, D. C., a distance of 5 miles. The images were viewed by representatives of the Bureau of Standards, the Navy, the Commerce Department, and others. Jenkins called this "the first public demonstration of radiovision" (although Baird had publicly demonstrated a working television set at Selfridge's Department Store in London two months earlier).

1926. Orrin Dunlap, radio editor of the *New York Times*, describes television as "an inventor's will-o'-the-wisp."

Aug. 18, 1926. A weather map is televised for the first time, sent from NAA Arlington to the Weather Bureau Office in Washington.

Dec. 1926. WGY's TV station*, video 37.8 meters, sound 755 kHz

Apr. 7, 1927. An image of Commerce Secretary Hoover is transmitted in the first successful long distance demonstration of television using Bell Telephone Co. experimental station 3XN, Whippany NJ. 3XN used 1575 kHz video, 1450 kHz audio, 185 synch. AT&T had not previously announced its television research, which was being conducted by Herbert E. Ives and others.

May 23, 1927. The first demonstration of television before a large audience, about 600 members of the American Institute of Electrical Engineers and the Institute of Radio Engineers, at the Bell Telephone Building in New York.

Sept. 7, 1927. Philo T. Farnsworth demonstrates TV in San Francisco. His transmission was electronic, unlike the mechanical TV of Bell Labs, Jenkins, and others.

Jan. 13, 1928. Alexanderson demonstrates the GE system and announces the beginning of television broadcasting. The pictures were received on sets with 1.5 square inch screens in the homes of Alexanderson and two board members in Schenectady. (This is considered by some the first home reception of television in the U. S.) The picture, with 48 lines at 16 frames per second, was transmitted over 2XAF on 37.8 meters and the sound was transmitted over WGY radio station.

Feb. 25, 1928. FRC grants first TV license to Jenkins Laboratories for W3XK at 1519 Connecticut Ave. NW Washington. On air 7/2/28? 6.42 MHz, 48 lines. (In 1929 it was authorized to move the transmitter to between Silver Spring and Wheaton. The station ceased to operate on Oct. 31, 1932.)

Apr. 1928. W2XBS New York, RCA, begins in the laboratory.

May 11, 1928. The first regular schedule of TV programming is begun by General Electric in Schenectady. Programs are transmitted Tuesday, Thursday, and Friday afternoons from 1:30 to 3:30 p.m., using 24 lines.

July 1928. These stations are on the air on this date, according to John Ross: W2XBU Beacon NY (Harold E. Smith); W2XBV New York (RCA); W2XBW Bound Brook NJ (RCA); W2XAV East Pittsburgh (Westinghouse); W4XA White Haven TN; W6XC Los Angeles.

July 2, 1928. Charles F. Jenkins begins broadcasting the first regular telecasts designed to be received by the general public.

July 12, 1928. First televised tennis match.

July 21, 1928. Boston Post reports W1XAY Lexington MA has been licensed.

Aug. 13, 1928. WRNY Coytesville NJ becomes the first standard radio station to transmit a television image (the face of Mrs. John Geloso). It was a 1.5 square inch image enlarged by a magnifying glass to three inches so it could be viewed by 500 persons at Philosophy Hall at New York University. Station also operated W2XAL New York, 9.705 MHz. (WRNY broadcast sight and sound alternately rather than simultaneously. Viewers would first see the face of a performer and a few seconds later would hear the voice. The performances took place for 5 minutes every hour and were designed to lure the radio audience into buying "televisor" sets from Pilot. [Tube: The Invention of Television, by Fisher])

Aug. 22, 1928. WGY simulcasts on radio and TV (WGY, 2XAF and 2XAD) Al Smith accepting the Democratic presidential nomination. This was the first over-the-air remote pickup and the first TV news event.

Sept. 11, 1928. First play broadcast by television, "The Queen's Messenger," on W2XAD. (Sound was also broadcast over WGY radio.) Video was on 21.4 meters; sound was on 31.96 meters. The event was reported on page 1 of the *New*

York Times the next day. (During 1928, Ernest Frederik Werner Alexanderson of General Electric transmitted daily TV tests over W2XAD.)

Sept. 11, 1928. First TV signal in Buffalo, on WMAK in Kenmore

Late Oct. 1928. W1XAY* Lexington MA. (The station was licensed to J. Smith Dodge and C. F. Jenkins. J. Smith Dodge was a former engineer for WNAC and former announcer at WGI. Carl S. Wheeler was also involved in founding the station. Station basically broadcast WLEX's radio programming. The station remained on the air sporadically until the end of March 1930.)

1929. Milton Berle appears in an experimental TV broadcast. Film of the appearance survives.

1929. W2XBS (RCA) begins two-hour daily broadcasts from Van Cortlandt Park.

Mar. 27, 1929. W2XCL* Brooklyn NY (Pilot Radio and Tube Corp.) begins operating.

Mar. 30, 1929. Radio Service Bulletin lists these new stations: W9XAO Chicago IL (Nelson Brothers Bond and Mortgage Co.) 2.0-2.1 MHz, 500 watts; W2XCR Jersey City NJ (Jenkins Television Corporation) 2.1-2.2 MHz, 5000 watts; W2XCL Brooklyn NY (Pilot Electric Manufacturing Co.) 2.0-2.1, 2.75-2.85 MHz, 250 watts; W2XCO New York (RCA) 2.1-2.2 MHz, 5000 watts; W2XR New York (John V. L. Hogan), 500 watts (visual broadcasting and experimental); W2XCW Schenectady (General Electric) 2.1-2.2 MHz 20,000 watts.

April 1929. W1WX Boston begins experimental broadcasts two times a day with 100 watts. [These broadcasts continued until December, when the call was changed to W1XAV. The licensee of W1WX and W1XAV, Shortwave and Television Laboratory, Inc., was founded on 5 December 1928 by A. M. "Vic" Morgan, Hollis Baird, and Butler Perry. The company was officially dissolved on 1 January 1935, but by that time it existed only on paper, since Baird, Perry, and Morgan had all moved to General Television Corp, which they acquired on 8 March 1934. This information provided by Donna Halper, from state government records.]

Apr. 30, 1929. Radio Service Bulletin lists these new stations: W1XB Somerville MA (General Industries Co.) 500 watts (experimental and visual broadcasting).

May 11, 1929. The "first regularly scheduled TV broadcasts" begin (one source), three nights per week.

May 31, 1929. Radio Service Bulletin lists these new stations: W9XR Downers Grove IL (Great Lakes Broadcasting Co.) 2.1-2.2, 2.85-2.95 MHz, 5000 watts; W2XCP Allwood NJ (Freed-Eisemann Radio Corp.) 2.0-2.1, 2.85-2.95 MHz, 2000 watts (visual broadcasting and experimental).

June 27, 1929. First public demonstration of color TV, by H. E. Ives and his colleagues at Bell Telephone Laboratories in New York. The first images are a bouquet of roses and an American flag. A mechanical system was used to transmit 50-line color television images between New York and Washington.

July 1929. WOKO Poughkeepsie NY begins transmitting TV as W2XBUB in late July 1929.

July 31, 1929. Radio Service Bulletin lists these new stations: W9XAA Chicago (Chicago Federation of Labor), 6.08, 11.84, 17.78 MHz, 500 watts.

Aug. 31, 1929. Radio World reports WENR radio Chicago receives a license for a 5000 watt TV station (W9XR?).

Sept. 30, 1929. Radio Service Bulletin lists these new stations: W1XAV Boston (Shortwave and Television Laboratory Inc.) 2.1-2.2 MHz, 500 watts; W3XL Bound Brook NJ (RCA Communications Inc.) 2.85-2.95 MHz, 30,000 watts.

Oct. 31, 1929. Radio Service Bulletin lists these new stations: W10XU Airplane (Jenkins Laboratories), 2.0-2.1 MHz, 10 watts; W10XZ Airplane (C. Francis Jenkins), 1.608, 2.325, 3.088, 4.785, 6.335 MHz, 6 watts.

Nov. 30, 1929. Radio Service Bulletin lists these new stations: W9XAP Addison IL (Chicago Daily News), 2.75-2.85

MHz, 5000 watts.

1930. Don Lee's television station opens in Los Angeles.

Jan. 1930. W1XAV* Boston

Mar. 1930. (End of March) W1XAY Lexington MA goes off the air, leaving W1XAV temporarily as the only mechanical TV station in Boston.

Mar. 31, 1930. Radio Service Bulletin lists these new stations: W2XBO Long Island City NY (United Research Corporation), 2.0-2.1, 2.75-2.85 MHz, 5000 watts; W8XT East Pittsburgh PA (Westinghouse Electric and Manufacturing Co.), 660 kHz, 25,000 watts.

Apr. 30, 1930. Radio Service Bulletin lists these new stations: W2XAP Jersey City NJ (Jenkins Television Corporation), 2.75-2.85 MHz, 250 watts.

May 22, 1930. An audience at Proctor's Theatre in Schenectady becomes the first to see closed-circuit TV projected onto a big screen.

May 31, 1930. Radio Service Bulletin lists these new stations: W10XAL United States (portable) (National Broadcasting Co.), 2.392 MHz, 50 watts; W10XAO United States (portable) (National Broadcasting Co.), 1.584 MHz, 50 watts.

Aug. 9, 1930. An Associated Press item has: "Station WMAQ's new television transmitter is to be on the air some time this month. The first regularly scheduled sight programs in conjunction with a sound broadcast station are to provide studio scenes which are to be transmitted three times a day. The television station is W9XAP, 2800 kilocycles."

Aug. 20, 1930. The first demonstration of home reception of television, a half-hour broadcast from the Jenkins station, W2XCR in Jersey City, and the de Forest station W2XCD in Passaic. Two sets were available in public places and one in a press suite. (Or Aug. 25 1930)

July 30, 1930. NBC opens W2XBS, New York. W2XBS started as an RCA lab rig in Apr. 1928 and was used for big screen theater tests as early as Jan. 1930. In July 1930 it was put in charge of NBC broadcast engineers.

Nov. 1930. W9XAP Chicago (Chicago Daily News) broadcast the senatorial election returns. Press release claimed it was the first time a senatorial race, complete with charts showing the standings of the candidates as the votes were tallied, was ever televised.

Dec. 7, 1930. W1XAV Boston broadcasts a video portion of a CBS radio program, *The Fox Trappers* orchestra program, sponsored by I. J. Fox Furriers. Included was what is sometimes called the first television commercial, which was prohibited by FRC regulations. [However, Donna Halper reports that as early as 1928 W1XAY in Lexington Mass. simulcast one hour of WLEX radio daily, and there is a mention of commercials in that hour. She also reports that Big Brother Bob Emery made an appearance on W1XAV, as did several other Boston area announcers, when W1XAV tried on a few occasions in 1930-31 to telecast a Boston radio station's programming. They first tried WEEI and then WNAC. The FRC took a dim view of their attempts to telecast a network program, however, since there was no agreement yet about whether or not experimental TV stations could run network commercials, so the FRC advised them not to try it.]

Dec. 13, 1930. Radio World lists W1XY Lawrence MA (Pilot).

1931. The following stations are listed with 1931 start dates in the 1950 *Broadcasting Yearbook*: ch. 2, KTSL, Hollywood, CA

Feb. 24, 1931. *New York Times* article (p. 32) refers to daily television broadcasts which began the previous evening on W2XCD (De Forest) in Passaic.

Apr. 1931. W2XCR, Jenkins second station, moves from its original site in Jersey City to 655 Fifth Avenue in New York. The station now had 5000 watts power, and could broadcast 60-line pictures rather than 48-line pictures.

Apr. 26, 1931. Jenkins Television Corp. gives a public demonstration on W2XCR, beginning a regular schedule of four hours per day, which lasted into early 1932. Simulcast with WGBS radio.

May 1, 1931. The first marriage is broadcast on TV, on W2XCR New York.

July 21, 1931. W2XAB New York (CBS) begins broadcasting the first regular seven-day-per-week TV broadcasting schedule in the U. S., 28 hours per week with live pickups and a wide variety of programs. The first broadcast included Mayor James J. Walker, Kate Smith, and George Gershwin.

Sept. 4, 1931. W9XD (later WTMJ-TV) Milwaukee licensed. (The first application for a TV license was filed May 5, 1930.)

Oct. 1931. W1XG* Boston (Shortwave and Television Laboratory). This was a VHF station with 30 watts. Chief Engineer was Hollis Baird; studios were at 70 Brookline Ave.

Oct. 18, 1931. British television pioneer John Logie Baird appears on WMCA radio to discuss a proposed television station to be operated jointly by his company and WMCA. (Radio Pictures Inc. objected to the proposed station since the applicant was a foreign organization, and the FRC denied the application.)

Oct. 30, 1931. NBC puts a TV transmitter atop the Empire State Building. The first experimental TV broadcast from the ESB was on Dec. 22, 1931.

1932. RCA demonstrates an all-electronic television system, originally with 120 lines.

Aug. 7, 1932. *New York Times* article describes reception reports received by W2XAB.

Nov. 8, 1932. CBS TV reports on the presidential election to an estimated 7500 sets, or 9000 sets according to CBS's estimate. Program consisted of commentary, return charts, still cartoons of politicians.

Jan. 23, 1933. W9XAL Kansas City first day of broadcasting. [*Journal-Post News Flashes* with John Cameron Swayze begin the following day at 12:00 p.m. as a daily program simulcast on KMBC radio.]

Jan. 25, 1933. W9XK Iowa City, Iowa, begins mechanical TV broadcasts, with sound on its radio station WSUI. The program included a brief overview of the University of Iowa, a musical number, and a drama sketch. W9XK was the first educational station with regularly- scheduled programs.

Feb. 20, 1933. CBS suspends television broadcasts.

Mar. 10, 1933. W6XAO (later KTSL, for Thomas S. Lee, then KNXT and KCBS-TV) Los Angeles begins full-scale broadcasting. An earthquake struck Los Angeles the same day, and films of the damage were broadcast the next day. (W6XAO was the first broadcasting station to show a current full-length motion picture, *The Crooked Circle*.) According to *Broadcasting* magazine, W6XAO started Oct. 4, 1939 and the call was changed to KTSL in 1949 and KNXT in 1951. Another source gives May 6, 1948, as the start date for KTSL.

June 27, 1934. W1XAV Boston is discontinued. The FCC told Shortwave and Television Laboratory that the world didn't need two mechanical TV stations. One license was accepted, the other was denied, effective 13 July 1934. At this point Shortwave and Television changed its name to General Television Corp. and switched from a mechanical to an electronic system.

Dec. 1934. Philo Farnsworth demonstrates a non-mechanical television system.

1935. (Mid 1935) W1XG Boston changes from a mechanical to an electronic system.

April-May 1935. *Short Wave Listener Magazine* for April-May 1935 lists these television stations:

2000-2100 kc.

W2XDR Long Island City NY
 W8XAN Jackson MI
 W9XK Iowa City IA
 W9XAK Manhattan KS
 W9XAO Chicago IL
 W6XAH Bakersfield CA

2750-2850 kc.

W3XAK portable
 W9XAP Chicago IL
 W2XBS Baltimore MD
 W9XAL Kansas City MO
 W9XG West Lafayette IN
 W2XAB New York NY

42000-56000, 60000-86000 kc.

W2XAX New York NY
 W6XAO Los Angeles CA
 W9XD Milwaukee WI
 W2XBT portable
 W2XF New York NY
 W3XE Philadelphia PA
 W3XAD Camden NJ
 W10XX portable and mobile [Vicinity of Camden NJ]
 W2XDR Long Island City NY
 W8XAN Jackson MI
 W9XAT portable
 W2XAD New York NY
 W2XAG portable
 W1XG Boston MA
 W9XK Iowa City IA

Regarding W6XAH in Bakersfield, listed above, Mark D. Luttrell writes that it "was an experimental television station that was operated by Pioneer Mercantile Company in Bakersfield during 1932. The station was an experimental effort by the Schamblin brothers--Frank, Leo and Charles. It has been reported in several publications as 'the first television station west of the Mississippi River.' Due to technical problems the work ended later that year and the company then focused on starting a radio station which went on the air as KPMC 1560 AM in 1933 from Bakersfield. The station was later sold and is now owned by Buckley Radio in Connecticut. ...My grandfather worked in management for the company."

June 29, 1936. 343-line TV transmitted from the Empire State Building on W2XBS, the first high-definition television.

July 7, 1936. NBC's first attempt at actual programming after 6 years of tests: a 30-minute variety show strictly for RCA licensees, speeches, dance ensemble, monologue, vocal numbers, and film clips.

Aug. 15, 1936. *Broadcasting* reports Philco Corp. demonstrates its system of television with seven-mile transmission of live and film subjects in 345-line images 9 1/2 by 7 1/2 inches.

Nov. 6, 1936. RCA displays 343-line TV for the press as part of NBC's tenth anniversary celebration.

Apr. 1, 1937. *Broadcasting* reports CBS applies for experimental video station in New York, plans to install RCA TV transmitter in Chrysler building tower and to construct special studios.

May 1937. Gilbert Seldes becomes the first TV critic, with an article "Errors of Television" in the *Atlantic Monthly*.

May 15, 1937. *Broadcasting* reports RCA demonstrates projection television, with images enlarged to 8 by 10 feet, at Institute of Radio Engineers convention.

Oct. 13, 1937. FCC adopts new television allocations: seven channels between 44 and 108 MHz (44-50, 50-56, 66-72,

78-84, 84-90, 96-102, and 102-108 MHz), and 12 additional channels from 156-194 MHz. The higher channels are earmarked for a time when workable tubes are devised for these frequencies.

May 31, 1938. W2XBS telecasts the movie *The Return of the Scarlet Pimpernel*, starring Leslie Howard; the staff projectionist played the last reel out of order, ending the film 20 minutes early. After this incident, NBC could not obtain first-run movies for many years.

Nov. 15, 1938. First telecast of an unscheduled event, a fire, on NBC's W2XBT. A mobile unit was in a park in Queens when a fire broke out on Ward's Island, across the river. (However on Apr. 24 1936 an outdoor scene of firemen answering an alarm was transmitted by RCA from Camden, New Jersey.)

1939. The following stations are listed with 1939 start dates in the 1950 *Broadcasting Yearbook*: ch. 4, WNBT, New York, NY; ch. 4, WRGB, Schenectady, NY

Apr. 30, 1939. President Roosevelt is the first President to appear on television, from the New York World's Fair on W2XBS, now transmitting on 45.25 MHz visual and 49.75 MHz aural.

May 17, 1939. A Princeton-Columbia baseball game is telecast from Baker Field in New York by W2XBS, the first sports telecast 4 p.m. to 6:15 p.m. Bill Stern was the announcer.

June 1, 1939. First heavyweight boxing match televised, Max Baer vs Lou Nova, form Yankee Stadium.

Aug. 26, 1939. First major league baseball game telecast, a double-header between the Cincinnati Reds and the Brooklyn Dodgers at Ebbets Field, Brooklyn, announcer Walter L. "Red" Barber or Bill Stern (sources differ), on W2XBS.

Sept. 30, 1939. First televised college football game, Fordham vs Waynesburg, at Randall's Island, New York, on W2XBS.

Oct. 22, 1939. First NFL game is televised by W2XBS: Brooklyn Dodgers vs Philadelphia Eagles at Ebbets Field in Brooklyn. Play by play announcer was Allen (Skip) Walz.

Nov. 10, 1939. W2XB (or W2XD?) (WRGB)* Schenectady NY (became WRGB in 1942, on ch. 3 (?), moved from ch. 4 to ch. 6 in 1954).

Jan. 1940. The FCC holds public hearings on television.

Feb. 1, 1940. The first NBC network television program, from W2XBS to Schenectady.

Feb. 25, 1940. First hockey game televised, Rangers vs Canadians, on W2XBS, from Madison Square Garden.

Feb. 26, 1940. The first quiz show, Spelling Bee, on WRGB.

Feb. 28, 1940. FCC announces a limited commercial television service will be authorized beginning on September 1. Standards were not set, pending further research until the best system could be determined. (Two days later the FCC suspended its authorization for commercial service, declaring that the marketing campaign of RCA disregarded the commission's findings and recommendations.)

Feb. 28, 1940. First basketball game televised, from Madison Square Garden, Fordham vs the University of Pittsburgh, by W2XBS.

Mar. 10, 1940. W2XBS utilizes the Metropolitan Opera to broadcast a scene from an opera from its television studio. The audio portion is carried over radio station WJZ.

Mar. 15, 1940. *Broadcasting* reports RCA cuts price of television sets, starts sales drive intended to put a minimum of 25,000 in homes in service area of NBC's New York video station.

Apr. 1, 1940. *Broadcasting* reports FCC suspends order for "limited commercial" operation of TV, censures RCA for sales efforts which are seen as an attempt to freeze TV standards at present level, calls new hearing; critics call move "usurpation of power."

Apr. 13, 1940. W2XWV (WABD) licensed to DuMont.

June 1940. W2XBS (NBC) covers the Republican National Convention from Philadelphia for 33 hours over five days.

Aug. 1940. W9XBK (WBKB)* Chicago (Balaban & Katz/Paramount).

Aug. 29, 1940. Peter Goldmark of CBS announces his invention of a color TV system.

Sept. 3, 1940. First showing of high definition color TV, by W2XAB, transmitting from the Chrysler Building, using 343 lines. This was the first telecast of any kind from CBS since the closing of their scanner station 2/2/33.

1941. W6XYZ (KTLA)* Los Angeles.

1941. The following stations are listed with 1941 start dates in the 1950 *Broadcasting Yearbook*: ch. 4, WBKB, Chicago, IL; ch. 2, WCBS-TV, New York, NY; ch. 3, WPTZ, Philadelphia, PA.

Mar. 1, 1941. *New York Times* lists: Television Sight: 51.25, Sound 55.75; W2XBS 2-5 p.m. test pattern; 730-830 p.m. test pattern; 830 p.m. pick up of... track meet, Madison Square Garden

Mar. 8, 1941. NTSC formally recommends TV standards to the FCC, calling for 525 lines and 30 frames per second.

Apr. 30, 1941. The FCC approves the NTSC standards and authorizes commercial TV to begin on July 1.

May 2, 1941. 10 stations granted commercial TV licenses effective July 1. Stations were required to broadcast 15 hours per week. W2XBS received license number 1.

June 30, 1941. *Broadcasting* reports Bulova Watch Co., Sun Oil Co., Lever Bros. Co. and Procter & Gamble sign as sponsors of first commercial telecasts on July 1 over WNBT New York.

July 1, 1941. Commercial TV authorized.

July 1, 1941 W2XBS New York NY becomes a commercial station, changes call to WNBT (later calls WRCA-TV, WNBC-TV). At 1:29 p.m., General Mills sponsors a Brooklyn Dodgers-Philadelphia Phillies game, followed by the "Sunoco Newscast" with Lowell Thomas. At 9:15 p.m., "Uncle Jims Question Bee," hosted by Bill Slater and sponsored by Spry, made its one-and-only appearance and, at 9:30, Ralph Edwards hosted "Truth Or Consequences," simulcast on radio and TV and sponsored by Ivory Soap. This was the first game show broadcast on TV. The world's first (legal) TV commercial for Bulova watches occurs at 2:29:10 superimposed over a test pattern. [According to microfiche records at the FCC, WNBT was granted a C.P. on 6/17/41 for Channel 1 (50-56 mhz.), effective 7/1/41. License to cover the C.P. granted 6/17/41, eff. 7/1/41. First operation was granted to be effective 7/1/41. The first listed call letters were WNBT. They changed to WRCA on 10/18/54 and to WNBC on 5/22/60.]

July 1, 1941. CBS station in New York changes call to WCBW (later call WCBS-TV), goes on the air with the first news telecast at 2:30 p.m. This was the station's first actual programming other than test patterns and the color demo. At 3:25 p.m., WCBW broadcasts "Jack and the Beanstalk," narrated by Lydia Perera, Ann Francis and animator John Rupe. Mr. Rupe drew cartoons to accentuate the narrative in a program that ran each afternoon for the first several months of the stations operation. [According to microfiche records at the FCC, WCBW was granted a C.P. on 6/24/41 for Channel 2 (60-66 mhz). Program tests authorized to commence on 7/1/41. License to cover the C.P. granted 3/10/42. The date of first operation is shown as 10/29/41. The first listed call letters were WCBW. They changed to WCBS on 11/1/46.]

July 1, 1941. W3XE Philadelphia becomes WPTZ Philadelphia PA (later call KYW-TV). The station was then off during the war. (However *Broadcasting* magazine and the 1946 *Broadcasting Yearbook* give Sept. 1941 as the date for

WPTZ.)

July 1, 1941. *New York Times* lists: WNBT, (2) WCBW, (4) W2XWV

Aug. 7, 1941. The first audience-participation program, a program of charades, is broadcast on WNBT.

Oct. 12, 1941. *New York Times* lists: (1) WNBT, (2) WCBW

1942. The following stations are listed with 1942 start dates in the 1950 *Broadcasting Yearbook*: ch. 5, KTLA-TV, Hollywood, CA

Jan. 6, 1942. FCC grants permission to Du Mont Laboratories to build a commercial TV station, to operate on 78-84 MHz (then channel 4).

Mar. 1, 1942. W2XB Schenectady changes call to WRGB (for Walter R. G. Baker, GE executive.)

Mar. 1, 1942. *New York Times* lists (1) WNBT

Apr. 13, 1942. *Broadcasting* reports minimum program time required of TV stations is cut from 15 hours to four hours a week for war period.

June 28, 1942. [This is the date WABD was established according to the 1946 *Broadcasting Yearbook*. Station would have been W2XWV at the time. However apparently programs for W2XWV were listed in the *New York Times* before this date.]

Oct. 13, 1943. WBKB* Chicago

Sept. 19, 1943. *New York Times* lists: (4) W2XWV

Nov. 7, 1943. *New York Times* lists: (4) W2XWV

Dec. 23, 1943. The first complete opera, Hansel and Gretel, is telecast, by WRGB Schenectady.

Jan. 2, 1944. *New York Times* lists: (4) W2XWV

May 1, 1944. *Broadcasting* reports CBS proposes starting off postwar TV with high-definition, full-color pictures, broadcast on 16 MHz bands.

May 2, 1944. W2XWV becomes a commercial station, changes call to WABD New York NY (later calls WNEW-TV, WNYW-TV). At 9 p.m. station broadcasts "Your World Tomorrow," a 30-minute show consisting of news about World War II and entertainment segments featuring singer Jessica Dragonette. The program was sponsored by Dun22 Plastics. [According to microfiche records at the FCC, WABD was granted a C.P. on 5/2/44 for Channel 4 (78-84 mhz.) License to cover the C.P. granted on 5/2/44. The first listed call letters were WABD. Call changed to WNEW on 9/7/58.]

May 22, 1944. *Broadcasting* reports single ownership of five TV stations is permitted by FCC, up from former limit of three.

Oct. 2, 1944. *Broadcasting* reports FCC opens hearings on postwar allocations with testimony of Radio Technical Planning Board that agreement had been reached to recommend the 41-56 MHz band for FM, TV allocations to extend upwards from there.

Oct. 9, 1944. *Broadcasting* reports CBS, in testimony presented by Paul Kesten, executive vice president, asks for more space for FM, with TV being moved to UHF part of spectrum above 300 MHz.

1945. The following stations are listed with 1945 start dates in the 1950 *Broadcasting Yearbook*: ch. 5, WTTG,

Washington, DC

Jan. 15, 1945. FCC announces allocations proposal for spectrum above 25 MHz: 44-50 Television; 50-54 Amateur; 54-84 Television 84-88 Educational FM broadcasting; 88-102 Commercial FM broadcasting; 102-108 (Non-Government but not yet determined).

May 21, 1945. FCC announces allocation of spectrum above 25 MHz with exception of 44-108 MHz but delays decision as to placement of FM for propagation studies to be made by FCC and industry engineers. The 44-108 MHz spectrum is to be allocated, following tests, on one of the following three alternatives:

Alternative 1: 44- 48 Amateur; 48-50 Facsimile; 50-54 Educational FM broadcasting; 54-68 Commercial FM broadcasting; 68-74 Television; 74-78 Non-Government fixed & mobile -aero markers on 75 MHz to remain as long as required; 78-108 Television, fixed, mobile [shared].

Alternative 2: 44-56 Television; 56-60 Amateur [the same as pre-WW2]; 60-66 Television; fixed; mobile [shared]; 66-68 Facsimile; 68-72 Educational FM broadcasting; 72-86 Commercial FM broadcasting. aero markers remain on 75 MHz as long as required; 86-92 Television; 92-104 Television, fixed, mobile [shared]; 104-108 Non-Government fixed and mobile.

Alternative 3: 44-50 Television, fixed, mobile [shared] 50-54 Amateur; 54-78 Television, fixed, mobile [shared] aero markers remain on 75 MHz as long as required; 78-84 Television; 84-88 Educational FM broadcasting; 88-102 Commercial FM broadcasting; 102-104 Facsimile; 104-108 Non-Government fixed and mobile.

June 4, 1945. *Broadcasting* reports in joint request, FM Broadcasters Inc. and Television Broadcasters Association ask FCC to allocate 44-108 MHz immediately: FM to get 50-54 MHz for educational use, 54-68 MHz for commercial operation; TV to receive 68-74 MHz and 78-108 MHz.

June 27, 1945. FCC allocates 88-92 educational FM; 92-106 commercial FM; 106-108 facsimile broadcasting; 92.1-93.9 community; 94.1-103.9 metro; 104.1-105.9 rural; TV channel 1 44-50; TV channel 2-6 according to the present scheme.

Aug. 9, 1945. WABD New York and WTTG Washington are linked for a network broadcast, according to Alan E. Ruitter, biographer of Allen B. Dumont.

Sept. 20, 1945. WABD(TV) signs off, channel 4, 78-84 MHz; plans to return Dec. 15 on channel 5, 76-82 MHz

Sept. 24, 1945. *Broadcasting* reports FCC distributes 13 VHF channels among 140 markets

1946. The beginning of network television as WNBT begins feeding its programs to Philadelphia and Schenectady on a more-or-less regular basis. (Some programs were fed from New York to both cities as early as 1941.)

Jan. 15, 1946. A directory of U. S. commercial television stations as of this date (from the 1946 *Broadcasting Yearbook* lists:

WBKB	Chicago	66-72 MHz now; channel 4 on Mar. 1	Established 1943
WABD	New York	78-84 MHz now; channel 5 on Mar. 1	Established June 28, 1942
WCBW	New York	60-66 MHz now; channel 2 on Mar. 1	Established July 1, 1941
WNBT	New York	50-56 MHz now; channel 4 on Mar. 1	Established July 1, 1941
WRGB	Schenectady	66-72 MHz now; channel 4 on Mar. 1	Established Nov. 10, 1939
WPTZ	Philadelphia	66-72 MHz now; channel 3 on Mar. 1	Established Sept. 1941
KTSL	Hollywood	50-56 MHz now; undesignated on Mar. 1	Has CP
WTZR	Chicago	50-56 MHz now; undesignated on Mar. 1	Has CP

WMJT	Milwaukee	66-72 MHz now; undesignated on Mar. 1	Has CP
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Jan. 17, 1946. W18XGZ Charleston seeks license to cover experimental TV (Zaharis)

Jan. 31, 1946. WTZR* Chicago IL (Zenith).

Feb. 4, 1946. *Broadcasting* reports CBS demonstrates color-television film program broadcast from its new UHF transmitter; says with industry cooperation color for the home can be available within a year.

Feb. 18, 1946. *Broadcasting* reports first Washington-New York telecast through AT&T coaxial cable is termed success by engineers and viewers.

Feb. 25, 1946. New TV channel assignments go into effect; among the changes: WCBW from 60-66 to (2) and WNBT from 50-56 to (4).

Mar. 1, 1946. Modern channel allocation system goes into effect with channel 1 44-50 MHz, channel 2 54-60 MHz, etc.; WCBW(TV) and WNBT(TV) go off the air for channel conversions (WNBT resumes May 9 on channel 4)

Apr. 22, 1946. *Broadcasting* reports CBS color-television program is successfully transmitted over 450-mile coaxial cable link from New York to Washington and back.

May 9, 1946. First variety show premieres, *Hour Glass*, on NBC. The show ran 10 months.

June 19, 1946. First televised heavyweight title fight (Joe Louis vs Billy Conn), broadcast from Yankee Stadium, is seen by the largest television audience to see a fight. 141,000.

Sept. 6, 1946. W9XBK changes its call to WBKB(TV) Chicago IL, ch. 4 (later ch. 2; later call WBBM-TV).

Sept. 30, 1946. *Broadcasting* reports CBS petitions FCC to adopt standards and authorize commercial operation of color-television stations in UHF frequencies immediately.

Oct. 1, 1946. *New York Times* lists (2) WCBW, (4) WNBT, (5) WABD

Oct. 2, 1946. *Faraway Hill* airs on the DuMont network, becoming the first TV network soap opera.

Nov. 1946. WTTG* Washington (DuMont), according to one source; however, the 1954 *Telecasting Yearbook* gives Jan. 1 1947 and *Broadcasting* magazine gives January 1947. The call stands for Thomas T. Goldsmith, DuMont's chief engineer. (Station was originally W3XWT. Starting May 28, 1945, it had given test pattern and recorded announcements asking for reception reports. None was received for 3 months. The U. S. Navy finally picked it up while monitoring for "suspicious" radio signals.)

Nov. 1, 1946. WCBW changes call to WCBS-TV.

Nov. 4, 1946. *Broadcasting* reports RCA demonstrates all-electronic system of color TV.

Nov. 11, 1946. *Broadcasting* reports Bristol-Myers is the first advertiser to sponsor a television-network program, *Geographically Speaking*, which started Oct. 27 on NBC-TV's two-station network.

Dec. 24, 1946. The first church service telecast, Grace Episcopal Church in New York, on WABD on the New York-Philadelphia-Washington network.

1947. The following stations are listed with 1947 start dates in the 1950 *Broadcasting Yearbook*: ch. 4, WNBW, Washington, DC; ch. 7, WMAL-TV, Washington, DC; ch. 2, WMAR-TV, Baltimore, MD; ch. 4, WWJ-TV, Detroit, MI; ch. 5, KSD-TV, St. Louis, MO; ch. 5, WABD, New York, NY; ch. 5, WEWS, Cleveland, OH; ch. 6, WFIL-TV,

Philadelphia, PA; ch. 3, WTMJ-TV, Milwaukee, WI

Jan. 22, 1947. W6XYZ changes call to KTLA(TV)* (5), first commercial TV west of Chicago. A 30-minute show is telecast from the Paramount TV stage, featuring Bob Hope, Jerry Colonna, Dorothy Lamour, and William Bendix. The FCC microfiche records show the station was granted a Special Temporary Authorization for commercial operation on 1/9/47 and that the date of its first commercial license was 2/9/53.

Jan. 30, 1947. The FCC declares that the CBS color system is "premature" and requires further testing before it could be approved.

Feb. 8, 1947. KSD-TV* St. Louis MO, ch 5.

Mar. 4, 1947. WWDT (WWJ-TV) Detroit MI, ch 4, experimental (regular programs June 3).

Mar. 24, 1947. *Broadcasting* reports FCC denies CBS petition for commercial color-TV operation, sends color back to labs for continued search for "satisfactory" system.

May 7, 1947. *Kraft Television Theater* premieres on NBC, the first regularly scheduled drama series on a network.

June 27, 1947. WNBW-TV (WRC-TV)* Washington DC (was W3XNB).

Sept. 13, 1947. WFIL-TV* Philadelphia PA, ch. 6.

Sept. 30, 1947. The opening game of the World Series is the first World Series game to be telecast, between the New York Yankees and the Brooklyn Dodgers at Yankee Stadium. The game was carried by WABD, WCBS-TV, and WNBT in New York, and was also telecast in Philadelphia, Schenectady, and Washington. The 1947 World Series brought in television's first mass audience, and was seen by an estimated 3.9 million people, mostly in bars [Tim Brooks].

Oct. 3, 1947. WMAL-TV (WJLA-TV)* Washington DC, ch. 7, the first VHF high band station.

Oct. 5, 1947. First presidential address telecast from the White House: Truman speaks about food conservation and the world food crisis, proposing meatless Tuesdays and eggless and poultry-less Thursdays

Oct. 17, 1947. WEWS* Cleveland OH.

Oct. 27, 1947. WMAR-TV* Baltimore MD, ch. 2.

Nov. 6, 1947. *Meet the Press* first appears as a local program in Washington.

Nov. 17, 1947. *Broadcasting* reports television network service extends to Boston with the opening of AT&T radio relay system between that city and New York.

Nov. 20, 1947. *Meet the Press* first network telecast. (Became a weekly program on Sept. 12, 1948.)

Dec. 3, 1947. WTMJ-TV* Milwaukee WI, ch. 3 (later ch. 4) (previous experimental operation as W9XMJ and W9XD.)

Dec. 17, 1947. WEWS* Cleveland OH, ch. 5.

Dec. 27, 1947. *Puppet Television Theater* (later called *Howdy Doody Time*), debuts on NBC TV with Buffalo Bob Smith. It was carried by six stations.

1948. The following stations are listed with 1948 start dates in the 1950 *Broadcasting Yearbook*: ch. 9, KFI-TV, Los Angeles, CA; ch. 13, KLAC-TV, Los Angeles, CA; ch. 5, KPIX, San Francisco, CA; ch. 6, WNHC-TV, New Haven, CT; ch. 8, WSB-TV, Atlanta, GA; ch. 7, WENR-TV, Chicago, IL; ch. 9, WGN-TV, Chicago, IL; ch. 5, WAVE-TV, Louisville, KY; ch. 6, WDSU-TV, New Orleans, LA; ch. 4, WBZ-TV, Boston, MA; ch. 7, WNAC-TV, Boston, MA; ch.

11, WBAL-TV, Baltimore, MD; ch. 13, WAAM, Baltimore, MD; ch. 7, WXYZ-TV, Detroit, MI; ch. 5, KSTP-TV, St. Paul, MN; ch. 13, WATV, Newark, NJ; ch. 4, KOB-TV, Albuquerque, NM; ch. 4, WBEN-TV, Buffalo, NY; ch. 7, WJZ-TV, New York, NY; ch. 11, WPIX, New York, NY; ch. 8, WHEN, Syracuse, NY; ch. 4, WLWT, Cincinnati, OH; ch. 4, WNBK, Cleveland, OH; ch. 13, WSPD-TV, Toledo, OH; ch. 10, WCAU-TV, Philadelphia, PA; ch. 4, WMCT, Memphis, TN; ch. 5, WBAP-TV, Fort Worth, TX; ch. 4, KDYL-TV, Salt Lake City, UT; ch. 6, WTVR, Richmond, VA; ch. 5, KING-TV, Seattle, WA

[WLWT was previously W8XCT.]

1948. ABC broadcasts the series *On the Corner* on four stations. ABC considers this its first network show, although an earlier show, *Play the Game*, produced by ABC using DuMont's facilities, was seen on a network.

1948. CBS begins network programming.

Jan. 1, 1948. *New York Times* lists: (2) WCBS-TV, (4) WNBT, (5) WABD.

Jan. 18, 1948. The Original Amateur Hour with Ted Mack debuts.

Feb. 9, 1948. WLWT(TV)* Cincinnati OH, ch. 4 (later ch. 5).

Mar. 1, 1948. WCAU-TV* Philadelphia PA (was W3XAU).

Mar. 11, 1948. WBAL-TV* Baltimore MD, ch. 11.

Mar. 15, 1948. WCAU-TV* Philadelphia PA, ch. 10.

Apr. 5, 1948. WGN-TV* Chicago IL, ch. 9.

Apr. 22, 1948. WTVR (WTVR-TV)* Richmond VA, ch. 6.

Apr. 27, 1948. KSTP-TV* St. Paul-Minneapolis MN, ch. 5.

May 6, 1948. KTSL(TV)* (KNXT) Los Angeles CA, ch. 2.

May 10, 1948. *Broadcasting* reports FCC orders into effect earlier proposal assigning TV ch. 1 (44-50 mc) to nongovernmental fixed and mobile services, denying FM spokesmen's pleas for that channel for use in FM network relaying; gives FM stations in 44-50 mc band until end of year to move to 88-108 mc; issues proposed new expanded TV allocation table; calls hearing on feasibility of TV use of frequencies above 475 mc; proposes required minimum hours of TV station operation be scaled from 12 hours a week for first 18 months to 28 hours a week after 36 months.

May 14, 1948. WBEN-TV* Buffalo NY, ch. 4.

May 15, 1948. WATV(TV)* (WNTA-TV, WNDT-TV, WNET-TV)* Newark NJ. [According to an Internet web page, WATV began licensed operations on Jan. 2 1948.]

June 8, 1948. Milton Berle Show premieres on NBC.

June 9, 1948. WBZ-TV* Boston MA, ch. 4.

June 15, 1948. WPIX-TV* New York NY, ch. 11; WNHC-TV* New Haven (ch. 6, moved to channel 8 in December, 1953; became WTNH in 1972) (was affiliated with NBC, CBS with a little ABC and DuMont programming as well; exclusively an ABC affiliate since September, 1955)

June 20, 1948. *Toast of the Town*, with Ed Sullivan, premieres on CBS, with guests Dean Martin and Jerry Lewis. (The name was changed to the *Ed Sullivan Show* on September 18, 1955.)

June 21, 1948. First network telecast of political conventions; both parties meet in Philadelphia that year; telecasts reach cities connected to network lines with Philadelphia. NBC sends edited kinescope recordings for next-day telecasts on those stations not yet connected to the network.

June 21, 1948. WNAC-TV (WNEV-TV, WHDH)* Boston MA, ch. 7.

July 21, 1948. WSPD-TV* Toledo OH, ch. 13.

July 30, 1948. Professional wrestling premieres on prime-time network TV (DuMont).

July 1, 1948. KDYL-TV (KCPX-TV)* Salt Lake City UT, ch. 4.

Aug. 10, 1948. WJZ-TV (WABC-TV)* New York NY, ch. 7, 7 p.m. The first broadcast originated from the Palace Theater on Broadway with a four-hour show. The opening act was Carlton Emmys dog act, followed by stars such as Ray Bolger, Beatrice Lillie, Pat Rooney, Ella Logan, James Barton, Willie West and McGinty, Buck and Bubbles, Walter "Dare" Wahl, Gus Van, Henry Morgan, Raye and Naldi, and Paul Whiteman and his orchestra.

Aug. 10, 1948. *Candid Camera* debuts on ABC.

Aug. 15, 1948. The first network nightly newscast, CBS-TV News, debuts on CBS with Douglas Edwards.

Aug. 25, 1948. KSEE (KFI-TV, KHJ-TV)* Los Angeles CA, ch. 9 (was W6XEA). However another source says KHJ-TV went on the air as KFI-TV on Oct. 6, 1948.

Aug. 27, 1948. Whitaker Chambers, appearing on *Meet the Press*, accuses Alger Hiss of being a communist.

Sept. 21, 1948. *Texaco Star Theater*, with Milton Berle, premieres on NBC (or Sept. 14)

Sept. 17, 1948. KLAC-TV* (KCOP-TV)* Los Angeles CA, ch. 13; WENR-TV (WBKB-TV, WLS-TV)* Chicago IL, ch. 7.

Sept. 29, 1948. WSB-TV* Atlanta GA, ch. 8. (With the merger in 1951 of *Atlanta Constitution* into *Atlanta Journal*, Cox took over the ch. 2 facility of *Constitution* and sold channel 8 to Broadcasting, Inc.)

Sept. 29, 1948. WBAP-TV* Fort Worth TX, ch. 5.

Sept. 30, 1948. FCC freezes new TV applications; channel 1 deleted, assigned to land mobile

Oct. 8, 1948. WNBY (WNBQ, WMAQ-TV)* Chicago, first telecast (a World Series game). *Broadcasting* magazine says WNBQ went on the air Sept. 1, 1948.

Oct. 9, 1948. WXYZ-TV* Detroit MI, ch. 7.

Oct. 24, 1948. WJBK-TV* Detroit MI, ch. 2.

Oct. 31, 1948. WNBK (KYW-TV, WKYC-TV)* Cleveland OH, ch. 4 (later ch. 3).

Nov. 2, 1948. WAAM-TV (WJZ-TV)* Baltimore MD, ch. 13.

Nov. 24, 1948. WAVE-TV* Louisville KY, ch. 5 (later ch. 3).

Nov. 25, 1948. KRSC-TV (KING-TV)* Seattle WA, ch. 5.

Nov. 27, 1948. WDTV (KDKA-TV)* Pittsburgh sends out its first signal, ch. 3 (although Jan. 11, 1949, is considered the start date below).

Nov. 29, 1948. KOB-TV* Albuquerque NM, ch. 4; Kukla, Fran and Ollie debuts on NBC. (Show had previously aired on WBKB Chicago as Junior Jamboree beginning Oct. 13, 1947.)

Dec. 1, 1948. WHEN-TV* Syracuse NY, ch. 8 (moved to ch. 5 in July 1961)

Dec. 11, 1948. WMCT (WMC-TV)* Memphis TN, ch. 4 (later ch. 5).

Dec. 18, 1948. WDSU-TV* New Orleans LA, ch 6. 6 p.m.

Dec. 22, 1948. KGO-TV* San Francisco CA.

Dec. 24, 1948. The first Catholic midnight mass is telecast by WNBT, WJZ-TV, and WCBS-TV.

1949. The following stations are listed with 1949 start dates in the 1950 *Broadcasting Yearbook*: ch. 4, WBRC-TV, Birmingham, AL; ch. 13, WAFM-TV, Birmingham, AL; ch. 5, KPHO-TV, Phoenix, AZ; ch. 4, KNBH, Los Angeles, CA; ch. 7, KECA-TV, Los Angeles, CA; ch. 11, KTTV, Los Angeles, CA; ch. 8, KFMB-TV, San Diego, CA; ch. 4, KRON-TV, San Francisco, CA; ch. 7, KGO-TV, San Francisco, CA; ch. 9, WOIC, Washington, DC; ch. 7, WDEL-TV, Wilmington, DE; ch. 4, WMBR-TV, Jacksonville, FL; ch. 4, WTVJ, Miami, FL; ch. 5, WAGA-TV, Atlanta, GA; ch. 5, WOC-TV, Davenport, IA; ch. 5, WNBQ, Chicago, IL; ch. 10, WTTV, Bloomington, IN; ch. 6, WFBM-TV, Indianapolis, IN; ch. 2, WJBK-TV, Detroit, MI; ch. 7, WLAV-TV, Grand Rapids, MI; ch. 4, WTCN-TV, Minneapolis, MN; ch. 4, WDAF-TV, Kansas City, MO; ch. 3, WBTW, Charlotte, NC; ch. 2, WFMY-TV, Greensboro, NC; ch. 3, KMTV, Omaha, NE; ch. 6, WOW-TV, Omaha, NE; ch. 12, WNBF-TV, Binghamton, NY; ch. 9, WOR-TV, New York, NY; ch. 6, WHAM-TV, Rochester, NY; ch. 7, WCPO-TV, Cincinnati, OH; ch. 7, WKRC-TV, Cincinnati, OH; ch. 3, WLWC, Columbus, OH; ch. 6, WTVN, Columbus, OH; ch. 10, WBNS-TV, Columbus, OH; ch. 5, WLWD, Dayton, OH; ch. 13, WHIO-TV, Dayton, OH; ch. 4, WKY-TV, Oklahoma City, OK; ch. 6, KOTV, Tulsa, OK; ch. 12, WICU, Erie, PA; ch. 13, WJAC-TV, Johnstown, PA; ch. 4, WGAL-TV, Lancaster, PA; ch. 3, WDTV, Pittsburgh, PA; ch. 11, WJAR-TV, Providence, RI; ch. 4, KRLD-TV, Dallas, TX; ch. 8, KBTW, Dallas, TX; ch. 2, KLEE-TV, Houston, TX; ch. 4, WOAI-TV, San Antonio, TX; ch. 5, KSL-TV, Salt Lake City, UT; ch. 5, WSAZ-TV, Huntington, WV

Jan. 1, 1949. KLEE-TV (KPRC-TV)* Houston TX, ch. 2; KTTV* Los Angeles.

Jan. 3, 1949. Colgate Theatre premieres on NBC.

Jan. 10, 1949. The Goldbergs premieres on CBS.

Jan. 11, 1949. A two-hour special on all networks celebrates the linking of eastern and midwestern networks via coaxial cable; WDTV (KDKA-TV)* Pittsburgh PA, ch. 3 (later ch. 2).

Jan. 16, 1949. KNBH (KRCA, KNBC)* Los Angeles CA; WOIC (WTOP-TV)* Washington DC.

Jan. 17, 1949. *Broadcasting* reports AT&T coaxial cable links East Coast and Midwest television stations.

Jan. 31, 1949. *Broadcasting* reports first Emmy awards ceremony is held, and broadcast by KTSL(TV) Los Angeles.

Feb. 23, 1949. WHIO-TV* Dayton OH, ch. 13 (later ch. 7).

Mar. 8, 1949. WAGA-TV* Atlanta GA.

Mar. 15, 1949. WLWD (WDTN-TV)* Dayton OH, ch. 5 (later ch. 2); WICU-TV* Erie PA, ch. 12.

Mar. 18, 1949. WGAL-TV* Lancaster PA, ch 4 (later ch. 8).

Mar. 21, 1949. WTVJ(TV)* Miami FL.

April 1949. KTLA Los Angeles broadcasts 27 hours and 30 minutes of live coverage of the effort to rescue three-year-old Kathy Fiscus, who had fallen into a well. The event gripped Los Angeles and stimulated sales of TV sets in the city.

Apr. 3, 1949. WLWC* Columbus OH, ch. 3 (later ch. 4).

Apr. 4, 1949. WKRC-TV* Cincinnati OH, ch. 11 (later ch. 12).

May 1949. The first telethon, benefitting the Damon Runyon Cancer Fund, is hosted by Milton Berle. It aired for 24 hours.

May 5, 1949. KGO-TV* San Francisco CA.

May 9, 1949. *Broadcasting* reports FCC authorizes NBC to operate a UHF station at Bridgeport CT for experimental rebroadcasts of programs of WNBT New York.

May 16, 1949. KFMB-TV* San Diego CA; Milton Berle appears on the covers of both Time and Newsweek.

May 22, 1949. WAFM-TV (WABT, WAPI-TV)* Birmingham AL.

May 30, 1949. WFBM-TV* Indianapolis IN, ch. 6 *Broadcasting* reports longest direct TV pickup, 129 miles, is made by KFMB-TV San Diego during dedication when it got and rebroadcast salute from KTLA(TV) Los Angeles without special equipment of any kind.

June 1, 1949. KSL-TV* Salt Lake City UT, ch. 5.

June 6, 1949. WKY-TV* Oklahoma City OK, ch. 4.

June 11, 1949. WHAM-TV (WROC-TV)* Rochester NY, ch. 6 (later ch. 5, and later in a trade to ch. 8).

June 27, 1949. *Captain Video* debuts on DuMont.

July 1, 1949. WBRC-TV* Birmingham AL ch. 4 (to ch. 6 in 1953); WTCN-TV (WCCO-TV)* Minneapolis-St. Paul MN, ch. 4.

July 10, 1949. WJAR-TV* Providence RI, ch. 11 (later ch. 10).

July 11, 1949. FCC announces TV allocation plan; to add 42 UHF channels to the present 12 VHF channels, with another 23 to 28 UHF channels reserved for experimental television, providing for 2,245 TV stations in 1400 communities.

July 15, 1949. WBTV* Charlotte NC, ch. 3.

July 18, 1949. WJAR-TV* Providence ch. 11 (moved to ch. 10 in May 1953).

July 26, 1949. WCPO-TV* Cincinnati OH, ch. 7 (later ch. 9).

Aug. 15, 1949. WLAV-TV (WOOD-TV)* Grand Rapids MI, ch. 7 (later ch. 8).

Aug. 25, 1949. RCA announces the development of a compatible color TV system.

Aug. 29, 1949. WOW-TV* Omaha NE, ch. 6.

Aug. 30, 1949. WTVN-TV* Columbus OH, ch. 6.

Sept. 1, 1949. KMTV* Omaha NE, ch. 3.

Sept. 15, 1949. WMBR-TV (WJXT)* Jacksonville FL, ch. 4; WJAC-TV* Johnstown PA, ch. 13 (later ch. 6).

Sept. 16, 1949. KECA-TV (KABC-TV)* Los Angeles.

Sept. 17, 1949. KBTW (WFAA-TV)* Dallas TX, ch. 8.

Sept. 22, 1949. WFMY-TV* Greensboro NC, ch. 2.

Oct. 5, 1949. WBNS-TV* Columbus OH, ch. 10.

Oct. 6, 1949. The *Ed Wynn Show* becomes the first regularly scheduled network show to broadcast from the West Coast, where it is seen live.

Oct. 11, 1949. WOR-TV (WWOR-TV)* New York NY, ch. 9 (was W2XBB; later to Secaucus NJ). An Internet web page says the inaugural broadcast was Oct. 11 1949 and began at 7 p.m., with soprano Joan Roberts accompanied by an off-stage pianist in the 15-minute "Joan Roberts Show." That was followed by "Apartment 3C," a domestic comedy starring John and Barbara Gay and the "John Reed King Show," a giveaway sponsored by Flagstaff Foods, "The Handy Man," featuring Jack Creamer with tips for homemakers. Then "The Barry Gray Show" with guests Myron Cohen, Irving Caesar, Tony Canzoneri, the Di Castro Sisters and Hope Miller with interviews conducted from the roof studio at the New Amsterdam Theater.

Oct. 14, 1949. WSAZ-TV Huntington WV 1st test pattern, channel 5 (regular programming begins Oct. 24)

Oct. 16, 1949. WDAF-TV* Kansas City MO, ch. 4.

Oct. 22, 1949. KOTV* Tulsa OK, ch. 6.

Oct. 31, 1949. WOC-TV (KWQC)* Davenport IA, ch 5 (later ch. 6).

Nov. 11, 1949. WTTV* Bloomington-Indianapolis IN, ch. 10 (later ch. 4).

Nov. 15, 1949. KRON-TV* San Francisco CA; WSAZ-TV* Huntington WV, ch. 5 (later ch. 3).

Dec. 1, 1949. WNBF-TV* Binghamton NY, ch. 12; WKTV* Utica NY, ch 13 (later ch. 2).

Dec. 3, 1949. KRLD-TV (KDFW-TV)* Dallas TX, ch. 4.

Dec. 4, 1949. KPHO-TV* Phoenix AZ.

Dec. 11, 1949. WOAI-TV* San Antonio TX, ch. 4.

Dec. 19, 1949. WXEL (WJW-TV)* Cleveland OH, ch. 9 (later ch. 8).

Dec. 29, 1949. KC2XAK, first experimental UHF TV station operating on a regular basis is opened by NBC at Bridgeport CT on 529-535 MHz.

Feb. 2, 1950. *What's My Line* debuts on CBS.

Feb. 15, 1950. WSYR-TV* Syracuse NY, ch. 5 (later ch. 3); KEYL (KGBS-TV, KENS-TV)* San Antonio TX, ch. 5.

Feb. 21, 1950. WOI-TV* Ames IA, ch 4 (later channel 5).

Feb. 25, 1950. Your Show of Shows premieres on NBC.

Mar. 27, 1950. WHAS-TV* Louisville KY, ch. 9 (later ch. 11). [According to a [history of WHAS](#), the station originally operated with 9600 watts, but increased power to 50 kW visual on Aug. 7, 1951, the first TV station to broadcast with this much visual power. On Feb. 7, 1953, the station moved to Channel 11 and became the nation's first station with 316,000 watts visual ERP.]

Apr. 2, 1950. WTAR-TV* Norfolk VA, ch. 4 (later ch. 3).

May 1, 1950. WJIM-TV* Lansing MI, ch. 6.

May 29, 1950. *Broadway Open House* debuts.

June 1, 1950. WKZO-TV* Kalamazoo MI, ch. 3.

July 1, 1950. WHBF-TV* Rock Island IL, ch. 4.

July 10, 1950. *Your Hit Parade* premieres on NBC.

Sept. 4, 1950. *Broadcasting* reports FCC states it will adopt the CBS color-television system unless set makers agree to "bracket standards" to enable sets to receive both present 525-line pictures and the 405-line images proposed by CBS; if they agree, commission will adopt "bracket standards" for black-and-white TV and postpone color decision.

Sept. 30, 1950. WSM-TV* Nashville TN, ch. 4.

Oct. 10, 1950. The FCC approves CBS color TV system, effective Nov. 20. CBS promises 20 hours of color programs a week within two months. RCA continues work on its compatible system. Manufacturers are divided as to whether to make sets and converters to receive CBS colorcasts.

Mar. 26, 1951. *Broadcasting* reports FCC reveals proposed allocation plan making full use of UHF band in addition to 12 VHF channels to provide for some 2,000 TV stations in more than 1,200 communities.

May 28, 1951. The U. S. Supreme Court upholds the FCC's approval of the CBS color system.

June 25, 1951. CBS broadcasts color using its non-compatible system. The one-hour program, called *Premiere*, featured Ed Sullivan and other CBS stars, and is carried on a five-station East Coast CBS-TV hookup.

Late June 1951. RCA demonstrates its new electronic color system.

Aug. 11, 1951. First baseball games televised in color, a double-header between the Brooklyn Dodgers and the Boston Braves, by WCBS-TV. Red Barber and Connie Desmond were the announcers.

Sept. 4, 1951. First transcontinental TV broadcast, featuring President Truman.

Sept. 22, 1951. First live sporting event seen coast-to-coast: a college football game between Duke and the University of Pittsburgh, at Pittsburgh (NBC-TV).

Oct. 1, 1951. WLTV (WAIL-TV, WQXI-TV)* Atlanta GA, originally ch. 8, later ch. 11.

Oct. 3, 1951. First live coast-to-coast network telecast of a World Series game (produced by Gillette, aired on NBC, CBS and ABC).

Oct. 15, 1951. *I Love Lucy* premieres on CBS.

Nov. 18, 1951. *See It Now* premieres on CBS, showing live shots of the Statue of Liberty and San Francisco Bay.

Dec. 24, 1951. First televised opera written for television, *Amahl and the Night Visitor*, on NBC.

1952. KTLA makes the first telecast of an atomic bomb detonation. Klaus Landsberg led the engineering feat on short notice that established microwave links that had previously been considered impossible with existing technology. The station fed the coverage to the nation.

Jan. 14, 1952. *Today* show premieres on NBC.

Apr. 14, 1952. FCC lifts TV freeze as of July 1; provides for 617 VHF and 1436 UHF allocations, including 242 non-commercial educational stations; establishes 3 zones with different mileage separation and antenna-height regulations; changes required of 30 TV stations.

Sept. 18, 1952. KPTV(TV)* Portland, the first commercial UHF TV station, transmits its first test pattern, on ch. 27.

Sept. 23, 1952. Richard Nixon's "Checkers" speech is delivered.

Oct. 12, 1952. KBTU(TV)* Denver (9), first post-freeze station in channels 7-13

Dec. 21, 1952. WSBT-TV* South Bend IN. [The station claims to be the longest continuously broadcasting UHF television station in the U. S., and the first UHF station to produce a live telecast.]

Late 1952 to 1954. Numerous TV stations switched channels. This list may not be complete.

CALL	CITY	FROM	TO
WBRC-TV	Birmingham	4	6
WLTU	Atlanta	8	11
WMAZ-TV	Macon	7	13
WBKB or WBBM-TV	Chicago	4	2
WTTU	Bloomington	10	4
WOI-TV	Ames	4	5
WOC-TV	Davenport	5	6
WAVE-TV	Louisville	5	3
WHAS-TV	Louisville	9	11
WLAV-TV	Grand Rapids	7	8
WHAM-TV	Rochester	6	5
WRGB	Schenectady	4	6
WSYR	Syracuse	5	3
WKTV	Utica	13	2
WCPO-TV	Cincinnati	7	9
WKRC-TV	Cincinnati	11	12
WLWT	Cincinnati	4	5

WNBK	Cleveland	4	3
WXEL or WJW-TV	Cleveland	9	8
WLWC	Columbus	3	4
WHIO-TV	Dayton	13	7
WLWD	Dayton	5	2
WJAC-TV	Johnstown	13	6
WDTV	Pittsburgh	3	2
WGAL-TV	Lancaster	4	8
WJAR-TV	Providence	11	10
WMCT	Memphis	4	5
WTAR-TV	Norfolk	4	3
WSAZ-TV	Huntington	5	3
WTMJ-TV	Milwaukee	3	4

Mar. 8, 1953. WFMJ-TV Youngstown begins broadcasting on channel 73, the highest channel so far.

Mar. 25, 1953. CBS concedes victory to RCA in the war over color TV standards.

Apr. 3, 1953. First issue of *TV Guide* is published, with 10 editions and a circulation of 1,562,000 copies.

May 25, 1953. KUHT* Houston, the first non-commercial educational TV station, begins regular programming.

May 29, 1953. *St. Petersburg Times* reports WSUN-TV will go on the air with a half-hour dedication ceremony at 4:15 p.m. May 31 (test patterns are currently being transmitted) channel 38 (to 2/23/70)

Aug. 30, 1953. NBC's *Kukla, Fran, and Ollie Show* is broadcast in color, the first publicly announced experimental network broadcast in compatible color.

Sept. 28, 1953. *Broadcasting* reports that, with the end of daylight saving time, CBS and NBC inaugurate "hot kinescope" systems to put programs on air on the West Coast at same clock hour as in the East.

Oct. 19, 1953. Arthur Godfrey fires Julius La Rosa on the air.

Nov. 22, 1953. RCA tests its compatible color TV system on the air for the first time with a telecast of the *Colgate Comedy Hour*. [or Nov. 23?]

Dec. 17, 1953. FCC reverses its 1951 decision and approves the RCA/NTSC color system. NBC broadcasts the NBC chimes image at 5:31:17 p.m. using NTSC standards. CBS broadcasts the first live color program at 6:15 p.m.; NBC followed with a live program at 6:30 p.m.

Jan. 1, 1954. NBC broadcasts the Rose Parade in color on 21 stations.

Mar. 9, 1954. Edward R. Murrow denounces Sen. Joseph R. McCarthy on *See It Now*.

Apr. 1, 1955. Dumont drastically cuts back its programming; very few Dumont shows stay on the air past this date. By September, 1955, Dumont programming has been reduced to NFL football on Sunday afternoons, boxing on Monday nights, and some college football on Saturday afternoons.

Oct. 17, 1954. WNBC to WRCA AM, FM, TV, at midnight; KNBH(TV) to KRCA(TV), WNBW(TV) to WRC-TV

Dec. 13, 1954. *Broadcasting* reports WBRE-TV Wilkes-Barre PA is ready to become the first UHF station to use 1,000 KW, maximum ERP authorized by the FCC.

Apr. 18, 1955. *Broadcasting* reports that DuMont switches to a film network, using Electronicam, reserving live relays for special events and sports.

Sept. 28, 1955. First World Series game broadcast in color, by WRCA-TV.

Apr. 1956. WNBQ Chicago replaces all black-and-white equipment with color equipment, becoming first TV station to broadcast all its local programming in color.

Apr. 1956. Ampex demonstrates first practical videotape recorder at NAB Convention in Chicago. The three networks immediately place orders for Ampex VTR's, which begin to arrive later in the year.

July 2, 1956. *Broadcasting* reports FCC uncovers plan for long-range shift of TV to all UHF and, for present, proposes deintermixture in 13 markets.

Aug. 8, 1956. Final telecast of the Dumont network, a boxing card. Although Dumont ceased network operations, the boxing show continued locally in New York until 1958. CBS inherits the rest of the Dumont/NFL football deal, giving the NFL its first-ever true national TV exposure.

Oct. 29, 1956. First use of videotape in network television programming: CBS uses its first Ampex VTR to be installed at Television City, Los Angeles, to record the evening news (then anchored by Douglas Edwards) and in turn, feeds the tape to West Coast stations three hours later. Previously, West Coast rebroadcasts had been done by kinescope recordings.

Oct. 29, 1956. Chet Huntley and David Brinkley take over anchor duties of NBC newscast, which is renamed "The Huntley-Brinkley Report."

Nov. 1956. First use of videotape in production of a network television entertainment program: Jonathan Winters, at the time doing a 15-minute show a couple of nights a week on NBC-TV, uses videotape and superimposing/montage techniques to be able to play two characters in the same skit. During such skits, he tapes the actions and dialogues of one of the two characters he played and did the other live. (His show, except for taped bits to allow him to play two characters, is otherwise done live).

Mar. 16, 1962. Walter Cronkite succeeds Douglas Edwards as anchorman of the *CBS Evening News*.

July 9, 1962. Telstar communications satellite is launched into orbit. [The first test transmissions between the U. S., France, and Britain occurred the next day. This was not actually the first trans-Atlantic TV, as the BBC and German TV were received in the 1930s in Long Island and perhaps elsewhere in the U. S.]

July 23, 1962. A joint ABC/CBS/NBC production is telecast to Europe via Telstar. The program featured excerpts of a baseball game at Wrigley Field, Chicago, a live news conference by President Kennedy, and a concert by the Mormon Tabernacle Choir, who had traveled to Mount Rushmore to perform. The host of the U. S.-to-Europe program was Chet Huntley of NBC.

May 15, 1963. First TV pictures transmitted from a manned U.S. space capsule, astronaut Gordon Cooper's "Faith 7." Because the picture quality is poor, only NBC carries the transmission, and on tape-delay, not live.

Sept. 2, 1963. CBS becomes first network to expand early-evening network news from 15 to 30 minutes.

Sept. 9, 1963. NBC expands early-evening network news to 30 minutes. (ABC did not follow until Jan. 2 1967, since their affiliates were strongly opposed to give up the extra 15 minutes, especially as ABC's news was then a very-distant third place).

Apr. 30, 1964. Television sets manufactured as of this date are required to receive UHF channels.

Oct. 10, 1964. Live telecast on NBC-TV (via Syncom III) of the opening ceremonies of the 1964 Summer Olympics in Tokyo (airing on the U. S. East Coast from 1 to 3 A.M.); first live color TV program ever transmitted to the U. S. by satellite.

Mar. 24, 1965. Live TV pictures from unmanned U. S. moon probe Ranger 9 transmitted prior to impact in the crater Alphonsus.

May 1967. Premiere of the *Las Vegas Late Show* with Bill Dana, which was supposed to be the cornerstone of the United Network, an attempt to launch a fourth commercial TV network. In less than a month, both the show and the fourth network idea get canceled.

Oct. 14, 1968. First live network transmission of TV pictures from inside a manned U.S. space capsule in orbit: Apollo 7. There were six such broadcasts during their eleven-day mission.

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Broadcast History Timeline



SPECIAL OFFER!
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History has been marked by occasional dramatic jumps in technology. The majority of progress, however, has been made in incremental amounts -- one development leads to a second, and so on. With the technology base available today, the future of broadcasting will be exciting, indeed.

Major Industry Milestones

The Pioneers

- 1875 Thomson transmits wireless signals
 - 1876 Bell invents the telephone
 - 1884 Scanning disc for mechanical television invented by Paul Nipkow
 - 1886 Principle of magnetic recording discovered by Oberlin Smith
 - 1887 Hertz sends and receives radio waves
 - 1889 Film developed by Eastman and camera developed by Edison combined to produce the first motion picture system
 - 1895 Marconi develops radio transmitter and receiver
 - 1896 Kodak develops first motion picture film designed for projection
 - 1897 First cathode ray tube scanning device constructed by German scientist, Karl Ferdinand Braun
 - 1898 Poulson patents principles of magnetic recording
-

The Nineteen Hundreds

- 1900 Sarnoff emigrates to the U.S. from Russia at age 9
- Professor Reginald A. Fessenden transmits speech without wires
- 1901 Marconi receives first transatlantic radio signals
- 1904 Vacuum tube diode developed by Fleming
- 1905 Nipkow disc demonstrated
- Cathode-ray picture tube (CRT) demonstrated
- 1906 Vacuum tube triode developed by DeForest. First amplifier constructed
- 1907 Boris Rosing in Russia and A.A. Campbell-Swinton in England simultaneously develop image reproduction methods using electromagnetic scanning

1909 Herrold makes first successful radio broadcast at San Jose, CA

The Nineteen Tens

1910 First federal communication law, the Wireless Ship Act, enacted
1912 DeForest and Armstrong independently discover regeneration
 Sarnoff intercepts first distress message from the doomed ship Titanic
1913 Edison uses first diamond stylus in Amberola phonograph
1915 First practical radio telephone communications system constructed by Bell Labs
1917 9XM-WHA begins radio transmission from the University of Wisconsin at Madison
1918 Armstrong invents the superheterodyne receiver
1919 Hoxie develops a means of recording sound on motion picture film
 Radio Corporation of America founded

The Nineteen Twenties

1920 KDKA airs the world's first scheduled radio broadcast from Pittsburgh
 WWJ, Detroit, begins operation
1921 Aeriola Jr. designs the first affordable home radio
 Radio Central, Rocky Point, NY, opened by RCA
1922 Armstrong invents super-regeneration system
 WLW, Cincinnati, receives broadcast license
 Farnsworth investigates electronic picture transmission
1923 Zworykin patents the Iconoscope pickup tube for television: complete TV system including kinescope, or picture tube, demonstrated
 National Association of Broadcasters (NAB) formed
1924 Radio Manufacturers Association, predecessor of EIA, founded
1925 Rice and Kellogg develop first practical loudspeaker
 Baird (Great Britain) demonstrates first TV pictures via a mechanical system
1926 National Broadcasting Company founded
 Alexanderson develops scanning disc TV system
1927 Farnsworth transmits first electronic TV picture; applies for patent on electronic television
 Bell Telephone Laboratories demonstrates wireless TV between Whippany, NJ and New York
 Columbia Broadcasting System founded
 AC bias discovered for recording machines
1928 Federal Radio Commission established
 Pfeumer patents magnetic tape
 Image Dissector developed
 WGY-TV, Schenectady, NY, transmits 40-minute stage production using Alexanderson TV system
 Sound added to motion pictures; the "talkies" are born
 First experimental TV station permits issued by federal government
 First successful trial of video delivery through telephone lines; motion pictures sent from Chicago to New York by AT&T
1929 Zworkin demonstrates all-electronic TV system; Zworkin joins RCA

The Nineteen Thirties

- 1930 Farnsworth receives patent for Image Dissector pickup device
- RKO experiments with theater television in Schenectady, NY
- 1931 AEG engineers begin work on Magnetophone recorder
- CBS conducts experimental TV broadcasts
- Blattnerphone steel band recorder used by the BBC
- 1932 Langmuir conducts research on the physics of gaseous discharges, improving the vacuum tube
- NBC begins experimental telecasts
- Schroeter describes method for recording pictures on magnetic tape
- 1933 Armstrong demonstrates FM transmission to RCA
- NBC Red and Blue radio networks move into 30 Rockefeller Center studios
- First TV broadcast from an educational institution (W9XK, State University of Iowa)
- 1934 FCC established as a permanent regulatory agency
- AEG demonstrates Magnetophone at annual German Radio Fair
- WLW-AM begins super power operation at 500kW
- Mutual Broadcasting System founded
- Orthicon camera tube developed
- 1935 Armstrong begins 50kW experimental FM station at Alpine, NJ
- Iconoscope camera developed using improved pickup device
- RCA chief Sarnoff announces a \$1 million TV research program
- First TV broadcasts in Germany and England
- I. G. Farben (BASF) makes tape with iron oxide powder on a plastic film
- AEG-Telefunken produces the Magnetophone tape recorder
- 1937 CBS announces TV development program
- 1938 Marzocci files patent application for rotary head audio recorder
- 1939 GE demonstrates FM for mobile communications
- GE inaugurates FM broadcasting in Schenectady, NY
- WLW-AM loses its experimental license and is ordered to return to 50kW operation
- Volume Unit (VU) meter adopted as industry standard of program level measurement
- The principles of ac bias recording developed
- Image Iconoscope developed
- TV demonstrations held at World's Fair in New York and Golden Gate International Exhibition in San Francisco
- Roosevelt becomes first U.S. president to give a speech on television
- DuMont company begins producing television sets for consumers
- First baseball game ever televised, the Princeton/Columbia contest, covered by NBC at Baker Field, NY
- First television sets offered for sale in U.S. by RCA, GE, DuMont, Philco, and two other companies

The Nineteen Forties

- 1940 Paramount puts first TV station on the air in Chicago

- 1941 Magnetophone goes into regular service on German radio stations
FCC authorizes commercial TV stations
- 1942 Digital computer conceived
Sarnoff awarded the rank of Brigadier General
- 1943 Nobel buys NBC Blue Network and forms the American Broadcasting Company
Image Orthicon developed
- 1945 Orr and Mullin bring German magnetic tape technology back from Europe
FM broadcast band moved to 88-108MHz
Clarke suggests geosynchronous satellites for communications
- 1946 Mullin demonstrates German Magnetophone at San Francisco IRE meeting
DuMont Network founded
Zoomar introduces first professional zoom lens
Tokyo Tushin Kogyo founded; name changed to Sony in 1955
- 1947 First taped US radio network program airs, featuring Bing Crosby
3M introduces Scotch 100 audio tape
Transistor effect demonstrated at Bell Labs
First Hollywood film production for TV, *The Public Prosecutor*.
- 1948 ABC begins regular use of Ampex model 200 audio tape machine
- 1949 Liberty Broadcasting System founded
-

The Nineteen Fifties

- 1950 FCC approves CBS whirling disc color system
Rectangular kinescope developed
Vidicon developed
Installation of first CATV system begins
Tricolor kinescope developed
Mullin begins work on video recorder for Crosby Enterprises
Stereo tape recorder, Magnecord 1250, introduced
- 1952 FCC approves UHF-TV broadcasting
Ampex VTR team reproduces barely recognizable picture from tape
Crosby Enterprises demonstrates VTR with fixed heads and high tape speed
Axton (England) begins work on VERA video recorder project
Theater television reaches its peak with the broadcast of the Walcott/Marciano fight
- 1953 Wireless microphone demonstrated
AM transmitter remote control authorized by FCC
405-line color system developed by CBS with "crispening circuits" to improve apparent picture resolution
FCC reverses its decision to approve the CBS color system, deciding instead to authorize use of the color-compatible system developed by NTSC
Color TV broadcasting begins
RCA demonstrates its longitudinal video recorder
Toshiba begins work on helical scan video recorder
RCA develops shadow-mask color CRT

ABC merges with Paramount

1955 First FM picture off tape accomplished by Ampex VTR team

Experimental 1/2-inch videotape system is displayed in closed-circuit telecast from New York to St. Paul, MN

RCA prototype videotape machine used briefly on air at NBC

RCA demonstrates prototype single-tube color camera

Paramount Pictures develops forerunner of Sony Trinitron CRT

1956 First VTR demonstrated by Ampex at National Association of Radio and Television Broadcasters (hereafter referred to as NAB), using un-tested experimental 3M 2-inch videotape

Broadcast-quality solid-state camera (except for pickup tube) developed

Black-and-white portable TV era begins

Computer hard disk introduced

1957 Laser developed

2-inch quad VTR makes its network debut on CBS

RCA introduces the TRT-1A quad VTR

Radio-Electronics-Television Manufacturers Association changes name to Electronic Industries Association (EIA)

1958 Ampex demonstrates color VTR

1959 *Broadcast Engineering* magazine founded

National Stereophonic Radio Committee formed to decide on an FM stereo system

Audio cartridge recording system introduced at NAB by Collins Radio

Broadcast Electronics introduces Spotmaster cart machine

Ampex VTR at Moscow trade fair records the Nixon/Khrushchev "Kitchen Debate."

The Nineteen Sixties

1960 Stereo FM tests conducted over KDKA-FM, Pittsburgh

Ampex introduces Intersync system for VTR

Toshiba proposes a videotape recorder using a helical scanning process

Echo I and II passive reflector satellites launched

First rectangular screen TV introduced

First battery-operated transistorized TV for sale

1961 FM stereo transmission system approved by FCC

Electron beam recording demonstrated

Ampex SloMo Disc developed

First live televised presidential news conference (John Kennedy)

First Western viewing of live television from USSR on the BBC (Moscow welcome for Yuri Gagarin)

1962 FCC issues FM licensing reallocation rules

Philips introduces audio cassette tape player

Telstar communications satellite provides first international relay of TV pictures

Legislation passed in U.S. creating Comsat

Legislation passed requiring all-channel tuning (UHF and VHF) in television receivers

RCA announces first fully transistorized video recorder

1963 RCA develops metal oxide semiconductor (MOS) process

FCC releases new FM table of assignments

FCC releases new FM table of assignments
 TV transmitter remote control authorized by FCC
 ITFS service established by the FCC
 Electronic line-store (625-405 and 405-625) standards converter developed by the BBC
 TV used on a U.S. manned space flight, the Mercury 9
1964 RCA develops complementary MOS (CMOS) technology
 Society of Broadcast Engineers holds first official meeting at NAB in Chicago
 Intelsat organization formed
 Character generator system introduced
 RCA videotape cartridge developed
 First TV program automation system installed
 TV camera placed on board Ranger 7 explorer to moon
 TEAC provides slow-motion color video playback system for NHK coverage of 1964 Olympics
 Industry committee formed to establish videotape standards, with SMPTE as secretariat
1965 "Early Bird," first international communications satellite, launched (Intelsat I)
1966 First bipolar IC amplifier introduced
1967 PAL/SECAM standards announced
 First high-band color disc recorder for playback of short program segments in normal, slow or stop action is used on ABC-TV coverage of the *World Series of Skiing*
 First timecode editing system for video, called On-Time, is developed by CBS, Hollywood
 Solid state imaging technology demonstrated
 Intelsat II satellite launched
1968 CBS uses a portable minicam for political convention coverage
 Trinitron tube developed
 1-inch Plumbicon developed
 First radio/TV business automation systems installed
1969 Instant random-access audio cartridge machine introduced at NAB by IGM Communications
 SMPTE timecode established to end the chaos of incompatible time codes for various editing machines
 Neil Armstrong walks on the moon (July 21); worldwide audience watches the event live

The Nineteen Seventies

1970 PBS network established
Color-under recording used in first 3/4-inch VTR from Matsushita, Victor Company of Japan and Sony
 ACR-25 random access video cassette recorder introduced by Ampex
1971 U Format introduced by Sony/TEAC and JVC
 CMX formed after a joint experiment between CBS and Memorex
 NHK (Japan) begins experiments with high line number TV systems, and discusses the feasibility of an 1125-line system
 RCA joins EECO to develop and market the TCE-1000, an electronic editing system based on timecode
 Cinema Products CP-16 news film camera introduced
 Electronic tuning first seen in U.S. TVs
1972 Teletext experiments begin in United Kingdom
 Time base corrector introduced by Consolidated Video Systems

BBC develops "sound-in-sync" digital encoding system for audio-video combining

CMX 300, the first computerized editing system, is introduced for on-line editing and auto assemble of pre-edited shows

Adapted Sony camera and 3/4-inch U-matic VTR used for roving reports at the national political conventions

MCA gives first public demonstration of laser videodisk

First prerecorded videocassette tapes offered to consumers

1973 A Format 1-inch VTR shown by Ampex

First ENG cameras used in electronic field production

First multi-point distribution (MDS) microwave system launched

Giant-screen projection color TVs marketed

1974 First microprocessor used in broadcast equipment

2/3-inch Plumbicon developed

Frame reducer/recorder introduced

Sony introduces Betamax home VCR

1975 B Format 1-inch VTR shown by Bosch

Study group begins work on a digital video world standard

HBO begins program distribution via satellite

1976 Sony shows 1-inch VTR at NAB in Chicago

Ampex shows VPR-1 helical recorder with automatic scan tracking; also introduces a portable model, the VPR-10

World's first digital PAL TV transmission via satellite (Intelsat IV)

Ampex shows first electronic still store system, the ESS

VHS home recording format introduced

1977 PBS begins operation by satellite

TEAC introduces PCM digital audio disk recorder

Type C format VTRs introduced

Last tower of historic Radio Central, Rocky Point, NY, is destroyed

1978 Teletext experiments begin at KSL-TV in Salt Lake City

NHK experiments with HDTV via satellite relay

NHK begins multiple audio channel television in Tokyo

Fiber-optic technology demonstrated

Digital VTR demonstrated

1979 Mutual Radio Network and National Public Radio begin operation by satellite (analog)

B format and C format for VTRs accepted by SMPTE and ANSI

B format and C format portable VTRs with battery power shown

CCD telecine introduced by Bosch (FDL-60)

The Nineteen Eighties

1980 First of second generation type C machines introduced

1981 Beta Format introduced by Sony

M Format introduced (Matsushita, Panasonic, RCA and Ikegami)

First space shuttle launched

1/2-inch Plumbicon (Phillips) and Saticon (NHK) introduced
HDTV demonstrated in United States at SMPTE in Los Angeles
Digital video sampling frequency selected as 13.5MHz for worldwide use
ZDF, Rohde & Schwarz, and Siemens introduce multiple audio channel television in Berlin
TEAC develops optical laser write/read disc system
Ampex introduces ADO digital video processor
First camera/recorder ENG systems shown at NAB
Ampex and Dynamics Control show all-digital studio cameras
1982 FCC issues the "marketplace" decision on AM stereo
Low power TV service established by the FCC
First LPTV station begins operation in Bemidji, MN
Quantel Mirage introduced at NAB
NEC DVE effects system introduced at NAB
Bosch shows first 1/4-inch camera/recorder, the KBF-1 in prototype form
CMX/Orrox shows a disc-based editing system
Two HDTV systems are shown at IBC in Brighton (Sony and Philips). Two other systems are proposed for Germany and England using a doubled 625-line PAL signal
1983 Network radio distribution by satellite (ABC, CBS, NBC and RKO) using digital format
Digital TV receiver shown by ITT-Intermetall in Germany
Multiple audio channel TV system selected by EIA for U.S
Ku-Band satellite transmission for broadcast tested by NAB and during space shuttle launch
FCC issues 80-90 decision on FM radio
Use of FM subcarriers deregulated by FCC
First long-distance inter-city digital TV transmission sent via fiber optic cable
NEC introduces the SPC-3 CCD camera
1984 RCA introduces CCD-1 solid-state camera at NAB
Varian/EIMAC introduces Klystron tube as a product
FCC approves use of AM subcarriers for broadcast and non-broadcast functions
FCC eliminates programming guidelines, ascertainment, commercial rules and program logging requirements for commercial TV stations
FCC replaces the 7 station ownership rule with 12 station limits
Montage Picture Processor introduced by Montage Computer Systems
Lucasfilm/Convergence shows the Editdroid disk-based editing system designed to emulate film style editing
Multi-channel TV sound broadcast authorized by FCC; first stereo TV broadcasts begin. Sales of stereo color TV receivers and adapters begin
First color TVs with all-digital signal circuitry marketed
1985 FCC adopts RF radiation protection standards for human exposure
Panasonic introduces M-II format at NAB convention
Natuell introduces first totally solid state 50kW AM transmitter
U.S. Court of Appeals rules the FCC's "must-carry" rules regarding cable television are unconstitutional
FCC inquiry into "fairness doctrine" concludes the policy no longer serves the public interest
SMPTE working group on digital TV tape recording votes approval of the D-1 component digital format
The National Radio Systems Committee (NRSC) begins to study proposals for a standardized AM transmission pre-emphasis curve

Data transmission on vertical blanking interval authorized by FCC
Harris signs licensing agreement with rival Motorola on AM stereo transmission standard
CCIR approves D-1 digital component recording format for worldwide program exchange
Color TVs with 35-inch picture tubes marketed
1986 Sony introduces DVR-1000 digital videotape recorder based on CCIR 601 (D-1) standard
Ampex shows ACR-225 prototype composite digital cartridge VTR
Ampex, Thomson and Bosch sign manufacturing and marketing agreements with Sony to produce Betacam products
NBC announces purchase of M-II products from Panasonic
SMPTE forms ad hoc group on high definition studio systems to document specifications for 1125/60 HDTV
Ampex submits its composite digital format (D-2) to SMPTE for standardization
Scrambling of satellite-fed cable TV programming starts; sale of decoders and program subscriptions to home dish owners begins
Stereo-sound in television broadcasting available in all major U.S. population centers
1987 Super-channel DBS service begins in the U.K
Abekas introduces the A-64 digital disk CCIR 601 recorder
NEC introduces SR-10 solid state video recorder
Dolby introduces SR noise reduction system
Advanced Television Systems Committee announces plans to conduct over-the-air tests of HDTV transmission formats
FCC issues a Notice of Inquiry to determine the status of advanced TV systems
Enforcement of the "fairness doctrine" ends
SMPTE working group on HDTV approves 1125/60 standards document
NRSC announces voluntary standards to reduce AM band interference
NAB forms HDTV technology center to study future of television
Super VHS (S-VHS) introduced
1988 FCC refuses to reconsider marketplace decision on AM stereo
NRSC issues second voluntary national standard (NRSC-2) for AM radio
Ampex and Sony introduce D-2 digital composite tape machines
Harris introduces DX-25 digital solid state AM transmitter
First Klystron-equipped 60kW UHF transmitter goes on the air in Wrens, GA
FCC rules that advanced television systems designed to deliver improved pictures to consumers must be compatible with existing NTSC receivers
Europe's Eureka 95 HDTV system demonstrated at IBC in Brighton, England
NBC proposes a 1050/59.94 HDTV system with the backing of ABC, Zenith, Thomson Consumer Electronics, North American Philips and others
Philips laboratories demonstrates its HDTV system designed for satellite transmission (HDS-NA)
Advanced Television Test Center announces plans to begin over-the-air tests of proposed advanced and high definition TV systems
First improved definition television (IDTV) receivers marketed
1989 American National Standards Institute (ANSI) gives final approval to 1125/60 HDTV production standard
Varian/TVT announces plans to install multi-stage depressed collector (MSDC) klystron transmitter

The Nineties

1990 Production of giant-screen (over 27-inch) color TV picture tubes starts in U.S

Legislation requiring close captioning decoders in all larger color TVs manufactured after July 1, 1993 signed into law

All-digital high-definition television (HDTV) system proposed; FCC sets testing schedule

1991 First TVs with built-in closed-caption display capability introduced in U.S

U.S. testing of HDTV systems begins

1993 16:9 aspect ratio (widescreen) television sets marketed in U.S.

1995 First television program (*Computer Chronicles*) delivered via the Internet

First television station (KOLD 13) uses a networked digital video server in its daily on-air operations

Interactive cable modem trials with consumers started

Flat-screen plasma display TVs introduced

1996 First TV sets equipped with VCR Plus+ introduced in U.S

HDTV is broadcast and received live at test station WHD-TV in Washington, D.C

Set-top boxes plug into TV and telephone and allow viewers to surf the Internet's World Wide Web via remote control

Zenith introduces the U.S. market's first HDTV-compatible front projection TV

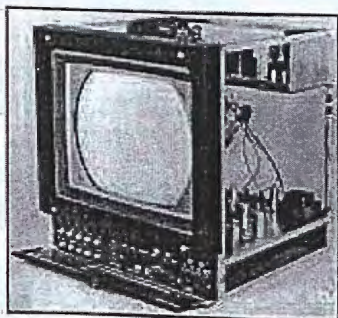
Agreement between broadcasters, TV manufacturers, and PC makers sets inter-industry standard for digital HDTV

1997 FCC assigns digital spectrum to broadcasters and sets schedule for digital broadcasts

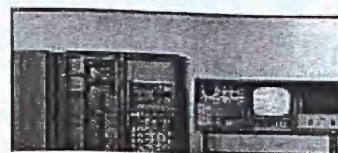
Historical Photos



Studio source and control equipment has changed dramatically within the last 30 years. Audio control boards and video switchers have become more compact, versatile and user-friendly. Shown is a 1959 model Gates Radio Gatesway audio board. (Courtesy of Harris.)



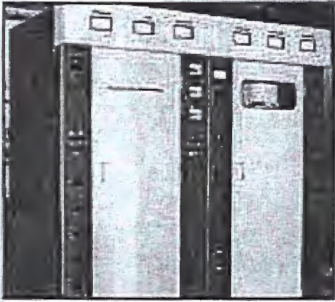
Video monitoring equipment has undergone immense changes during the past 50 years. The large (and heavy) picture monitors of the late '50s and early '60s used vacuum tubes by the dozen. Today's monitors are smaller, easier to use, more stable and offer more features than engineers could have imagined in the early days of television. Solid-state and digital technologies have made these advances possible. Shown is a Conrac CF-21 color monitor available in 1959. (Courtesy of Conrac.)



It is hard to overestimate the effect that videotape recording technology has had on the broadcast industry. By 1959, Ampex and RCA were producing the fruits of their 1957-58 technology exchange -- RCA's color knowledge for



Ampex's spinning head and FM signal processing technology. Ampex introduced *Intersync* with the VR-1000B in 1959 and the *10-10 color kit*. VTRs of today offer features and flexibility thought impossible only a few years ago. (Courtesy of Ampex.)



Dramatic improvements have been made over the years in AM transmitter efficiency. New technology transmitters run cooler, quieter and often can switch around a problem stage on their own. Shown is a 1960s vintage Continental 10kW AM transmitter, which used 6 vacuum tubes. (Courtesy of Continental.)

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TV Broadcasting History - Various Articles

Picture Transmission and Television (1928)

This is taken from the article "Radio Telegraphy and Telephony" in the 1929 World Almanac. The article was prepared by the information department of the American Telephone and Telegraph Company.

Since signals for the transmission of pictures or of television may be sent by either radio or wire, these matters are not restricted to the radio field. In this account of the development of the radio art, it therefore seems appropriate to describe chiefly those systems which have been demonstrated or are now in use, employing radio channels.

The "Photoradio" process used by the Radio Corporation of America for the facsimile transmission of material employs at the transmitting station a scanning process which effectively transforms the picture from a half-tone into a black and white dotted picture. In this way signals are transmitted at frequent intervals instead of continuously and the effects of the variable ether path are partly obviated. At the receiving end, chemically treated paper is darkened by the action of a jet of hot air under the control of the incoming signals. This process requires about one hour for the transmission of a picture and during 1928 continued in operation across the Atlantic between New York and London, and across the Pacific between San Francisco and Honolulu.

The transmission of weather maps by the U. S. Navy has continued using the apparatus developed by C. Francis Jenkins. This is a system by which weather maps are sent from Washington to some of the ships of the Navy at considerable distances.

The broadcasting of pictures by a few regular radio broadcasting stations, using frequencies in the broadcast band, has continued during the year 1928. Considerable interest in the reception of these pictures has been manifested by technically-minded listeners.

The most striking development in electrical communication within the last two years has undoubtedly been television. This was accomplished both by wire and by radio at the initial demonstration by the Bell System on April 7, 1927. The radio demonstration at that time consisted of the transmission of television signals from Whippany, N. J., 22 miles from New York, to the Bell Laboratories building in New York City where the speakers and performers were readily recognized on the receiving screen. The voices of the persons at Whippany were transmitted, and reproduced by means of a loud speaker.

At two demonstrations during 1928 the Bell Laboratories showed improvements in the television apparatus, the first consisting of the use of crystals for controlling the frequency of the transmitting and receiving apparatus, thus eliminating the necessity for the transmission of synchronizing current. The second demonstration was of the transmission of a scene in the open air, illuminated by ordinary sunlight.

The General Electric Company has also been active in this field and has demonstrated television upon a screen such as one would use for a home motion picture projector. Other parties, notably C. Francis Jenkins of Washington, have been active in television or the related field of picture transmission.

Various workers in Europe have also been engaged in the study of optical transmissions by

electricity. Baird in England has used both visible and infra-red light and is also reported to have demonstrated the reproduction of television images in color. In Germany, Karolus has perfected a cell through which light passes in variable amounts under the control of an electric field. This furnishes a rapid method of varying an intense beam of light. In France, Belin has also conducted investigations on optical transmissions, using the cathode ray oscillograph.

On account of the great popular interest in television, it should be explained that the apparatus required is rather elaborate and that even under laboratory conditions the art has not yet come to near the stage of development required to reproduce scenes with the fineness of detail of the regular motion picture.

New York Times, Sept. 23, 1945

Television station WABD discontinued its programs after its sign-off last Thursday night and will not be back on the air until Dec. 15. In the interval the station will shift from channel 4 (78 to 84 megacycles) to its newly assigned channel 5 (76 to 82 megacycles), a position in the spectrum not heretofore assigned to the New York area.

During the interim period between telecasts, DuMont engineers are making arrangements to assist set owners in modifying their receivers to receive programs on the new band.

Rules and Regulations Governing Visual Broadcasting

Feb. 18, 1929

The Federal Radio Commission has adopted the following rules and regulations governing visual broadcasting:

That visual broadcasting be designated to include both television broadcasting and picture broadcasting, or moving-picture broadcasting and still-picture broadcasting, and that all licenses issued to be of an experimental nature for a period of six months only, the licensees to report to the commission the results of their experiments; the transmitters to be located outside the city limits and sufficiently distant from important receiving centers to avoid interference.

For joint use to visual broadcasting licensees the commission authorizes the following bands of frequencies for experimental use only; 2,000 to 2,200 and 2,750 to 2,950 kilocycles. In addition, the commission will authorize the operation of visual radio broadcasting transmitters in the band between 2,200 and 2,300 kilocycles, on the condition that they do not interfere in any way whatever with the services of any other nation on the North American Continent and in the West Indies, and that licenses be subject to revocation in case there are any complaints from any other nations of any such interference. The commission may continue to issue experimental television or visual licenses in the broadcast band for operation between 1 and 6 a.m. only, in accordance with General Order 50.

The commission adopted the following rules of priority in the granting of applications:

1. Those engaged in experimentation to improve the technique of visual broadcasting.
2. Those who employ methods which give the maximum definition with the minimum radio frequency band widths.

Book Excerpt

The following is excerpted from The Radio Manual (for Radio Engineers, Inspectors, Students, Operators and Radio Fans), Second Edition, September, 1929, by George E. Sterling (Radio Inspector, Radio Division, U. S. Department of Commerce), published by D. Van Nostrand Company, New York.

2. Early Developments -- In June, 1925, Mr. C. Francis Jenkins gave the first public demonstration or the transmission of images of living subjects, and also of film records of persons and scenes. Mr. Jenkins effected his transmission by radio and in the latter case called his images of living subjects "radio vision," and his transmission of films "radio movies." In April, 1927, the American Telephone and Telegraph Company transmitted images of living persons from Washington to New York over telephone circuits. The same sort of images were also transmitted by radio from the A. T. & T. experimental station at Whippany, N. J. to the laboratories in New York City. In the considerable publicity given to the A. T. & T. transmissions the term "television" was used, and has largely been adopted by the general public as applying to any form of visual broadcasting. One cannot well quarrel with established usage, even though incorrect, but a discrimination should be made between the radio transmission of living subjects and transmission of film records of such subjects. Therefore in this chapter we will call the first system "television" (meaning radio vision, although the term does not say so) and the second one "radio movies."

Now observe that in the A. T. & T. demonstrations wire and radio channels were used interchangeably. Thus the art of seeing at a distance is not necessarily a radio art and the reason for introducing it into a radio book lies in the expectation that some form of it will see wide distribution as an auxiliary to the present (acoustic) radio broadcasting. Independent wire development for public entertainment can be expected.

3.) Radiomovies -- Radiomovies are made possible by first photographing the subject with an ordinary motion picture camera. The problem then becomes that of transforming the lights and shadows of this film into electrical impulses which can be transmitted and at the receiving end reconverted into lights and shadows properly distributed on the receiving screen. Since in the ordinary moving picture theatre a flickerless picture necessitates running the film through the projector at the rate of about 16 pictures per second, we must carry out our process of conversion at this same rate, which is to say, we must in 1/16 of 1 second completely transform one "frame" or picture into electrical impulses and move it on so that the next "frame" may be similarly analysed in the next 1/16 of 1 second. The process of doing this is basically the same one of "scanning line-for-line" as is used in transmitting directly the image of a living person. However, the small size of the film permits some surprising simplifications and economies of the apparatus and without doubt the greatest accomplishments have been made along the line of transmitting and receiving silhouette and half-tone radiomovies. As transmitted from the Jenkins station W3XX, these have been well received over a considerable portion of the United States.

The first radiomovies transmitted from the Jenkins Laboratories were only silhouettes in order to confine the frequency...

29. Rules and Regulations of the Federal Radio Commission governing the Operation of Visual Broadcasting -- That visual broadcasting be designated to include both television broadcasting and picture broadcasting, or moving picture broadcasting and still picture broadcasting, and that all licenses issued be of an experimental for a period of six months only, the licensees to report to the Commission the results of their experiments; the transmitters to be located outside of the city limits and sufficiently distant from local programming centers to avoid interference.

For joint use to visual broadcasting licensees, the Commission authorized the following bands of frequencies for experimental use only: 2000 to 2200 and 2750 to 2950 kilocycles, on the condition that they do not interfere in any way whatever with the services of any other nation on the North American Continent or in the West Indies, and that licenses be subject to revocation in case there are any complaints from any other nation of any such interference. The Commission may continue to issue experimental television or visual licenses in the broadcast band for operation between 1 and 6 a. m. only, in accordance with Central Order 50.

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2. Those who employ methods which give the maximum definition with the minimum radio frequency bandwidths.

LIST OF VISUAL BROADCASTING (TELEVISION) STATIONS

CALL	LOCATION	LICENSEE	FREQUENCY	POWER
W1XAE	624 Page Blvd., E. Springfield, MA	Westinghouse Elect. & Mfg.	2.0 - 2.1	20.0
W1XAY	Adams Street, Lexington, MA	J. Smith Dodge	4.8 - 4.9	0.5
W1XB	63 Gorham Street, Somerville, MA	General Industries	2.1 - 2.2, 2.75 - 2.85	0.5
W2XBA	Newark, NJ	WAAM, Inc.	2.75 - 2.85	0.05
W2XBS	70 van Cortland Pk. S., New York, NY (portable)	Radio Corporation of America	2.0 - 2.1	5.0
W2XBU	Beacon, NY	Harold E. Smith	4.8 - 4.9	0.1
W2XBV	New York, NY (portable)	Radio Corporation of America	2.0 - 2.1	5.0
W2XBW	Initial location: 70 River Road, Bound Brook, NJ (portable)	Radio Corporation of America	2.0 - 2.1	5.0
W2XCL	323 Berry Street, Brooklyn, NY	Pilot Electric Mfg. Co.	2.0 - 2.1, 2.75 - 2.85	0.25
W2XCO	New York, NY (near)	Radio Corporation of America	2.1 - 2.2	5.0
W2XCR	346-70 Claremont St., Jersey City, NJ	Jenkins Television Corp.	2.1 - 2.2	5.0
W2XCW	1 River Road, Schenectady, NY	General Electric Company	2.1 - 2.2	20.0
W2XR	140 Nassau Street, New York, NY	John V. L. Hogan	2.0 - 2.1, 2.1 - 2.2	0.5
W2XX	Overton Road, Ossining, NY	Robert F. Gowen	2.0 - 2.1	0.1
W3XK	1519 Connecticut Ave., Washington, DC	Jenkins Laboratories	2.0 - 2.1, 2.85 - 2.95	5.0

W3XL	River Road, Bound Brook, NJ	RCA Communications	2.85 - 2.95	30.0
W4XE	Winter Park, FL	William J. Lee	2.0 - 2.1	2.0
W6XAM	Washington & Oak Sts., Los Angeles, CA	Ben S. McGlashan	2.0 - 2.1	0.5
W6XC	5155 S. Grammercy Place, Los Angeles, CA	Robert B. Parrish	4.5 - 4.6	15.0
W7XAO	Portland, OR	Wilbur Jerman	2.75 - 2.85	0.1
W8XAV	E. Pittsburgh, PA	Westinghouse Elect. & Mfg.	2.0 - 2.1, 2.1 - 2.2, 2.75 - 2.85	20.0
W9XAA	Foot of Grand Avenue, Chicago, IL	Chicago Federation of Labor	2.0 - 2.1	1.0
W9XAG	1768 Wilson Avenue, Chicago, IL	Aero Products, Inc.	2.0 - 2.1	1.0
W9XAO	6312 Broadway, Chicago, IL	Nelson Bros. Bond & Mortgage	2.0 - 2.1	0.5
W9XAZ	Iowa City, IA	University of Iowa	2.0 - 2.1	0.5
WRNY	Hudson Terrace, Coytesville, NJ (1 to 6 am only)	Aviation Radio Station, Inc.	1010 kc.	0.25

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1935-1960

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1935-1941 Timeline

1935

- Patent interference between Zworykin and Farnsworth ruled in favor of Farnsworth. Prevents RCA from gaining total patent control of television.
- Sarnoff evicts Armstrong from the Empire State building and announces million dollar research and testing plans for television.
- March - Germany begins what they call the "first television broadcasting service in the world". Low resolution, few receivers.

1936

- April - First RCA demonstration in 4 years of all-electronic system, 343 lines, 30 frames per second.
- Farnsworth also broadcasting 343-30 at Wyndmoor, Pennsylvania station.
- Summer -- Berlin Olympics televised by Telefunken and Fernseh, using RCA and Farnsworth equipment, respectively.
- Fall -- Farnsworths travel to England to help Baird in his competition with EMI.

■ November 2 -- BBC begins two-year Baird-EMI competition, broadcasting from Alexandra Palace. It is hailed as the "world's first, *public*, regular, high-definition TV station".

■ November 30 -- Fire destroys Baird labs at Crystal Palace

1937

■ February -- BBC declares EMI the victor in competition.

■ The coronation of King George VI and the Wimbledon tennis tournament are televised in England. Nine thousand sets are sold in London.

■ France orders the world's most powerful transmitter to be constructed in the Eiffel Tower.

■ 18 Experimental Television Stations are operating in the United States.

1938

■ June -- RCA announces the *Image* Iconoscope, a camera tube that is almost ten times more sensitive to light than the earlier Iconoscope.

■ October -- Sarnoff announces that RCA will begin regular broadcasting at the World's Fair

1939

■ March 31 -- Farnsworth begins operations at Fort Wayne, Indiana

■ April 20 -- Sarnoff announces from the New York World's Fair that "Now we have added sight to

sound". Ten days later, at the opening ceremonies, FDR is the first president to be televised, TV sets go on sale the following day. [Click here for a listing of television stations operating in the United States.](#)

- Approximately twenty-thousand electronic sets operating in England.

- 1 September 1939 -- UK-television transmissions switched off due to imminent outbreak of war.

- October 2 -- Farnsworth signs patent-licensing agreement with RCA. This is the first time that RCA has ever agreed to pay royalties to another company, since it is founded in 1919.

1940

- FCC announced September 1st start date for commercial television, but canceled that decision when RCA began advertising early.
- FCC formed a special committee, called the NTSC (National Television Standards Committee), to decide on industry standards. There were 23 experimental television broadcasting stations operating in the United States.
- JUNE: Both RCA and Philco televised the Republican convention, held in Philadelphia
- AUGUST: A young (33) Peter Goldmark announced to the NTSC that CBS had marketable color television.

1941

- MARCH: The NTSC announced the recommended USA standard of 525 lines and 30 fps (frames per second). FCC announced that commercial broadcasting could begin July 1st.
- JULY 1st: NBC was the first with commercially sponsored broadcasts -- then, CBS, DuMont and others followed in the Fall
- DECEMBER 7th: Pearl Harbor

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1950-1959 Timeline

This page is a timeline of important dates and events that occurred in the 1950-1959 time period.

1950

- CBS presents color television system using a spinning mechanical color wheel. In October, the FCC approves CBS color for commercial broadcasting. Samoff orders his "holy crusade" at RCA to perfect electronic color television. Click [here](#) for the company booklet issued in December 1950, telling about the success of their intense efforts.

1951

- June 25th: CBS broadcasts a one-hour Ed Sullivan show, but only two dozen CBS sets can receive the color broadcast. By the end of June, RCA demonstrates its electronic color system, and the industry takes notice.
- October: All color TV production is suspended for the duration of the Korean conflict.
- December 6th: Code of Practices for Television Broadcasters is adopted for USA. Also known as the "Seal of Good Practice".

1953

- March 25th: CBS gives victory to RCA in color war.
- December 17th: FCC approves electronic RCA color system, reversing its prior decision to accept CBS mechanical system. It calls this new RCA color system "NTSC" color.

1954

- RCA places its first all-electronic color set on the market, early in the year, the CTC-100, with a 12-1/2" screen, for \$1,000. Sales were predicted to be 75,000 units -- however, only a **reported** 5,000 were sold. Current belief is that the real number is closer to 1,000 sets sold to the public. Many sets were donated to schools and also sold at a discount to employees.

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- Time* magazine calls color TV "the most resounding industrial flop of 1956"
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1946-1949 Timeline

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1946

- CBS gave the FCC a demonstration of their mechanical color system. Viewers were impressed.
- J. Logie Baird, Scottish television pioneer, dies.
- Post war production of American TV sets begins



1946 7" Viewtone - Truly the first post war American television (utilizing a pre-war design), marketed as a 1946 model, but sold in very small quantities starting in August 1945. The selling price was \$100, quite an affordable set at the time. The president of Viewtone, Mr. Irving Kane, wanted to tap into the post war television market as quickly as possible, and also wanted to offer a set that people could afford. The photograph at the left was taken in August 1945. Eventually four different models were sold, all using Du Mont picture tubes. The company went out of business in August 1947. There are no known examples of the set shown in the photograph.



1946 7" RCA 621TS - RCA *announced* both the 621TS (and the 630TS below) to the American public on October 7th 1946. RCA then had a five city (newspaper) advertising campaign for both sets, with sales beginning in November 1946.

The cabinet of the 621TS (offered in mahogany, walnut and blonde wood) was designed in the pre-war period by John Vassos, however the chassis was a post-war design. Initial price was \$226.40. The 621 was on the market very briefly and was quickly outsold by the 630TS with a 10" screen (see below). Production was 17,000 units - not many have survived until today - the set is popular among collectors.



1946 10" RCA Model 630TS - Initial selling price was \$352.00. It weighed 95 lbs., and was on the market from 1946 until 1949. Many other manufacturers bought the 630 chassis, and had their own cabinets made. Even in 1950, the set was offered in kit form and a hobbyist could build a do-it-yourself TV set. Approximately 43,000 were sold the first year and hundreds-of-thousands continued to be sold in later

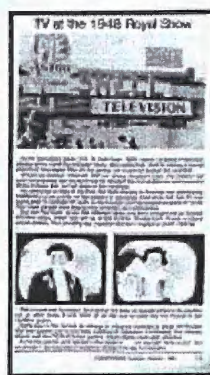
years. Collectors call this the Model-T of television, and it is the first set completely designed and marketed post war.

1947

- RCA flooded the market with black & white sets to slow the potential launch of CBS color. An adapter (about \$100) would have to be installed to all non-CBS color sets. The FCC ruled CBS color is 'premature'.

1948

- Pye Television, a UK firm, set up a demonstration at the Australian "Royal Easter Show", held in Sydney, six years ahead of the first public broadcasts. Read the full story below:



(144K)

1949

- Facing the challenge head-on, Sarnoff ordered stepped-up development of an all-electronic RCA color system. Perfected system is ready by December 1950.
- Farnsworth Radio and Television is sold to ITT. Philo Farnsworth, at age 43, suffering from alcoholism, was no longer a part of the television industry.

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1942-1945 Timeline

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1942-1945

- All commercial production of television equipment is banned for the rest of the war. NBC's commercial TV schedule is cancelled. Limited broadcasting does continue, however, throughout the war years, in a few cities, for a few hours per week.


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-

This is the CBS section of The Broadcast Archive

Maintained by:
Barry Mishkind - The Eclectic Engineer
Last Updated 2/14/03

CBS history started on January 27, 1927, as United Independent Broadcasters, Inc.

Even before United got started, the Columbia Phonograph Co. had become interested in the venture. **The Columbia Phonograph Broadcasting System**, which was to act as sales agent for United, was organized in April of 1927. United contracted to pay each of the original 16 stations \$500 per week for 10 hours of radio time. Soon the Sales agent could not sell enough air time and the network was near collapse after only a few months.

The Columbia phonograph company then withdrew from the project with the sale of all capital stock which United bought and then renamed the company the **Columbia Broadcasting System**. William S. Paley and his family then bought the majority of CBS stock and the network began to grow. In 199x CBS was sold to Westinghouse.

Sunday, September 18, 1927: CBS made its first network broadcast at 3 PM EST.

- 16 stations were on board for Opening Day.
- Originating station: WOR Newark (the first control room was in the men's room)
- Other Stations:
 - WEAN Providence
 - WNAC Boston
 - WFBL Syracuse
 - WMAK Buffalo-Lockport
 - WCAU Philadelphia
 - WJAS Pittsburgh
 - WADC Akron
 - WAIU Columbia
 - WKRC Cincinnati
 - WGHP Detroit
 - WMAQ Chicago
 - KMOX St. Louis
 - WCAO Baltimore
 - KOIL Council Bluffs
 - WOWO Fort Wayne

12/15/28: WABC New York (O&O) replaces WOR.

CBS featured its own 22 piece symphony orchestra, led by conductor Howard Barlow. Master of Ceremonies on opening day was Major J. Andrew White, who also served as Vice President of the new chain. The Opening Day programming featured a performance of "The King's Henchman", performed by a cast of performers from the Metropolitan Opera. Other programs featured classical selections by members of the New York Philharmonic, and the Philadelphia Symphony Orchestra, among others.

Columbia was known as the "**Purple Network**" (from the color coding on the AT&T diagrams).

Among the first networks to truly realize the power of news and to develop its use, **CBS News through WWII** is Frank Absher's look at the rise of network news.

Other interesting events in the CBS timeline:

January 1941, CBS started a Latin American net of 39 longwave and 25 shortwave stations in 18 countries.

1946: Flagship AM station in New York City changes calls to WCBS.

1975(?): along with the other networks, CBS sought the youth market with RadioRadio. These newscasts ran at :50.

November 1995: Acquired by Westinghouse.

June 1996: CBS Radio was made part of newly acquired Infinity Broadcasting, and then "spun off" as a CBS subsidiary.

December 1997: Westinghouse is officially renamed CBS Corporation.

2000: Acquired by Viacom.

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It would be a kindness if you'd take a moment and let me know who you are and what interests you have. If you can share some information, or even a picture, that would be great! Just click on the address below. Thanks.

An important note about this resource:

We have used many sources, including FCC files, university lecturers, historical publications and more, and have tried to be as accurate as possible, not repeating many of the myths of the industry (such as the Uncle Don Story) nor histories "manufactured" by promotion departments. However, I can not and do not guarantee total accuracy of what is in the FAQ. If you do see an error or omission, please inform me at: [this email address](#). (be sure to fix the anti-spam part)

The accuracy and expansion of this resource depend upon our SHARING our efforts.

- If you can help, please share your materials or information.
- email barry (be sure to fix the anti-spam part)
- snailmail:

Barry Mishkind
2033 S. Augusta Place
Tucson, Arizona 85710
(520) 296-3797

- *Thanks a megaWatt!*

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NATIONAL BROADCASTING COMPANY

U.S. NETWORK

The fortunes of the National Broadcasting Company (NBC) have always been closely tied to those of its parent company, Radio Corporation of America (RCA). Unlike CBS, which was formed as an independent programming enterprise, NBC came into existence as the subsidiary of an electronics manufacturer which saw programming as a form of marketing, an enticement to purchase radio and television receivers for the home. The power and influence of a national network aided RCA as it lobbied to see its technology adopted as the industry standard, particularly during the early years of television and in the battle over color television.

RCA was formed after World War I when General Electric signed an extensive patents cross-licensing agreement with Westinghouse, AT and T, and United Fruit. The product of this alliance, RCA was owned jointly by the four companies and was created for the purpose of marketing radio receivers produced by G. E. and Westinghouse. As the alliance unraveled during the late 1920s and early 1930s, due to internal competition and government antitrust efforts, RCA emerged as an independent company. In November 1926, RCA formed NBC as a wholly-owned subsidiary. Shortly thereafter, RCA added a second network, and the two networks were designated NBC-Red and NBC-Blue.

RCA, which had been merely a sales agent for the other companies emerged in the 1930s as a radio manufacturer with two networks, a powerful lineup of clear channel stations, and a roster of stars who were unequaled in the radio industry. From this position of power RCA research labs under the direction of Vladimir Zworykin set the standard for research into the nascent technology of television. NBC began experimental broadcasts from New York's Empire State building as early as 1932. By 1935 the company was spending millions of dollars annually to fund television research. Profits from the lucrative NBC radio networks were routinely channeled into television research. In 1939 NBC became the first network to introduce regular television broadcasts with its inaugural telecast of the opening day ceremonies at the New York World's Fair of 1939. RCA's goal was to produce and market receivers and programs, to become the driving force in the emerging industry.

RCA's dominance of the broadcast industry led to government scrutiny in the late 1930s when the FCC began to investigate the legitimacy of networks, or "chain broadcasting" as it was then called. The result was the 1941 publication of the FCC's Report on Chain Broadcasting which criticized the network's control of a majority of high-powered stations and called for the divorcement of NBC's two networks. RCA took the decision to court, but failed to overturn the FCC's findings. In 1943 RCA sold its Blue network to Edward J. Noble, and this network eventually became ABC.

After World War II, RCA moved quickly to consolidate its influence over the television industry. While CBS tried to stall efforts to establish technological standards in order to promote its own color-TV technology, RCA pushed hard for the development of television according to the existing NTSC

Programming under Kintner followed the network's traditional reliance on dramas and comedy-variety. NBC formed a strategic alliance with the production company MCA-Universal, whose drama series came to dominate the network's schedule well into the 1970s. After introducing movies to prime-time with *Saturday Night at the Movies* in 1961, NBC joined with MCA-Universal to develop several long-form program formats, including the ninety-minute episodic series (*The Virginian*), the made-for-TV movie (debuting with *Fame Is The Name of the Game* in 1966), and the movie series (*The NBC Mystery Movie*, which initially featured *Columbo*, *McCloud*, and *McMillan and Wife*).

During the late 1970s, after decades of battling CBS in the ratings, NBC watched as ABC, with a sitcom-laden schedule, took command of the ratings race, leaving NBC in a distant third place. To halt its steep decline, NBC recruited Fred Silverman, the man who had engineered ABC's rapid rise. Silverman's tenure as president of NBC lasted from 1978 to 1981 and is probably the lowest point in the history of the network. Instead of turning around NBC's fortunes, Silverman presided over an era of steadily declining viewers, affiliate desertions, and programs that were often mediocre (*BJ and the Bear*) and occasionally disastrous (*Supertrain*).

At the depths of its fortunes in 1981, mired in third place, NBC recruited Grant Tinker to become NBC chairman. A cofounder of MTM Enterprises, Tinker had presided over the spectacular rise of the independent production company that had produced *The Mary Tyler Moore Show*, *Lou Grant*, and *Hill Street Blues*. Tinker led NBC on a three-year journey back to respectability by continuing the commitment to quality programming that had marked his tenure at MTM. Along with his chief programmer, Brandon Tartikoff, Tinker patiently nurtured such acclaimed series as *Hill Street Blues*, *Cheers*, *St. Elsewhere*, and *Family Ties*. The turning point for NBC came in 1984 when Tartikoff convinced comedian Bill Cosby to return to series television with *The Cosby Show*. Network profits under Tinker climbed from \$48 million in his first year to \$333 million in 1985.

By the mid-1980s NBC generated 43% of RCA's \$570 million in earnings—a hugely disproportionate share of the profits of the single division of the conglomerate. In the merger mania of the 1980s, RCA became a ripe target for takeover, particularly given the potential value of the company when broken into various components. General Electric purchased RCA—along with NBC—in 1985 for \$6.3 billion. When Tinker stepped down in 1986, G.E. chairman John F. Welch, Jr. named former G.E. executive Robert E. Wright as network chairman. Based on the continued success of the series left behind by Tinker, NBC dominated the ratings until the late 1980s—when its ratings and profits suddenly collapsed, leaving losses of \$100 million in 1991 and just one show, *Cheers*, in the Nielsen Top 10.

Rumors warned that G.E. was about to bail out, selling NBC to Paramount, Time Warner, Disney, or perhaps even a syndicate headed by Bill Cosby. G.E. management came

technical standards established in 1941. The FCC agreed with RCA, though the two networks continued to battle over standards for color television until the RCA system was finally selected in 1953. Throughout this period, network television played a secondary role at RCA. In the early 1950s NBC accounted for only one-quarter of RCA's corporate profits. NBC's most important role for its parent was in helping to extend the general appeal of television as the market for television sets boomed.

Throughout the 1950s and 1960s, NBC generally finished in second place in the ratings behind CBS. NBC's prime-time schedule relied heavily on two genres: drama, including several of the most acclaimed anthology drama series of the 1950s (*Philco/Goodyear Playhouse*, *Kraft Television Theater*), and comedy-variety, featuring such stars as Milton Berle, Jimmy Durante, Sid Caesar and Imogene Coca, Dean Martin and Jerry Lewis, Bob Hope, and Perry Como. In spite of its dependence on these familiar genres, NBC was also responsible for several programming innovations.

Several key innovations are credited to Sylvester "Pat" Weaver, who served as the network's chief programmer from 1949 to 1953 and as president from 1953 to 1955. Weaver is credited with introducing the "magazine concept" of television advertising, in which advertisers no longer sponsored an entire series, but paid to have their ads placed within a program—as ads appear in a magazine. Previously, networks had functioned as conduits for sponsor-produced programming; this move shifted the balance of power toward the networks, which were able to exert more control over programming. Weaver expanded the network schedule into the "fringe" time periods of early morning and late night by introducing *Today* and *Tonight*. He also championed "event" programming that broke the routines of regularly-scheduled series with expensive, one-shot broadcasts, which he called "spectaculars." Broadcast live, the Broadway production of *Peter Pan* drew a record audience of 65 million viewers.

Former ABC president Robert Kintner took over programming at NBC in 1956 and served as network president from 1958 to 1965. Kintner supervised the expansion of NBC news, the shift to color broadcasting (completed in 1965), and the network's diversification beyond television programming. Through RCA, NBC branched out during the 1960s, acquiring financial interest in Hertz rental cars, a carpet manufacturer, and real-estate holdings. The network moved aggressively into international markets, selling programs overseas through its NBC International subsidiary, which placed NBC programs in more than eighty countries. By the mid-1960s NBC had invested in thirteen television stations and one network in eight countries.

under intense criticism for its sometimes harsh cost-cutting which many felt had damaged network operations, particularly in the news division. G.E. was also blamed for misunderstanding the business of broadcasting. The network suffered a series of public relations debacles, including a fraudulent news report on the newsmagazine *Dateline* and bungled attempts to name a successor to Johnny Carson, host of the flagship *Tonight Show*.

But General Electric held onto NBC, and Robert Wright remained in charge. By 1996 NBC is once again the undisputed leader of network television with the five top-rated shows most weeks. Under the programming of Warren Littlefield, NBC has solid hits in *Seinfeld*, *E.R.*, *Frasier*, and *Friends*. G.E. has also spent a considerable amount of its money to guarantee NBC the rights to the most valuable televised sports events, including \$4 billion for the rights to broadcast the Olympics until well into the twenty-first century. In addition, NBC has diversified substantially during the G.E. era. The network owns minor stakes in cable channels such as Arts and Entertainment, Court TV, American Movie Classics, Bravo, Sports Channel America, and the History Channel. NBC founded a cable network, CNBC, a business news channel which is valued at more than \$1 billion. From this success it has spun off the cable network America's Talking, which will be converted to an all-news channel through an alliance formed with computer software giant Microsoft. And the network has invested \$23 million in a Europe-based cable and satellite network called Super Channel, which will extend NBC's global reach.

-Christopher Ande

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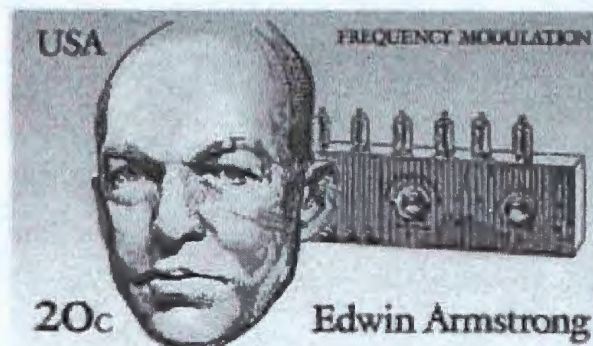
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See also American Broadcasting Company; Columbia Broadcasting System; Sarnoff, David; Sarnoff, Robert; Kir Robert; Wright, Robert

FM Broadcasting Chronology



A 1983 U. S. postage stamp depicting Edwin H. Armstrong, the inventor of frequency modulation.

This page shows some of the events in the early history of FM broadcasting in the United States. Note that apex stations referred to on this page used amplitude modulation on VHF frequencies; many of them evolved into FM stations. For dates involving the earliest stations, see also the "earliest FM stations" page at this website. Thanks to Bob Carpenter, Winston Tharp, Donna Halper, Steve Reggie, and Robert W. Paine, who assisted with this page. The page is maintained by Jeff Miller. Suggestions are welcome.

Last revision: Aug. 31, 2002

Call letter sequences of some stations mentioned on this page

W1XER/W39B/WMTW/WMNE Boston (Mount Washington)
W1XK/W67B/WBZ-FM Boston
W1XOJ/W43B/WGTR Paxton, Mass.
W1XPW/W65H/WDRG-FM/WFMQ/WHCN Meriden (later Hartford)
W1XSN/W81SP/WBZA-FM Springfield, Mass.
W1XSO/W53H/WTIC-FM Hartford
W1XTG/WTAG-FM Worcester
W2XDA Schenectady & **W2XOY** New Scotland (later Albany). **W57A/WGFM/WGY-FM/WRVE** Schenectady
W2XMN/WFMN/KE2XCC Alpine, N. J.
W2XOR/W71NY/WOR-FM/WBAM/WOR-FM/WXLO/WRKS New York
W2XQR/WQXQ/WQXR-FM/WQXR New York
W2XWG/W51NY/WAAF-FM/WNBC-FM/WRCA-FM/WNBC-FM/WNWS-FM/WYNY et. al. New York
W3XO Washington D. C. may be linked to **WINX-FM/WTOP-FM/WHUR**
W4XA/W47NV/WSM-FM Nashville
W8XAD/W43R/WHEF/WHEC-FM Rochester
W8XVB/W51R/WHFM/WZKC/WKLX/WBBF-FM Rochester
W8XVH/W45CM/WELD Columbus, Ohio
W9XAO/W55M/WMFEM/WTMJ-FM Milwaukee
W9XEN/W51C/WWZR/WEFM/WUSN Chicago
W9XYH/WDUL/WEBC-FM Superior, Wis.

1921. The term *wave-length modulation* appears in *Thermionic Tubes* by J. Scott-Taggart.

Feb. 1922. A paper "Notes on the Theory of Modulation" by J. R. Carson appearing in the *Proceedings of the Institute of Radio Engineers* contains the earliest known use of the term "frequency modulation": "It has been proposed..to employ an apparently radically different system of modulation which may be termed frequency modulation as distinguished from amplitude modulation, in the belief that the former system makes possible the transmission of signals by a narrower range of transmitted frequencies." The paper shows that the bandwidth required for frequency modulation is at least twice the highest modulating frequency. The paper concludes that "this method of modulation inherently distorts without any compensating advantages whatsoever."

Winter 1933-34. Armstrong demonstrates frequency modulation to executives and engineers of RCA.

Dec. 19, 1933. According to *Famous First Facts*:

1st FACSIMILE BROADCAST IN ULTRA-HIGH FREQUENCIES was made December 19, 1933, by station W9XAF, Milwaukee, Wis., on frequencies of 42,000-56,000 kilocycles and 60,000-86,000 kilocycles.

The station was not using frequency modulation.

May 1934. Edwin Armstrong begins testing at the Empire State Building.

June 16, 1934. First test conducted of Armstrong's W2XF on 41 MHz from the Empire State Building, with RCA's cooperation. He transmitted using both amplitude modulation and frequency modulation.

April 1935. Armstrong receives a message from Sarnoff telling him to remove his FM equipment from the Empire State Building. [According to one source, testing continued there until October.]

Summer 1935. Armstrong rebuilds W2AG Yonkers (Carman R. Runyon Jr.) to operate on 110 MHz.

Nov. 5, 1935. Armstrong demonstrates reception of W2AG at a meeting of the Institute of Radio Engineers 17 miles from the station. The ID for the transmission was, "This is amateur station W2AG at Yonkers, New York, operating on frequency modulation at two and a half meters."

May 1936. Armstrong's paper "A Method of Reducing Disturbances in Radio Signaling by a System of Frequency Modulation" appears in the *Proceedings of the Institute of Radio Engineers*.

June 1936. Armstrong describes his FM system at FCC hearings; critics predict the system is impractical.

July 1936. Armstrong granted experimental license for FM station.

Jan. 1, 1937. *Broadcasting* reports apex station W9XAZ Milwaukee (Milwaukee Journal) has become, as far as is known, the first apex station to originate its own programs on a regular schedule. Station operates on 26.4 MHz.

Mar. 2, 1937. The FCC authorizes two new apex stations, to WCHS Charleston WV, for the 26 MHz band, and to KGFJ Los Angeles, in the 88, 120, 240, and 500 MHz bands. These are the first apex authorizations since Jan. 21, 1936.

Mar. 9, 1937. The FCC authorizes an apex station to General Electric in Albany on 31.6 to 41.0 MHz.

Spring 1937. Shepard applies for a permit for a 50-kW FM station in Paxton.

Aug. 18, 1937. According to *Famous First Facts*:

1st FREQUENCY MODULATION (FM) CONSTRUCTION PERMIT was granted to W1XOJ, the Yankee Network, Inc., Paxton, Mass.

Oct. 18, 1937. The FCC makes public its allocation plan for VHF: 75 channels with 40 kHz separation on 41.02 to 43.98 MHz for apex stations and 16 channels in 30-40 MHz for relay stations

Late 1938. W1XPW Meriden (WDRC, Inc.) is authorized experimental operation on 40.3 MHz. (In 1936, W1XSL Meriden CT had been licensed as an amplitude modulation apex station.)

Jan. 27, 1938. FCC announces its allocation of 25 channels with 40 kHz separation from 41.02 to 41.98 for use by educational stations. Stations are to use amplitude modulation unless a need for FM can be shown.

Jan. 15, 1938. *Broadcasting* reports Yankee Network starts construction of a 50 kw FM station atop Mt. Washington and that Armstrong is building a 50 kw FM station at Alpine NJ.

Apr. 10, 1938. Edwin H. Armstrong's W2XMN carrier is turned on for the first time, 43.7 MHz, 600 watts. For more information on W2XMN, see the [E. H. Armstrong website](#).

Oct. 1938. Construction of W1XOJ begins.

Nov. 1938. WNYE New York goes on the air, using amplitude modulation.

Nov. 21, 1938. WBOE Cleveland is licensed for 500 watts on 41.5 MHz, using amplitude modulation. According to the 1961-62 *Broadcasting Yearbook*, the station went on the air in Oct. 1938.

Late 1938. W1XER moves its transmitter from Quincy to Mount Washington and begins operation on 42.3 MHz, using amplitude modulation.

Jan. 5, 1939. Apex station W8XNU Cincinnati (Crosley) begins a regular schedule of daily broadcasts, on 25.95 MHz with 1000 watts.

Jan. 11, 1939. FCC engineers listen to Armstrong's FM station from Sayville, New Jersey, 50 miles from the transmitter site. The station was operating on 42.8 MHz with 20 kw. They also listen to FM station W2AG Yonkers, operating on 110 MHz with 500 watts.

Feb. 1, 1939. *Broadcasting* reports General Electric engineers recently set up two experimental frequency modulation transmitters at Albany and Schenectady, operating on the same frequency. They drove a test car between the two cities and found almost no areas of interference between the stations. The stations were W2XDA Schenectady and W2XOY New Scotland.

Feb. 1, 1939. *Broadcasting* reports that the FCC feels that tests using frequency modulation should be expedited before apex broadcasters, using amplitude modulation, become entrenched. It reports about a dozen apex stations are licensed, and that several are receiving highly satisfactory results, notably WWJ, WKY, and WBEN.

Feb. 1, 1939. *Broadcasting* reports Professor Daniel Noble of Connecticut State College is experimenting with FM in the 100 MHz band.

Mar. 23, 1939. Armstrong demonstrates reception of his 20 kw FM transmitter at Alpine and a 600-watt transmitter at Yonkers to the Radio Club of America at Columbia University.

April 1939. Apex station W4XA Nashville begins a regular schedule of programs on 26.15 MHz.

May 13, 1939. W1XPW Meriden (WDRC, Inc.) begins on-air testing from its site atop Meriden Mountain. Station operates with 2 kw, awaiting higher power transmitter.

May 26, 1939. John Shepard in conjunction with the Institute of Radio Engineers demonstrates FM at Northeastern University for several hundred college professors, engineers, scientists, and technicians.

May 27, 1939. W1XOJ Paxton (Yankee Network) goes on the air on 43.0 MHz with 2000 watts. (To relay programming the Boston studios of the Yankee Network to Paxton, W1XOK on 133.03 MHz with 250 watts was used. Donna Halper reports this station appears to have become WEOD and then disappeared completely.)

June 1939. WTMJ applies for CP for experimental FM station

June 1, 1939. *Broadcasting* article lists stations using Armstrong modulation now in operation or under construction:

- Alpine, N. J. (Maj. E. H. Armstrong) 20-40 kw (in experimental operation)
- Washington, D. C. (Jansky & Bailey) 1 kw
- Mt. Washington, N. H. (Yankee Network) 2 kw
- New York, N. Y. (J. V. L. Hogan) 1 kw
- Storrs, Conn. (D. A. Noble) 100 w
- Rochester, N. Y. (Stromberg-Carlson) 2 kw (CP applied for)
- Meriden, Conn. (F. M. Doolittle) 1 kw
- Schenectady, N. Y. (General Electric) 10 kw
- Pittsburgh, Pa. (Westinghouse) 10 kw
- Springfield, Mass. (Westinghouse) 1 kw
- Paxton, Mass. (Yankee Network) 50 kw (in experimental operation)
- Yonkers, N. Y. (C. R. Runyon) 500 w (in experimental operation)

July 18, 1939. First day of regular programming for W2XMN Alpine (Armstrong), 42.8 MHz, 35,000 watts. The following is taken from *Rebel In Radio* by Elliott M. Sanger:

On July 18, 1939, Armstrong's transmitter carried the world's first regularly scheduled program on FM radio. The entire program originated from WQXR's studios in New York City. The telephone company had installed a special high-fidelity telephone line to carry the program from the WQXR studios to W2XMN in Alpine, New Jersey. (The first two selections were Tchaikovsky's "Haydn's Symphony No. 100" and "Francesca da Rimini.") Not too many people could listen, however, for there were just 25 FM receivers in the world. But those who did listen agreed that a revolution in radio broadcasting had taken place.

July 24, 1939. W1XOJ Paxton begins a regular schedule of 16 hours a day on the air, on 43.0 MHz. The station is still using 2000 watts but later will increase to 50 kw.

Aug 1, 1939. *Broadcasting* reports there are four groups of frequencies for FM:

- in the C group are 26.3, 26.5, 26.7, 26.9
- in the E group are 42.6 42.8 43.0 43.2 43.4
- in the G group are 117.19 117.43 117.67 117.91
- in the H group are any frequencies above 300 MHz except 400-401 MHz

Broadcasting also reports there are four stations currently in operation with Armstrong modulation: Armstrong at Alpine, General Electric at Schenectady, W1XPW Meriden (WDRC), and W1XOJ. It reports construction permits have been issued to:

- Paul Godley, consulting engineer, for a station at Alpine
- C. M. Jansky, consulting engineer, for a station in Washington
- John V. L. Hogan (WQXR) for a station at Long Island City
- Westinghouse (WBZ-WBZA) for a station at Springfield
- Head of the Lakes Broadcasting Co. (WEBC) for a station at Duluth, Minn. (which currently operates apex station W9XJL, 250 watts, which will be revamped for FM with 1000 watts on 26.3 MHz)

And it reports that applications for construction permits are

- Traveler Co., Hartford (WTIC)
- Stromberg-Carlson Co., Rochester (WHAM)
- *Milwaukee Journal* (WTMJ)
- *Worcester Telegram* (WTAG)

Aug. 29, 1939. W1XSN Springfield begins some experimental broadcasts, according to notes from Gordon Swan [Donna Halper provided this information].

Sept. 1939. W3XO Washington is placed into operation, with 1000 watts on 43.2 MHz, according to *Broadcasting* of

Nov. 1, 1939, which reports Jansky & Bailey "are experimenting with it regularly."

Oct. 15, 1939. *Broadcasting* reports WOR was recently authorized an FM station on 43.3 MHz with 1000 watts, and that it will use the call W2XWI.

Oct. 15, 1939. The abbreviation "F-M" makes its (apparent) first appearance in *Broadcasting* magazine. Beginning with the March 15, 1940, issue, the abbreviation is changed to "FM."

Nov. 1, 1939. *Broadcasting* reports, "The Commission on Oct. 24 also authorized W2XAG, F-M station at Yonkers, N. Y., operated by Carman R. Runyon Jr., pioneer experimenter with the system, to change to the high-frequency classification and to operate with 5,000 watts on 117.19 mc."

Nov. 8, 1939. W2XQR New York (John V. L. Hogan) begins broadcasting, on 43.2. The following is taken from *Rebel In Radio* by Elliott M. Sanger:

The station had applied for an FCC license to broadcast in the then new high fidelity FM band, and went on the air in November 1939, with call sign W2XQR - the first FM station in the world (barring the experimental W2XMN of Armstrong). Major Armstrong lent the station his FM transmitter which was promptly installed at 42nd Street and Lexington Avenue, atop the 54 story Chanin Building. It stayed there until the station moved to the Empire State building in December 1965.

Nov. 11, 1939. The start date for W8XVB Rochester (Stromberg-Carlson Co.), according to the 1946 *Broadcasting Yearbook*.

Dec. 3, 1939. Experimental FM relay broadcast is successful: W2XCR Yonkers broadcast a special program which was picked up by W2XMN Alpine, which relayed it to W2XPW Meriden. It was then received at the WDRC studios.

Dec. 19, 1939. FCC press release addresses issue of commercial FM licensing

Jan. 1940. NBC begins regular FM transmission from Empire State Building on W2XDG, 42.6

Jan. 4 and 5, 1940. Experimental FM relay broadcasts: W2XCR Yonkers to W2XMN Alpine to W1XPW Meriden CT to Worcester to W1XOJ Paxton MA to W1XOY at Mt. Washington to Boston AM station.

Jan. 15, 1940. W9XAO Milwaukee (The Journal Co.) begins tests on 45.5, claiming to be the first FM west of Alleghenies and fifth FM in U. S.

Feb. 2, 1940. Start date for W9XEN Chicago (Zenith).

Feb. 1940. Start date for WXAD Rochester (WHEC, Inc.).

Feb. 5, 1940. Start date for W1XSO Hartford (Travelers Broadcasting Service Corp.).

Feb. 23, 1940. W9XAO Milwaukee begins a regular program schedule.

Feb. 28, 1940. W2XOR New York (Bamberger Broadcasting Service) starts regular broadcasting under a special temporary authorization

Mar. 3, 1940. *New York Times* reports that with the introduction this month of W2XOR, there are now three frequency modulation stations in the area: W2XOR, on 43.4, with programs of the Mutual Broadcasting System; W2XMN on 42.8, which is on the air Mondays through Fridays from 4 to 11 p.m., with programs of the Columbia Broadcasting System; and W2XQR on 43.4, which broadcasts daily from 5 to 10 p.m. [The article shows two stations on the same frequency; this may be an error.]

Mar. 15, 1940. *Broadcasting* lists the status of FM stations as of March 13.

FM STATIONS LICENSED AND OPERATING

Location	Call	Licensee	Watts	Kc.
N. of Alpine, N. J.	W2XMN	Edwin H. Armstrong	40,000	42800 117430
New York City	W2XOR	Bamberger Bcstg. Service (WOR)	1,000	43400
Schenectady, N. Y.	W2XDA	General Electric Co. (WGY)	50	43200
New Scotland, N. Y.	W2XOY	General Electric Co. (WGY)	150	43200
New York City	W2XQR	John V. L. Hogan (WQXR)	1,000	43200
Washington, D. C.	W3XO	Jansky & Bailey	1,000	43200
Milwaukee, Wis.	W9XAO	The Journal Co. (WTMJ)	1,000	42600
New York City	W2XWG	National Broadcasting Co. (WEAF)	1,000	42600
Yonkers, N. Y.	W2XAG	Carman R. Runyon, Jr.	5,000	117190
Hartford, Conn.	W1XPW	WDRC, Inc.	1,000	43400
Rochester, N. Y.	W8XVB	Stromberg-Carlson Co. (WHAM)	1,000	43200
Hartford, Conn.	W1XSO	Travelers Bcstg. Service Corp. (WTIC)	1,000	43200
Springfield, Mass.	W1XSN	Westinghouse E. & M. Co. (WBZA)	1,000	42600
Columbus, O.	W8XVH	WBNS, Inc.	250	43000
Rochester, N. Y.	W8XAD	WREC, Inc.	1,000	42600
Chicago, Ill.	W9XEN	Zenith Radio Corp.	1,000	42800

FM STATIONS AUTHORIZED FOR CONSTRUCTION

Location	Call	Licensee	Watts	Kc.
Superior, Wis.	W9XYH	Head of the Lakes Bcstg. Co. (WEBC)	1,000	43000
Bethesda, Md.	W3XMC	McNary & Chambers	100	42600
Boston, Mass.	W1XK	Westinghouse E. & M. Co. (WBZ)	1,000	42600
Worcester, Mass.	W1XTG	Worcester Telegram Pub. Co. (WTAG)	1,000	43400
Boston, Mass.	W1XOJ	Yankee Network	50,000	43000
Cincinnati, O.	...	The Crosley Corp. (WLW)	1,000	43200

(Bob Carpenter believes W3XMC never went on the air.)

Mar. 15, 1940. W9XYH Superior, Wis., begins daily broadcasting, the farthest west FM station.

Mar. 18, 1940. FCC FM hearings begin

Mar. 29, 1940. Start date for W8XVH Columbus (WBNS, Inc.) 43.0 MHz.

May 20, 1940. FCC authorizes commercial FM effective July 1, 1940, on 42-50 MHz. However, the authorization is later rescinded.

June 15, 1940. *Broadcasting* reports educational stations licensed to date for amplitude modulation are WBOE Cleveland and WNYE New York, and that WBKY Beattyville, Ky., has a construction permit. "It is presumed that these, along with all other future applicants, will change to FM."

June 15, 1940. *Broadcasting* reports W2XWG is operating from 4 to 11 p.m. on Tuesdays through Saturdays on 42.6 MHz.

June 17, 1940. Start date for W1XTG Worcester (Telegram Publishing Co.).

Aug. 1, 1940. W2XOR (Bamberger Broadcasting Service) begins operation as New York's first fulltime FM station, operating 15 hours daily on 43.4 MHz with 1000 watts.

Aug. 4, 1940. *New York Times* reports on New York FM stations:

- 42.6 W2XWG operates Monday through Friday 3 p.m. to 11 p.m. experimentally
- 42.8 W2XMN operates daily 4 p.m. to 11 p.m.
- 43.2 W2XQR operates daily 4 p.m. to 10 p.m.
- 43.4 W2XOR operates daily 9 a.m. to midnight

Aug. 15, 1940. The Board of Education of the San Francisco Unified School District is granted a CP for 1,000 watts on 42.1. The station will use frequency modulation.

Sept. 1940. W1XPW begins a regular program schedule

Sept. 1, 1940. *Broadcasting* reports educational station WBOE Cleveland has requested authority to relinquish its 41.5 MHz AM operation and change to FM operation on 42.5 MHz.

Sept. 4, 1940. *Variety* reports, "WDRC is divorcing itself from its offspring FM station, W1XPW, putting same officially on its own two feet Monday [as of September 16, 1940]. At that time, W1XPW will become a separate entity, broadcasting its own programming and maintaining its own staff. Believed to be the only FM in the country to maintain its own set-up, it will operate at the start on a 12-hour a day basis." The article also said that W1XPW had been "in operation with 1000 watts power for about a year," and had applied to the FCC for a boost to 50,000 watts [Donna Halper].

Oct. 2, 1940. FCC adopts rules changes assigning frequencies with 200 kHz separation for FM broadcasting:

- For rural areas: 43.1-44.3
- For cities with population greater than 25,000: 44.5-48.7
- For cities with population less than 25,000: 48.9-49.9

[Some nice photos of FM radios which tuned to the 42-50 MHz band are available at <http://www.geocities.com/CapeCanaveral/9178/radios/fm45.html>.

More photos of FM only radios, although not quite as old, are available at http://www.somerset.net/arm/fm_only.html.]

Oct. 17, 1940. WBKY Beattyville, Ky., goes on the air at 7:30 p.m. on 42.9 MHz with 100 watts [This station probably used amplitude modulation.]

Oct. 31, 1940. FCC grants 15 stations the first construction permits for commercial FM operation:

- Detroit, Evening News Assn. (WWJ), 44.5 mc.; 6,820 sq. mi.; 2,498,000 population.
- Los Angeles, Don Lee, 44.5 mc.; 6,944 sq. mi.; 2,600,000 population.
- Schenectady, Capitol Broadcasting Co. Inc., 44.7 mc.; 6,944 sq. mi.; 967,700 population.
- New York, Marcus Loew Booking Agency (WHN); 46.3 mc.; 8,500 sq. mi.; 12,000,000 population.
- New York, NBC; 45.1 mc.; 8,500 sq. mi.; 12,000,000 population.
- New York, W. G. H. Finch; 45.5 mc.; 8,500 sq. mi.; 12,000,000 population.
- Brooklyn, N. Y., Frequency Broadcasting Corp., 45.9 mc.; 8,500 sq. mi.; 12,000,000 population.
- Evansville, Ind., Evansville On the Air Inc. (WEOA-WGBF); 44.5 mc.; 8,397 sq. mi.; 465,000 population.
- Mt. Washington, N. H., Yankee Network; 43.9 mc.; 31,000 sq. mi.; 2,000,000 population.
- Binghamton, N. Y., Howitt-Wood Radio Co. (WNBF); 44.9 mc.; 6,500 sq. mi.; 256,300 population.

- Baton Rouge, La., Baton Rouge Broadcasting Co. (WJBO); 44.5 mc.; 8,100 sq. mi.; 361,400 population.
- Columbus, O., WBNS Inc.; 44.5 mc.; 12,400 sq. mi.; 1,100,000 population.
- Salt Lake City, Radio Service Corp. of Utah (KSL); 44.7 mc.; 623 sq. mi.; 194,000 population.
- Chicago, Zenith Radio Corp.; 45.1 mc.; 10,760 sq. mi.; 4,500,000 population.
- Milwaukee Journal Co. (WTMJ); 45.5 mc.; 8,540 sq. mi.; 1,522,000 population.

Nov. 20, 1940. W2XOY Schenectady (General Electric Co.) begins transmitting on a regular schedule, according to an article in *FM* in January 1941.

Dec. 6, 1940. W1XK licensed for experimental operation (information provided by Donna Halper, from Gordon Swan's notes).

Dec. 8, 1940. The first advertising contract for FM broadcasts was signed by the Longines Watch Company and provided for the broadcasting of Longines time signals by W2XOR, New York, for 26 weeks beginning January 1, 1941. [Dec. 8 is the date from *Famous First Facts*; according to *Broadcasting* the date was Dec. 9.]

Dec. 18, 1940. W1XER Boston (Yankee Network) goes on the air as an FM station with 1 kw, transmitting from Mount Washington, according to Donna Halper. This station had previously been a 500-watt weather bureau station (W1XOY), which John Shepard converted to his second FM station.

Jan. 1, 1941. Commercial FM broadcasting is authorized to begin on this date on 42 to 50 MHz (although five frequencies are reserved for educational broadcasting).

Jan. 1, 1941. *New York Times* lists: 42.8 W2XMN; 43.5 W2XOR; 43.2 W2XQR

Jan. 14, 1941. W2XMN discontinues rebroadcasting programming of CBS, which plans its own New York FM station. W2XMN arranges a regular daily schedule of 10 hours of recorded music originating from the Associated Recording Studios.

Jan. 15, 1941. W1XOJ increases power to 50,000 watts.

Feb. 1941. Non-commercial WBOE Cleveland OH becomes an FM station.

Mar. 1, 1941. W47NV Nashville becomes the first station to be licensed for commercial operation, on 44.7 MHz with 20 kw. This station went off the air in 1951. [As stations are licensed for commercial operation, their calls are changed to a new alphanumeric system which indicates the frequency and location.]

Mar. 1, 1941. *New York Times* lists: W2XMN 42.8, W2XQR 43.2, W2XOR 43.5, W2XWG 45.1

Mar. 10, 1941. KALW is licensed to the San Francisco Unified School District, the first FM station in the western U. S.

Apr. 1, 1941. W2XOR license replaced with commercial license W71NY 47.1

Apr. 29, 1941. W1XOJ Paxton MA call changed to W43B

May 26, 1941. The first commercials exclusively for FM, for the Socony-Vacuum Oil Co., are broadcast over W43B and W39B.

July 1, 1941. *New York Times* lists: 42.8 W2XMN; 47.1 W71NY; 48.7 W2XQR.

Sept. 1, 1941. KALW broadcasts its first program, "Schoolcast," after 30 days of experimentation, according to Mullany, George G., "San Francisco Experiment in Radio Education," *California Journal of Secondary Education*, Oct. 1941, pp. 336-9.

Sept. 5, 1941. W75C Chicago (Moody Bible Institute) is authorized to operate on 47.5 MHz with a power of 1000 watts,

using a Western Electric 503-1 transmitter [according to a document with this date seen by Bob Caithamer, Director of Engineering for Moody Broadcasting].

Oct. 12, 1941. *New York Times* lists: 42.8 W2XMN, 45.1 W2XWG, 47.1 W71NY, 48.7 W2XQR

Nov. 3, 1941. WCAU-FM begins transmissions, according to a WCAU memo dated August 2, 1946 from George Lewis, Assistant Chief Engineer. [Call letters were probably W69PH at the time.]

Dec. 8, 1941. *Time* reports first FM net: W71NY New York, W2XMN Alpine, W53PH Philadelphia, W65H Hartford, W43B near Boston, W39B Mt. Washington, W47A Schenectady

Feb. 1942. *FM* magazine reports, "K45LA, Los Angeles, Don Lee station on 1,700-ft. Mt. Lee gets its programs over a 4-mile, 15,000-cycle line from the Hollywood Studios. Western Electric transmitter puts 1 kw. into the Lingo antenna shown here. Power will be increased later. Meanwhile, listeners from San Diego to Ventura are becoming FM program enthusiasts. Station is programmed independently, taking only high spots from Mutual and Don Lee nets.

Feb. 1942 *FM* magazine reports: "There are now 29 FM broadcast stations on the air with daily schedules. They are distributed as follows: Baton Rouge, 1; Boston, 1; Columbus, 1; Evansville, 1; Los Angeles, 1; Milwaukee, 1; Mt. Washington, 1; Nashville, 1; Rochester, 1; Detroit, 2; Hartford, 2; Philadelphia, 2; Pittsburgh, 2; Schenectady, 2; Chicago, 4; New York City, 6."

Feb. 1942. *FM* magazine reports, "Metropolitan Television, Inc., affiliated with Bloomingdale's department store, has been granted an extension until June 30, 1942, to complete construction of W75NY."

Feb. 1942. *FM* magazine reports, "An FM CP has just been issued to Amarillo Broadcasting Corporation for 45.1 mc. This application has been pending for many months."

Feb. 1942. *FM* magazine reports, "FM application of American Network has been designated for a consolidated hearing which will include seven applicants in the New York area."

Feb. 1942. *FM* magazine reports, "W53PH, operated by WFIL, put its full-power transmitter on the air February 10th. This is a 10-kw. R. E. L. installation. FM studios are in the Widener Building.

Feb. 1942. *FM* magazine reports, "Leonard Ash, president of Capitol Broadcasting Company, Inc., has straightened us out on the ST link situation. Yankee Network's link transmitter operating on 133.03 mc., was the first FM type to be installed. However, Capitol's transmitter was the first to be put into commercial service in the new 331 mc. band. It operates over an airline distance of 12 miles."

Feb. 1942. *FM* magazine reports, "Zenith Radio Corporation, operating W51C, has received a letter from a listener in Monterey, Mexico, telling of daily reception of this station between 3:00 P. M. and 6:00 P. M. This is the greatest distance, 1,100 airline miles, from which consistent reception of the 50 kw. transmitter has been reported."

Mar. 1942. *FM* magazine reports, "The FM end of the GE broadcasts are originating at W47NY, from which they are picked up on W2XMN, and distributed on FM frequencies to W65H, and north to W43B and W39B, to W2XOY and W47A, and to W53PH. The program is transmitted on Tuesdays, Thursdays, and Saturdays at 6:30 to 6:45 p.m. on the FM stations, and at 6:00 to 6:15 P. M. on the 51 CBS stations."

Mar. 1942. *FM* magazine reports, "From this eminence at 500 Fifth Avenue, New York City, CBS is now maintaining a regular FM program schedule. When the antenna is completed, the 3-kw. G. E. transmitter will cover 12,000,000 listeners. Meanwhile, with a temporary antenna, W67NY is putting out a splendid signal, and adding greatly to the entertainment of listeners in the New York area."

Mar. 1942. An article by Arnold Nygren, chief engineer of WFIL-W53PH, Philadelphia, in *FM* magazine, reports that W53PH is using a 10-kw REL type 520 DL transmitter and a 50-foot four-bay Lingo antenna on top of a 250-foot tower on the roof of a 255 foot building. The article also reported that beginning in January 1942 W53PH inaugurated a monthly program booklet, and that over 1,300 subscribers received the February booklet.

Mar. 1, 1942. *New York Times* lists: 42.8 W2XMN, 44.7 W47NY, 45.1 W2XWG, 45.9 W2XQR, 47.1 W71NY.

Aug. 1, 1942. *New York Times* lists: 42.8 W2XMN, 44.7 W47NY, 45.1 W2XWG, 45.9 W2XQR, 46.3 W63NY, 46.7 W67NY, 47.1 W71NY

July 11, 1943. *New York Times* reports W2XQR has changed to W59NY

Sept. 19, 1943. *New York Times* lists: 42.8 W2XMN, 43.9 W39NY, 45.1 W2XWG, 45.9 W59NY, 46.3 W63NY, 47.5 W75NY.

Nov. 1, 1943. The unpopular alphanumeric call system is scrapped and purely alphabetical call letters are adopted; W45CM to WELD, W75C to WDLM, W43B to WGTR, W65H to WDRC-FM, W53H to WTIC-FM, W81SP to WBZA-FM, W67B to WBZ-FM, etc.

Nov. 1, 1943. *New York Times* lists: 42.8 W2XMN, 43.9 WNYC-FM, 45.1 W2XWG, 44.7 WGYN, 45.9 WQXQ, 46.3 WHNF, 46.7 WABC-FM, 47.1 WOR-FM, 47.5 WABF

Jan. 1, 1944. *New York Times* lists: 42.3 W2XMN, 48.9 (sic) WNYC-FM, 44.7 WGYN, 45.9 WQXQ, 46.3 WHNF, 46.7 WABC-FM, 47.1 WBAM, 47.5 WABF

May 10, 1944. *New York Times* lists: 42.3 W2XMN, 43.9 WNYC-FM, 44.7 WGYN, 45.1 W2XWG, 45.9 WQWQ, 46.3 WHNF, 46.7 WABC-FM, 47.1 WBAM, 47.5 WABF

July 22, 1944. W9XEK Louisville goes on the air on 45.5 MHz. The following information was taken from a [WHAS station history page](#):

July 22, 1944	W9XEK went on the air on 45.5MHz
Apr 20, 1947	Program service on WCJT (99.7 MHz) started. Call letters stood for Courier Journal Times. The antenna was at WHAS' Eastwood site.
May 7, 1948	W9XEK taken off the air
May 21, 1948	Authority granted to change call letters of WCJT to WHAS-FM.
Dec 31, 1950	FM license canceled and WHAS-FM goes dark.

Jan. 15, 1945. FCC announces allocations proposals, moving FM to 84-108 MHz, with 84-88 MHz reserved for noncommercial FM broadcasting.

May 21, 1945. FCC announces allocation of spectrum above 25 MHz with exception of 44-108 MHz but delays decision as to placement of FM for propagation studies to be made by FCC and industry engineers. The 44-108 MHz spectrum is to be allocated, following tests, on one of the following three alternatives:

Alternative 1: 44-48 Amateur; 48-50 Facsimile; 50-54 Educational FM broadcasting; 54-68 Commercial FM broadcasting; 68-74 Television; 74-78 Non-Government fixed and mobile aero markers on 75 MHz to remain as long as required; 78-108 Television, fixed, mobile [shared].

Alternative 2: 44-56 Television; 56-60 Amateur [the same as pre-WW2]; 60-66 Television; fixed; mobile [shared]; 66-68 Facsimile; 68-72 Educational FM broadcasting; 72-86 Commercial FM broadcasting; aero markers remain on 75 MHz as long as required; 86-92 Television; 92-104 Television, fixed, mobile [shared]; 104-108 Non-Government fixed and mobile.

Alternative 3: 44-50 Television, fixed, mobile [shared] 50-54 Amateur; 54-78 Television, fixed, mobile [shared] aero markers remain on 75 MHz as long as required; 78-84 Television; 84-88 Educational FM broadcasting; 88-102 Commercial FM broadcasting; 102-104 Facsimile; 104-108 Non-Government fixed and mobile.

Middle 1945. For a three month period in mid-1945, WMFM programs were broadcast on both the regular 45.5 mc channel, and on an experimental channel of 91 mc. with reception compared 80 mi away. (Report submitted Sept. 1945)

June 4, 1945. *Broadcasting* reports FM Broadcasters Association and Television Broadcasters Association ask FCC to allocate: FM 50-54 MHz educational, 54-68 MHz commercial; TV 68-74 MHz and 78-108 MHz

June 27, 1945. FCC allocates 88-108 MHz for FM broadcasting, with 88-92 MHz to be reserved for noncommercial broadcasting, and allocates 106-108 MHz for facsimile broadcasting. Within the 92-106 MHz spectrum, FM stations are to be allocated as follows: 92.1-93.9 community; 94.1-103.9 metro; 104.1-105.9 rural.

Sept. 12, 1945. FCC issues rules for FM broadcasting. Assignments for existing stations in the new band are as follows, with later revisions in parentheses:

Alpine	WFMN	100.9 (98.9)
Baton Rouge	WBRL	96.1
Binghamton	WNBF-FM	96.7 (96.3)
Boston	WBZ-FM	95.7 (100.7)
Chicago	WBBM-FM	99.3
Chicago	WDLM	99.7
Chicago	WEHS	100.1
Chicago	WGNB	98.9
Chicago	WWZR	98.5
Columbus	WELD	94.5
Detroit	WENA	96.9
Detroit	WLOU	96.5
Evansville	WMLL	94.7
Ft. Wayne	WOWO-FM	95.9
Hartford	WDRC-FM	94.3
Hartford	WTIC-FM	93.5
Indianapolis	WABW	94.9
Jersey City	WAAW	96.1 (94.1)
Kansas City	KMBC-FM	97.9
Kansas City	KOZY	99.9
Los Angeles	KHJ-FM	99.7
Los Angeles	KTLO	100.1
Milwaukee	WMFM	92.3
Mt. Washington	WMTW	97.9 (98.1)
Nashville	WSM-FM	100.1
New York	WABC-FM	97.3 (96.9)
New York	WABF	98.5
New York	WBAM	96.9 (96.5)
New York	WEAF-FM	97.7 (97.3)

New York	WFGG	99.7
New York	WGYN	100.1 (96.1)
New York	WHNF	99.3
New York	WNYC-FM	98.1 (94.5)
New York	WQXQ	100.5 (97.7)
Philadelphia	KYW-FM	93.1 (100.3)
Philadelphia	WCAU-FM	95.5 (102.7)
Philadelphia	WFIL-FM	94.3 (103.1)
Philadelphia	WIBG-FM	95.1 (97.1)
Philadelphia	WIP-FM	93.9 (97.5)
Philadelphia	WPEN-FM	95.9 (99.5)
Pittsburgh	KDKA-FM	94.1
Pittsburgh	WTNT	94.5
Rochester	WHFM	98.9
Rochester	WHEF	98.5
Salt Lake City	KSL-FM	100.1
Schenectady	WBCA	95.7 (101.1)
Schenectady	WGFM	95.3 (106.7)
Springfield	WBZA-FM	99.1 (97.1)
Superior	WDUL	92.3
Winston-Salem	WMIT	97.3
Worcester	WGTR	101.7 (103.1)
Worcester	WTAG-FM	102.1 (102.7)

Dec. 24, 1945. *Broadcasting* reports FCC announces tentative allocations plan for FM, providing for over 1500 stations; makes 32 more conditional grants, bringing total to 229

Jan. 10, 1947. On this date 25 FMs are still in the low band.

Jan. 5, 1949. Armstrong obtains temporary restraining order from Washington Circuit Court of Appeals allowing him to stay on 44.1 (brought as a result of July 1946 order eliminating lower FM band)

Apr. 29, 1952. The first multiplex broadcast during regular programming by KE2XCC. A carrier of 25 kHz was used, with a frequency swing of +/- 5 kHz.

Feb. 1, 1954. Edwin Armstrong dies

Mar. 6, 1954. KE2XCC goes off the air. At 7 p.m. the station aired a program in memory of Armstrong; at 8:57 "This is the last program of our 15 years of broadcasting"; Star-Spangled Banner; "As we prepare to pull the switch and shut the station down, we salute the memory of Edwin Howard Armstrong."

Oct. 12, 1955. The first SCA grants are made to WPEN-FM in Philadelphia and WWDC-FM in Washington.

Apr. 24, 1961. *Broadcasting* reports the FCC approves stereo multiplex standards.

June 1, 1961. FM stereo broadcasting is authorized to begin; on this date the FCC received its first notifications of such regular operation, from WEFM Chicago and WGFM Schenectady. Both stations had previously experimented with stereo broadcasting, as had others. [According to Ed Ellers, WGFM was first to broadcast in stereo, as WEFM had to wait an extra hour because of the difference in time zones.]

1962. FCC revises FM rules, dividing the country into three zones (instead of the previous two), creating class A, B, and C stations, and adopting power limits for each class.

[Return front page](#)

Telegraph Timeline

Data Communications Time-line by Don R. House, N.S.E.

Data in communications is defined as information transmitted in real time over a medium to a distant location other than voice.

Prior to 1300
FIRE, SMOKE, BELLS, TRUMPETS, DRUMS AND GUNS

1300 to today
FLAGS AND SEMAPHORE

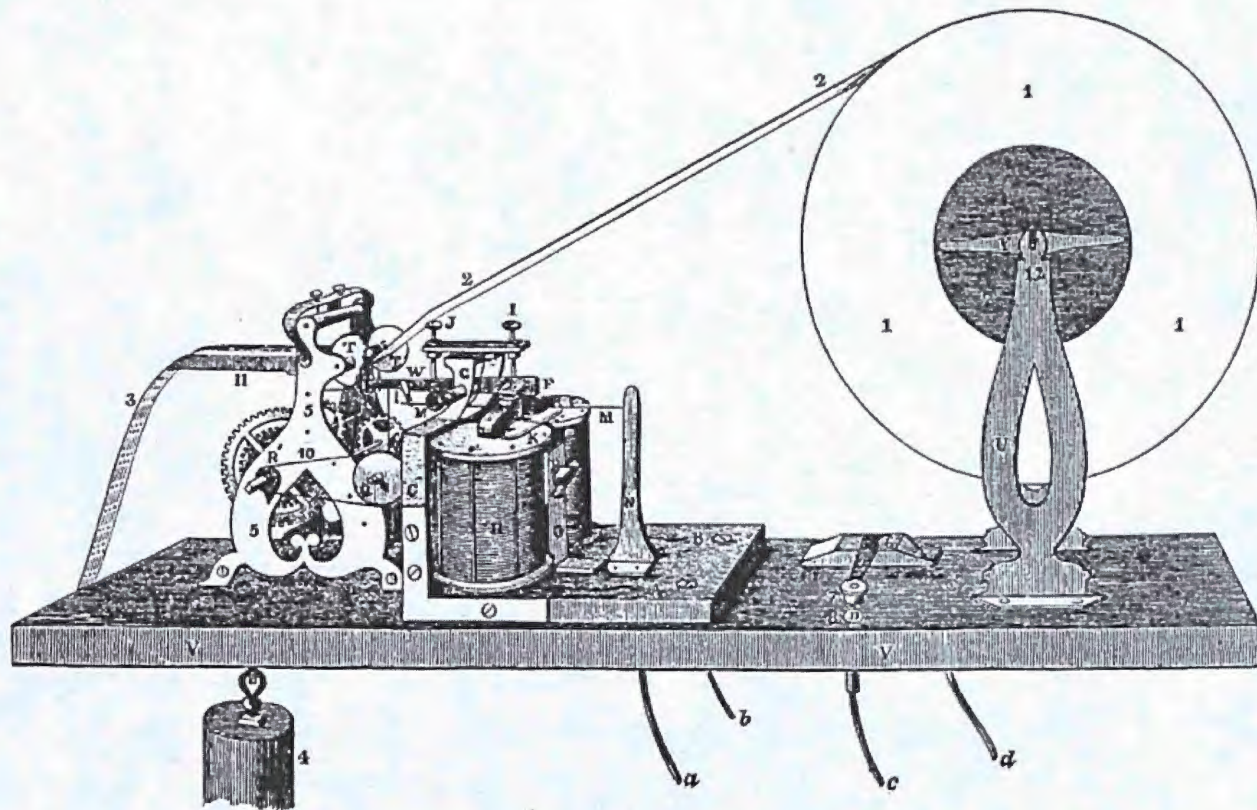
1800
Telegraph defined from the Greek... TELE = Afar GRAPHOS = Write

1809
First telegraph in Bavaria. Samuel Soemmering. Used 35 wires with gold electrodes in water. Detection at distant end 2000 feet away was by the amount of gas caused by electrolysis.

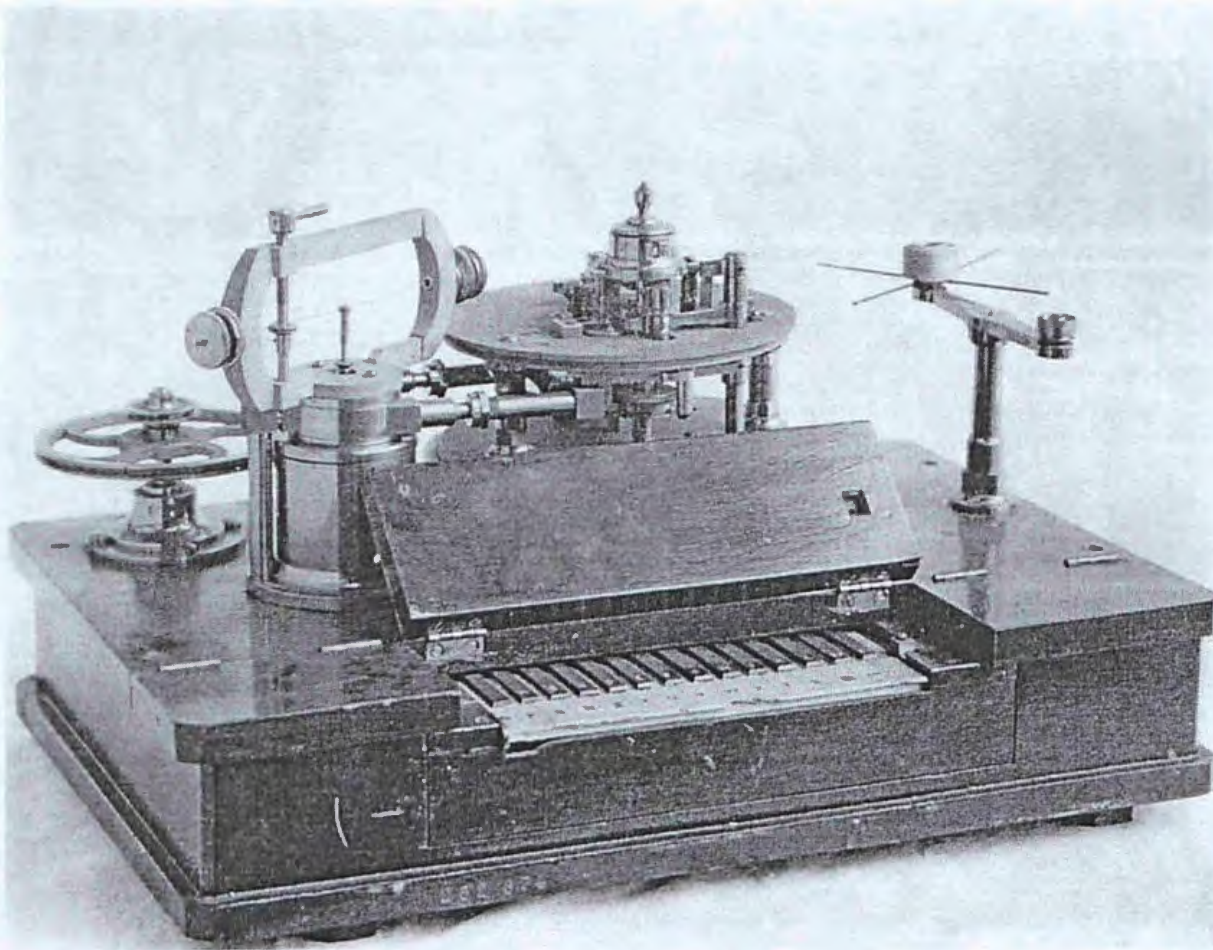
1828
First telegraph in the USA. Harrison Dyar sent electrical sparks through chemically treated paper tape to burn dots and dashes.

1840
Samuel F.B. Morse and Alfred Vail were issued a patent for the first practical telegraph based on electromagnets. Relays were used every 10 miles to repeat the signals. In Morse coding there are 11 different characters between American and European codes.

1845
Samuel Morse and Alfred Vail introduce a Morse printer that uses ink and electromagnets to print dots and dashes on paper tape.



(Courtesy of Smithsonian Institution, Washington, D.C.)
MORSE-VAIL 1845 TELEGRAPH



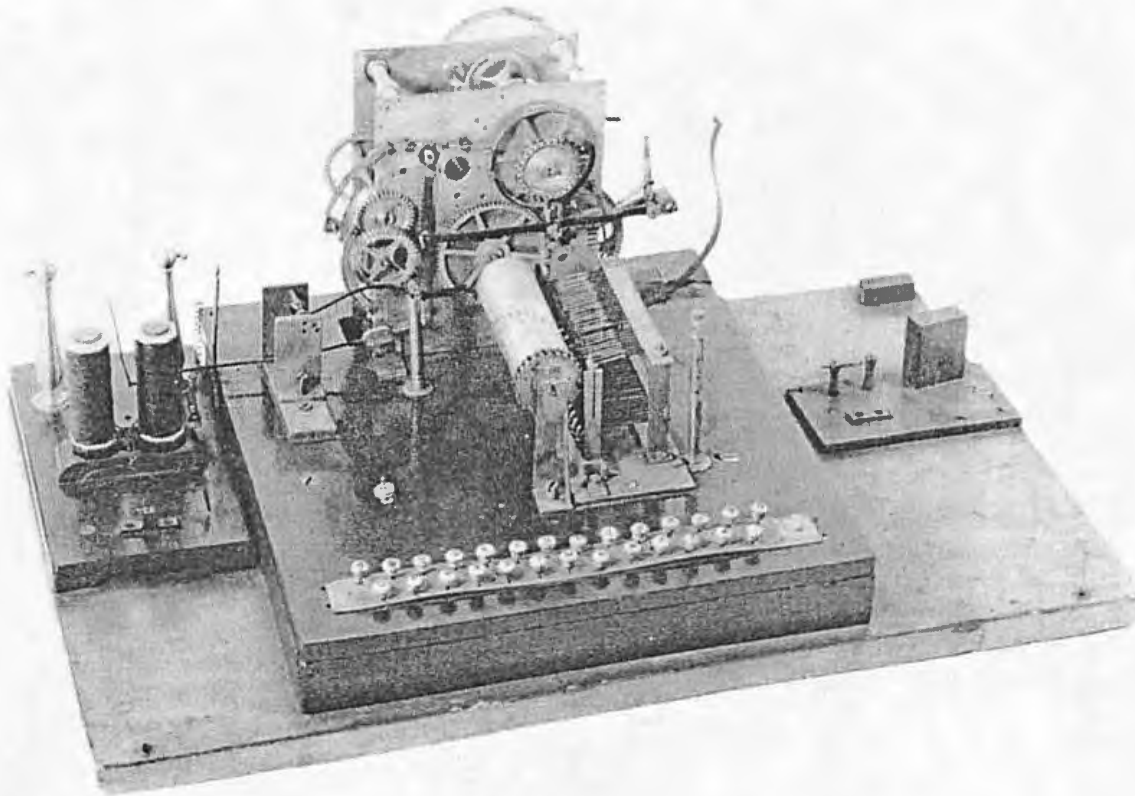
(Photograph courtesy of Smithsonian Institution, Washington, D.C.)
1845 PATENT OFFICE MODEL OF HOUSE'S PRINTING TELEGRAPH

1846

Royal E. House of Vermont produces a printing telegraph that uses paper tape, a type-wheel and a piano style keyboard. One key for each character.

1856

David Hughes, a music professor in Kentucky uses a vibrating spring tuned to a specific pitch to synchronize the sending and receiving teleprinter with use a code invented by him.



(Courtesy of Smithsonian Institution, Washington, D.C.)

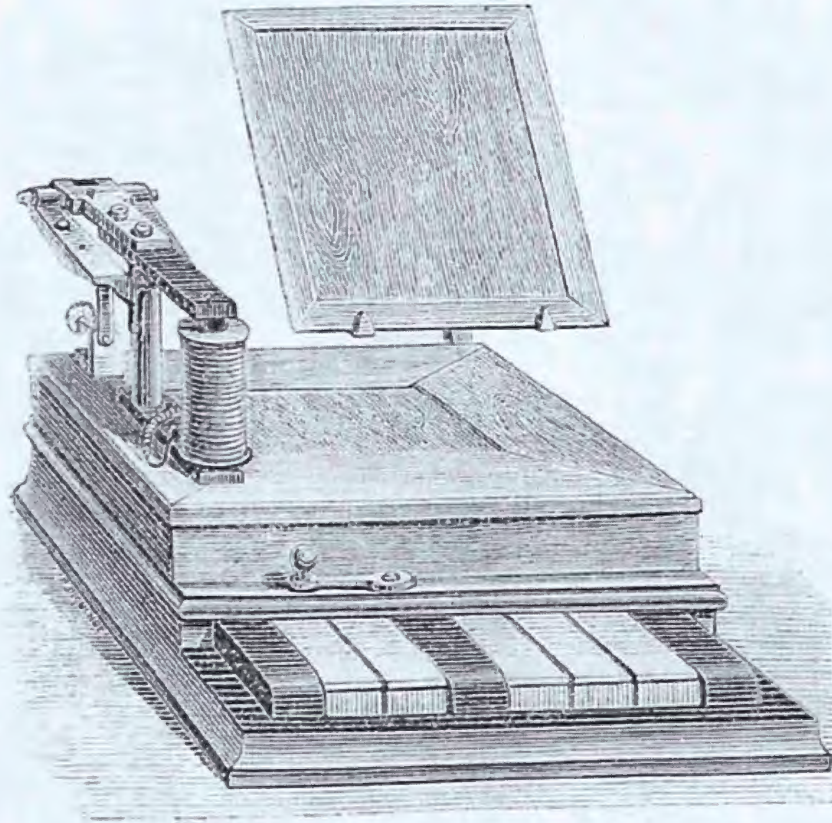
1856 PATENT OFFICE MODEL OF HUGHES' PRINTING TELEGRAPH

1865

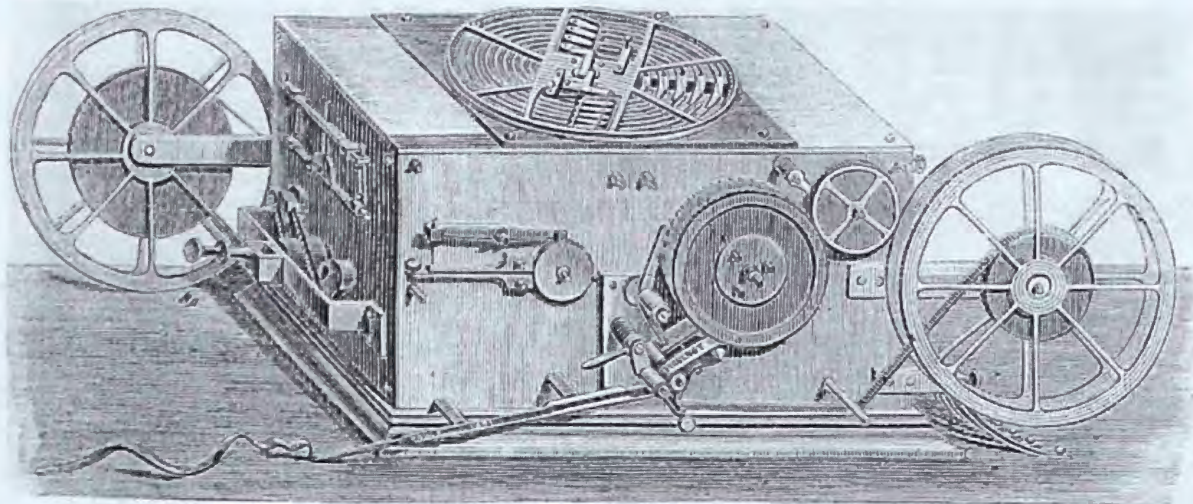
Telegraph becomes the greatest means of communications ever. Over 83,000 miles of wire in the USA alone dedicated to telegraph. At the same time development of the telephone begins.

1874

J.M.E. Baudot in France invents the multiplex telegraph system where at least 4 stations can transmit simultaneously (actually serially) through the use of a distributor. The transmitters are like a miniature piano with five keys. Each combination of keys equals a character. Paper tape is used as the printed media.



(Courtesy of Smithsonian Institution, Washington, D.C.)
1874 BAUDOT'S MULTIPLEX TELEGRAPH TRANSMITTER KEYBOARD



(Courtesy of Smithsonian Institution, Washington, D.C.)
1876 ONE OF THE BAUDOT MULTIPLEX RECEIVERS

1880

Baudot's 5 unit code forms the basis for the european standard CCITT International Telegraph Alphabet

No. 1 (ITA-1)

1901

Donald Murray improves the 5 unit code with new character assignments and adds two shifts. This becomes the basis of CCITT Alphabet No. 2 (ITA-2) which is still in use one hundred years later.

1902-1907

Charles Krum perfects the 5 unit ITA-2 code with a start-stop sequence to allow teletypewriters to be used in commercial applications. One coded character is 7.42 unit intervals.

e.g. START, ONE, TWO, THREE, FOUR, FIVE, STOP= 1.42 unit intervals made possible the mass mechanization of telegraph.

Jay Morton of the Morton Salt dynasty funded Krum's experiments.

1906

The Morkrum Company was established with its ownership shared by Charles Krum and the Morton family.

1908

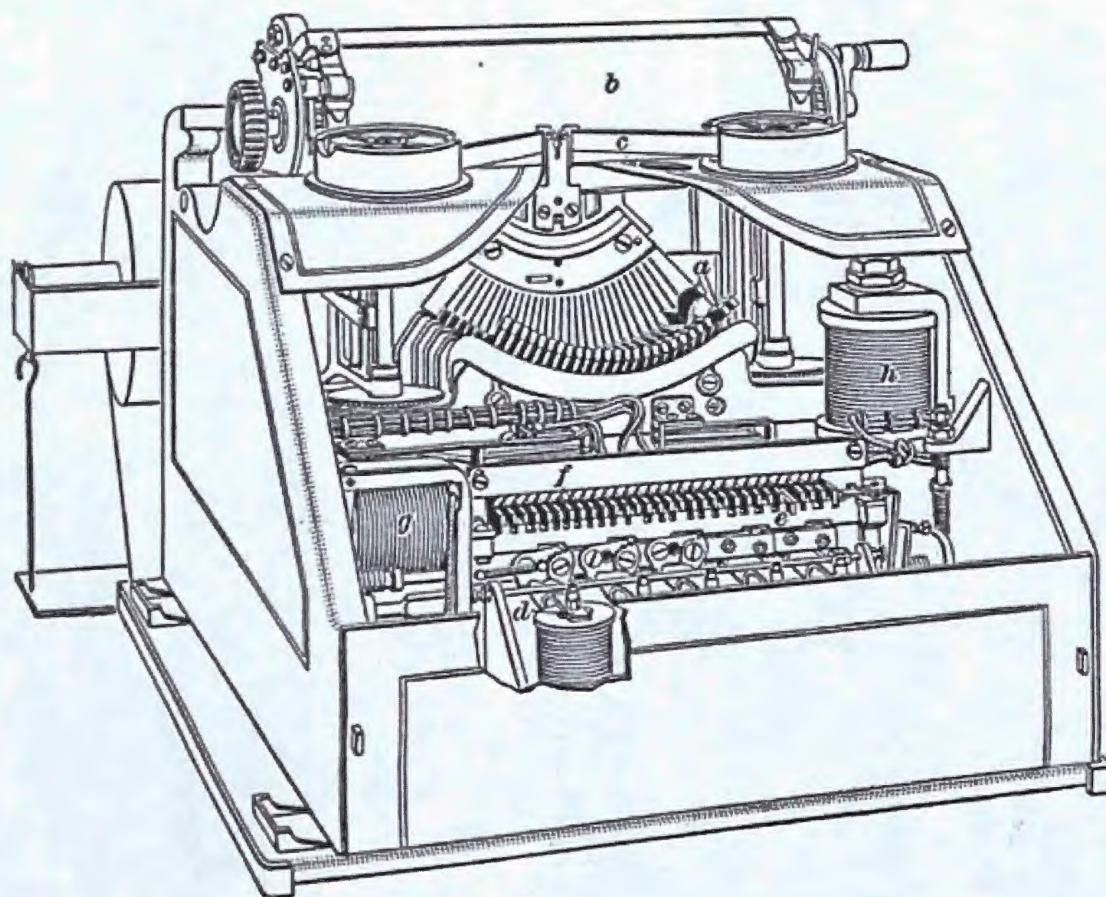
The Morkrum Company developed its first commercial printer. A field trial was conducted with the Alton Railroad. The trial was successful, but the Alton Railroad made no purchase.

1910

The Postal Telegraph purchased the first commercial Morkrum equipment. In 1912, Western Union (having split from Western Electric) purchased the same device. Although these M10 units were mechanically successful, none were commercially successful until 1925.

1915

The Associated Press adopted Morkrum M10 printing telegraph equipment to provide simultaneous service to competitive newspapers in New York City.



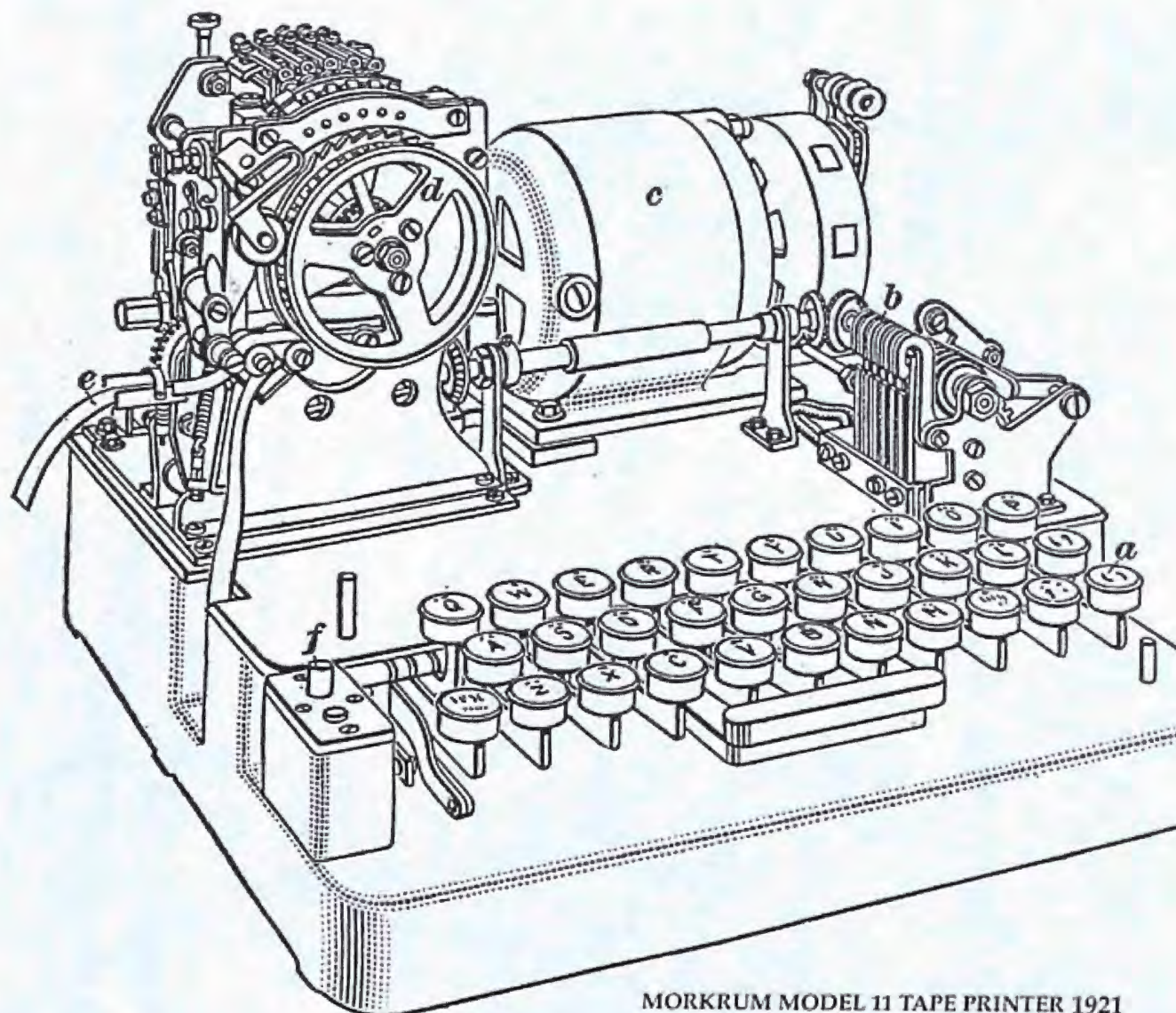
**Circa 1915 Type Bar Page Printer
Kleinschmidt and Morkrum similar in design**

1918

Morkrum Company operation was expanded from its "garage" type facility. Employees numbered "over 200".

1921

The M11 type-wheel tape printer, went into production. It constituted the first commercially acceptable and successful unit, The M11 was manufactured through 1927 with 883 machines being produced.



MORKRUM MODEL 11 TAPE PRINTER 1921

1922

The M12, a type-bar page printer with moving platen, was first marketed. Previous to 1922, printing telegraph was limited largely to commercial-telegraph and railroad uses. The M12 page printer opened the way to general business uses. Substantial numbers of this unit were sold through 1930, with quantity, too, being sold as late as 1943. A total of 11,899 M12 units were sold.

1925

The M14 type-bar tape printer was first marketed. The machine reached its highest production in 1929 and 1930. A total of 60,000 units had been sold when the device was manufacture discontinued in the late 1950s.

1925

The Morkrum & Kleinschmidt Companies merged to form the Morkrum-Kleinschmidt Company.

1929

The title Morkrum-Kleinschmidt was found to be too cumbersome and was dropped in favor of

"Teletype."

1930

The M15 type-bar page printer with stationary platen was introduced. This machine soon became the "bread and butter" unit of Teletype, reaching its peak output during WWII. Through 1954, about 200,000 were sold. A large percentage of Bell System Teletypewriter Exchange (TWX) stations were of the M15 vintage.

1930

The Teletype Corporation was purchased by the Bell System and became a wholly owned subsidiary of the Western Electric Corporation. The Bell System at this time, was formulating plans for a new teletypewriter exchange service called TWX. The Teletype Corporation was selected and purchased to provide the necessary equipment for the proposed service.

1932

TWX (Teletypewriter Exchange Service) was inaugurated by the Bell System. Terminal equipment provided by the Teletype Corporation was of the M15 type.

1941

The M14 tape punch was first marketed. Approximately 50,000 units were sold through the late 1950s when the device was manufacture discontinued. About 90% of all effort at Teletype was devoted to the war.

1946-1950

Models 19 and 20 developed for auto-control of transmission - 19ASR and for 6 unit teletypesetting - the Model 20

1951

The first M28 page printer was delivered to the Navy. This represented approximately 12 years of research and development effort. The M28 line was accepted by the Bell System as a successor to the M14, 15 and 19 lines of equipment in 1956. The M28 design principle constituted the corporations basic approach to both message and data recording equipment until 1960.

1953

The first "DataPhone" is developed by Bell Laboratories. About the size of a small desk it operates totally analog circuitry at the speed of 50 bps. Model 29 was scheduled to replace the Model 20, but it never happened. Model 31RO and KSR Tape Printer is invented for the miliary.

1960

Teletype Corporation assembles for the first time under one roof in their new quarters in Skokie, Illinois. A multi-million dollar plant with a million and a half square feet of operating area and employing over 6,000 workers, it represented a milestone in the history of the Teletype Corporation. Manual TWX stations are all converted to dial.

1961

The Model TT-242 is rejected by the Navy in favor of the MITE compact teletypewriter. It becomes the basis for the model 32 and 33. The M35 and M33 lines of equipment. While the M35 is merely an 8 level version of the M28, the M33 represented the marriage of many proven designs into a totally new design, best described by the term "low cost concept." Approximately 6 years of research and development went into the Models 242, 32 and 33.

1962

First generation Bell System DataPhones (modems) are sold commercially. Speeds offered are from 45 to 2400 bits per second.

1962-1974

American Standard Code for Information Interchange (ASCII) as a standard code set is developed and standardized by Electronic Industry Association (EIA)

1966

Analog Wide-Band Data service is first offered using specially built facilities able to transmit and receive data at 50 kilobits per second. Don House starts with Illinois Bell Telephone Co., the highest revenue earner in the Bell System with over 44,000 employees.

1968

The first and longest strike against the Bell System by members of the Communications Workers of America and the International Brotherhood of Electrical Workers. The strike lasts almost 6 months.

1972

Digital Data Service (DDS) is started up by the Bell System offering synchronous digital data communications services from 2400 bits per second (bps) to 56000 (56K) bps. DDS is the single greatest advance in the history of data communications by pioneering the transmission of totally high speed digital signals.

1968-1978

Much development goes into new concepts and new forms of data station equipment. "Machines that make data move" becomes Teletypes trade slogan. Devices such as the Dataspeed paper tape senders and receivers operating at 750 - 2000 words per minute. The Inktronic printer that sprayed 80 characters at a time on a roll of paper at 2400 words a minute. R & D is working overtime on new projects for the Bell System and the government. TWX is sold to Western Union.

1978-1979

Second generation Dataphones now offered by the Bell System at speeds up to 19200 bps. Increased competition takes away sales.

1979-1984

The Teletype Corporation produced the newer "Black line" of Model 40, 4540 electronic display terminals and chain type based printers. The Models 42 and 43 dot matrix terminals are introduced. They also produced the Magnetic Tape Terminal as an adjunct for both the Models 43, and 40 lines of equipment.

1984-1989

Divestiture of the Bell System. Teletype name is dropped along with its logo to be replaced by AT&T and the "Death Star" logo. Operations in Skokie are discontinued and operations consolidate in Little Rock, Arkansas. Many employees are laid off. Then the operation in Little Rock manufacturing the 5310 terminals and printers is closed down and moved to Singapore, China.

1984-1996

It was during this period that Don House founded and began what is now incorporated as the North American Data Communications Museum (NADCOMM) a California Not-For-Profit, Public Benefit Corporation. The museum collective now has 5 locations across the country. The museum is operated

U.S. POLICY: THE COMMUNICATIONS ACT OF 1934

U.S. Communications Policy Legislation

This legislative act remains the cornerstone of American television policy six decades after its initial passage. Though often updated through amendments, and itself based on the pioneering Radio Act of 1927, the 1934 legislation which created the Federal Communications Commission has endured remarkably well through an era of dramatic technical and social change.

Congress first specifically regulated broadcasting with its 1927 Radio Act which created a Federal Radio Commission designed to regulate in "the public interest, convenience, or necessity." But federal regulation of communications was shared by the Department of Commerce and the Interstate Commerce Commission. By 1934 pressure to consolidate all telecommunication regulation for both wired and wireless services prompted new legislation with a broader purpose.

President Franklin Roosevelt's message requesting new legislation was published in January 1934, the Senate held hearings on several days in March while the House held a single day of hearings in April, a conference report melding the two differing bills together appeared in early June, and the act was passed on 19 June. Given the act's subsequent longevity, it generated little controversy at the time it was considered. Few proposed substantial alteration of the commercially-based broadcast system encoded in the 1927 law. Some critics expressed concern about educational radio's survival--and though Congress mandated the new FCC to consider setting aside some frequencies for such stations, this only occurred in 1941 with approval of FM service.

Running some 45 pages in the standard government printed version as originally passed, the act is divided into several dozen numbered sections of a paragraph or more which were originally divided into six parts called titles (a seventh was added in 1984 concerning cable television). The first title provides general provisions on the FCC, the second is devoted to common carrier regulation, the third deals with broadcasting (and is of primary concern here), the fourth with administrative and procedural matters, the fifth with penal provisions and forfeitures (fines), and the sixth with miscellaneous matters.

The act has been updated through amendment many times--chiefly with creation of public television in 1967 (provisions on the operation and funding of the Corporation for Public Broadcasting expanded title III), and the cable act of 1984 (which created a new title VI devoted to cable regulation, sections of which were expanded in cable legislation of 1992).

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See also [Allocation](#); [Educational Television](#); [Freeze of 1948](#); [License](#); [Ownership](#); [Public Interest Convenience and Necessity](#); [U.S. Policy: Telecommunication Act of 1996](#)

Attempts to substantially update or totally replace the act have arisen in Congress several times, most notably during a series of "rewrite" bills from 1977 to 1982, and again in the mid-1990s. Such attempts are driven partly by frustration with legislation based upon analog radio and telephone technology still in force in a digital era of convergence. They are driven as well by increasing rivalries among competing industries--broadcast, cable, telephone and others. They are also driven by political ideology that argues government should no longer attempt to do all things for all people--and by economic constraints that force government to operate more efficiently. The 1934 act, despite its many amendments, is increasingly seen as an anachronism needing replacement to match today's needs.

-Christopher H. Sterling



Regulation of Industry, U.S. Legislation

Communications, 1862–1990

From the first telegraphs to microwave, fiber optics, and satellite transmission, this collection follows the close but often uncomfortable relations between Congress and the nation's electric/electronic communications industry.

No industry could be more "affected with a public interest" than that of sending messages. Yet the paths those messages can take are often limited, either by nature or by cost considerations. The individual user looks for privacy, efficiency, and reasonable prices. And the community depends on its communications for its security, from local emergency services to national defense.

The traditional American preference for unfettered private enterprise has doubtless prompted the pace of innovation and growth in this field, but it has also conflicted with other traditional values. The arena of these conflicts is most often the Congress.

This collection traces the long history of federal communications regulation through the documents created by Congress—not only the statutes but also the committee reports, prints, and related documents behind the statutes.

Regulation first came just after the Civil War, in the form of preferential federal telegraph rates on a line to be built with federal money across the West to San Francisco. From the Post Roads Act of 1866 onward, telegraphy would depend on an increasing variety of permissions and restrictions throughout its history—a troubled history after the rise of the telephone system.

Telephone lines were early recognized as a "natural monopoly" in any given area. The dominant firm, American Telephone and Telegraph, would also monopolize long-distance connections, though under restraints imposed by both federal and state regulators.

Once defined as "common carriers" (in the Mann-Elkins Act, 1910), telephone companies, like telegraph and cable companies (and major forms of transportation) were obliged to provide service even where it was unprofitable. By the 1970s, this would make AT&T vulnerable to competition from unregulated firms such as MCI, which used microwave technology to underbid AT&T for the most profitable long-distance business. When AT&T resisted having to provide local connections for its rivals, the ensuing court decision (1982) mandated the breakup of the old company and a reconfiguration of the industry that would take years to clarify in all its ramifications.

Radio was first regulated only in the interests of ship safety, in the Wireless Ship Act of 1910. Although World War I brought some centralized controls under the navy, and 1919 saw the founding of the giant Radio Corporation of America, the industry was near chaos when the Radio Act of 1927 was passed. It gave the new Federal Radio Commission power to assign frequencies and issue renewable three-year licenses.

The largest landmark in policy and enforcement was the Communications Act of 1934 and its

creation, the Federal Communications Commission, which has from that time been the primary regulator of all common carriers of messages, whether radio, telephone, telegraph, cable, or, later, television and satellites. This collection traces the rapid changes in technology and their impact on the enormous and complex industry that processes information and entertainment not only for Americans but for much of the world.

As the documents make clear, deregulation has also been a significant trend since it began during the late 1970s. It may have reached a crest for the present (cable television's deregulation lasted only from 1984 to 1992), but whatever the future holds, America's place in the world's competition for profitable, efficient, and democratically responsive communications systems will be debated and, to a large extent, determined in the Congress.

A companion printed guide provides access to the collection. The guide contains an introductory essay, a reference bibliography, and detailed indexes by subjects and names, titles, document and report numbers, and Superintendent of Documents numbers.

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History has been marked by occasional dramatic jumps in technology. The majority of progress, however, has been made in incremental amounts -- one development leads to a second, and so on. With the technology base available today, the future of broadcasting will be exciting, indeed.

Major Industry Milestones

The Pioneers

- 1875 Thomson transmits wireless signals
 - 1876 Bell invents the telephone
 - 1884 Scanning disc for mechanical television invented by Paul Nipkow
 - 1886 Principle of magnetic recording discovered by Oberlin Smith
 - 1887 Hertz sends and receives radio waves
 - 1889 Film developed by Eastman and camera developed by Edison combined to produce the first motion picture system
 - 1895 Marconi develops radio transmitter and receiver
 - 1896 Kodak develops first motion picture film designed for projection
 - 1897 First cathode ray tube scanning device constructed by German scientist, Karl Ferdinand Braun
 - 1898 Poulson patents principles of magnetic recording
-

The Nineteen Hundreds

- 1900 Sarnoff emigrates to the U.S. from Russia at age 9
- Professor Reginald A. Fessenden transmits speech without wires
- 1901 Marconi receives first transatlantic radio signals
- 1904 Vacuum tube diode developed by Fleming
- 1905 Nipkow disc demonstrated
- Cathode-ray picture tube (CRT) demonstrated
- 1906 Vacuum tube triode developed by DeForest. First amplifier constructed
- 1907 Boris Rosing in Russia and A.A. Campbell-Swinton in England simultaneously develop image reproduction methods using electromagnetic scanning

1909 Herrold makes first successful radio broadcast at San Jose, CA

The Nineteen Tens

1910 First federal communication law, the Wireless Ship Act, enacted

1912 DeForest and Armstrong independently discover regeneration

Sarnoff intercepts first distress message from the doomed ship Titanic

1913 Edison uses first diamond stylus in Amberola phonograph

1915 First practical radio telephone communications system constructed by Bell Labs

1917 9XM-WHA begins radio transmission from the University of Wisconsin at Madison

1918 Armstrong invents the superheterodyne receiver

1919 Hoxie develops a means of recording sound on motion picture film

Radio Corporation of America founded

The Nineteen Twenties

1920 KDKA airs the world's first scheduled radio broadcast from Pittsburgh

WWJ, Detroit, begins operation

1921 Aeriola Jr. designs the first affordable home radio

Radio Central, Rocky Point, NY, opened by RCA

1922 Armstrong invents super-regeneration system

WLW, Cincinnati, receives broadcast license

Farnsworth investigates electronic picture transmission

1923 Zworykin patents the Iconoscope pickup tube for television: complete TV system including kinescope, or picture tube, demonstrated

National Association of Broadcasters (NAB) formed

1924 Radio Manufacturers Association, predecessor of EIA, founded

1925 Rice and Kellogg develop first practical loudspeaker

Baird (Great Britain) demonstrates first TV pictures via a mechanical system

1926 National Broadcasting Company founded

Alexanderson develops scanning disc TV system

1927 Farnsworth transmits first electronic TV picture; applies for patent on electronic television

Bell Telephone Laboratories demonstrates wireless TV between Whippany, NJ and New York

Columbia Broadcasting System founded

AC bias discovered for recording machines

1928 Federal Radio Commission established

Pfleumer patents magnetic tape

Image Dissector developed

WGY-TV, Schenectady, NY, transmits 40-minute stage production using Alexanderson TV system

Sound added to motion pictures; the "talkies" are born

First experimental TV station permits issued by federal government

First successful trial of video delivery through telephone lines; motion pictures sent from Chicago to New York by AT&T

1929 Zworkin demonstrates all-electronic TV system; Zworkin joins RCA

The Nineteen Thirties

1930 Farnsworth receives patent for Image Dissector pickup device
 RKO experiments with theater television in Schenectady, NY
1931 AEG engineers begin work on Magnetophone recorder
 CBS conducts experimental TV broadcasts
 Blattnerphone steel band recorder used by the BBC
1932 Langmuir conducts research on the physics of gaseous discharges, improving the vacuum tube
 NBC begins experimental telecasts
 Schroeter describes method for recording pictures on magnetic tape
1933 Armstrong demonstrates FM transmission to RCA
 NBC Red and Blue radio networks move into 30 Rockefeller Center studios
 First TV broadcast from an educational institution (W9XK, State University of Iowa)
1934 FCC established as a permanent regulatory agency
 AEG demonstrates Magnetophone at annual German Radio Fair
 WLW-AM begins super power operation at 500kW
 Mutual Broadcasting System founded
 Orthicon camera tube developed
1935 Armstrong begins 50kW experimental FM station at Alpine, NJ
 Iconoscope camera developed using improved pickup device
 RCA chief Sarnoff announces a \$1 million TV research program
 First TV broadcasts in Germany and England
 I. G. Farben (BASF) makes tape with iron oxide powder on a plastic film
 AEG-Telefunken produces the Magnetophone tape recorder
1937 CBS announces TV development program
1938 Marzocci files patent application for rotary head audio recorder
1939 GE demonstrates FM for mobile communications
 GE inaugurates FM broadcasting in Schenectady, NY
 WLW-AM loses its experimental license and is ordered to return to 50kW operation
 Volume Unit (VU) meter adopted as industry standard of program level measurement
 The principles of ac bias recording developed
 Image Iconoscope developed
 TV demonstrations held at World's Fair in New York and Golden Gate International Exhibition in San Francisco
 Roosevelt becomes first U.S. president to give a speech on television
 DuMont company begins producing television sets for consumers
 First baseball game ever televised, the Princeton/Columbia contest, covered by NBC at Baker Field, NY
 First television sets offered for sale in U.S. by RCA, GE, DuMont, Philco, and two other companies

The Nineteen Forties

1940 Paramount puts first TV station on the air in Chicago

- 1941 Magnetophone goes into regular service on German radio stations
FCC authorizes commercial TV stations
- 1942 Digital computer conceived
Sarnoff awarded the rank of Brigadier General
- 1943 Nobel buys NBC Blue Network and forms the American Broadcasting Company
Image Orthicon developed
- 1945 Orr and Mullin bring German magnetic tape technology back from Europe
FM broadcast band moved to 88-108MHz
Clarke suggests geosynchronous satellites for communications
- 1946 Mullin demonstrates German Magnetophone at San Francisco IRE meeting
DuMont Network founded
Zoomar introduces first professional zoom lens
Tokyo Tushin Kogyo founded; name changed to Sony in 1955
- 1947 First taped US radio network program airs, featuring Bing Crosby
3M introduces Scotch 100 audio tape
Transistor effect demonstrated at Bell Labs
First Hollywood film production for TV, *The Public Prosecutor*.
- 1948 ABC begins regular use of Ampex model 200 audio tape machine
- 1949 Liberty Broadcasting System founded
-

The Nineteen Fifties

- 1950 FCC approves CBS whirling disc color system
Rectangular kinescope developed
Vidicon developed
Installation of first CATV system begins
Tricolor kinescope developed
Mullin begins work on video recorder for Crosby Enterprises
Stereo tape recorder, Magnecord 1250, introduced
- 1952 FCC approves UHF-TV broadcasting
Ampex VTR team reproduces barely recognizable picture from tape
Crosby Enterprises demonstrates VTR with fixed heads and high tape speed
Axton (England) begins work on VERA video recorder project
Theater television reaches its peak with the broadcast of the Walcott/Marciano fight
- 1953 Wireless microphone demonstrated
AM transmitter remote control authorized by FCC
405-line color system developed by CBS with "crispening circuits" to improve apparent picture resolution
FCC reverses its decision to approve the CBS color system, deciding instead to authorize use of the color-compatible system developed by NTSC
Color TV broadcasting begins
RCA demonstrates its longitudinal video recorder
Toshiba begins work on helical scan video recorder
RCA develops shadow-mask color CRT

ABC merges with Paramount

1955 First FM picture off tape accomplished by Ampex VTR team

Experimental 1/2-inch videotape system is displayed in closed-circuit telecast from New York to St. Paul, MN

RCA prototype videotape machine used briefly on air at NBC

RCA demonstrates prototype single-tube color camera

Paramount Pictures develops forerunner of Sony Trinitron CRT

1956 First VTR demonstrated by Ampex at National Association of Radio and Television Broadcasters (hereafter referred to as NAB), using un-tested experimental 3M 2-inch videotape

Broadcast-quality solid-state camera (except for pickup tube) developed

Black-and-white portable TV era begins

Computer hard disk introduced

1957 Laser developed

2-inch quad VTR makes its network debut on CBS

RCA introduces the TRT-1A quad VTR

Radio-Electronics-Television Manufacturers Association changes name to Electronic Industries Association (EIA)

1958 Ampex demonstrates color VTR

1959 *Broadcast Engineering* magazine founded

National Stereophonic Radio Committee formed to decide on an FM stereo system

Audio cartridge recording system introduced at NAB by Collins Radio

Broadcast Electronics introduces Spotmaster cart machine

Ampex VTR at Moscow trade fair records the Nixon/Khrushchev "Kitchen Debate."

The Nineteen Sixties

1960 Stereo FM tests conducted over KDKA-FM, Pittsburgh

Ampex introduces Intersync system for VTR

Toshiba proposes a videotape recorder using a helical scanning process

Echo I and II passive reflector satellites launched

First rectangular screen TV introduced

First battery-operated transistorized TV for sale

1961 FM stereo transmission system approved by FCC

Electron beam recording demonstrated

Ampex SloMo Disc developed

First live televised presidential news conference (John Kennedy)

First Western viewing of live television from USSR on the BBC (Moscow welcome for Yuri Gagarin)

1962 FCC issues FM licensing reallocation rules

Philips introduces audio cassette tape player

Telstar communications satellite provides first international relay of TV pictures

Legislation passed in U.S. creating Comsat

Legislation passed requiring all-channel tuning (UHF and VHF) in television receivers

RCA announces first fully transistorized video recorder

1963 RCA develops metal oxide semiconductor (MOS) process

FCC issues new FM table of assignments

FCC releases new FM table of assignments
 TV transmitter remote control authorized by FCC
 ITFS service established by the FCC
 Electronic line-store (625-405 and 405-625) standards converter developed by the BBC
 TV used on a U.S. manned space flight, the Mercury 9
1964 RCA develops complementary MOS (CMOS) technology
 Society of Broadcast Engineers holds first official meeting at NAB in Chicago
 Intelsat organization formed
 Character generator system introduced
 RCA videotape cartridge developed
 First TV program automation system installed
 TV camera placed on board Ranger 7 explorer to moon
 TEAC provides slow-motion color video playback system for NHK coverage of 1964 Olympics
 Industry committee formed to establish videotape standards, with SMPTE as secretariat
1965 "Early Bird," first international communications satellite, launched (Intelsat I)
1966 First bipolar IC amplifier introduced
1967 PAL/SECAM standards announced
 First high-band color disc recorder for playback of short program segments in normal, slow or stop action is used on ABC-TV coverage of the *World Series of Skiing*
 First timecode editing system for video, called On-Time, is developed by CBS, Hollywood
 Solid state imaging technology demonstrated
 Intelsat II satellite launched
1968 CBS uses a portable minicam for political convention coverage
 Trinitron tube developed
 1-inch Plumbicon developed
 First radio/TV business automation systems installed
1969 Instant random-access audio cartridge machine introduced at NAB by IGM Communications
 SMPTE timecode established to end the chaos of incompatible time codes for various editing machines
 Neil Armstrong walks on the moon (July 21); worldwide audience watches the event live

The Nineteen Seventies

1970 PBS network established
Color-under recording used in first 3/4-inch VTR from Matsushita, Victor Company of Japan and Sony
 ACR-25 random access video cassette recorder introduced by Ampex
1971 U Format introduced by Sony/TEAC and JVC
 CMX formed after a joint experiment between CBS and Memorex
 NHK (Japan) begins experiments with high line number TV systems, and discusses the feasibility of an 1125-line system
 RCA joins EECO to develop and market the TCE-1000, an electronic editing system based on timecode
 Cinema Products CP-16 news film camera introduced
 Electronic tuning first seen in U.S. TVs
1972 Teletext experiments begin in United Kingdom
 Time base corrector introduced by Consolidated Video Systems

BBC develops "sound-in-sync" digital encoding system for audio-video combining

CMX 300, the first computerized editing system, is introduced for on-line editing and auto assemble of pre-edited shows

Adapted Sony camera and 3/4-inch U-matic VTR used for roving reports at the national political conventions

MCA gives first public demonstration of laser videodisk

First prerecorded videocassette tapes offered to consumers

1973 A Format 1-inch VTR shown by Ampex

First ENG cameras used in electronic field production

First multi-point distribution (MDS) microwave system launched

Giant-screen projection color TVs marketed

1974 First microprocessor used in broadcast equipment

2/3-inch Plumbicon developed

Frame reducer/recorder introduced

Sony introduces Betamax home VCR

1975 B Format 1-inch VTR shown by Bosch

Study group begins work on a digital video world standard

HBO begins program distribution via satellite

1976 Sony shows 1-inch VTR at NAB in Chicago

Ampex shows VPR-1 helical recorder with automatic scan tracking; also introduces a portable model, the VPR-10

World's first digital PAL TV transmission via satellite (Intelsat IV)

Ampex shows first electronic still store system, the ESS

VHS home recording format introduced

1977 PBS begins operation by satellite

TEAC introduces PCM digital audio disk recorder

Type C format VTRs introduced

Last tower of historic Radio Central, Rocky Point, NY, is destroyed

1978 Teletext experiments begin at KSL-TV in Salt Lake City

NHK experiments with HDTV via satellite relay

NHK begins multiple audio channel television in Tokyo

Fiber-optic technology demonstrated

Digital VTR demonstrated

1979 Mutual Radio Network and National Public Radio begin operation by satellite (analog)

B format and C format for VTRs accepted by SMPTE and ANSI

B format and C format portable VTRs with battery power shown

CCD telecine introduced by Bosch (FDL-60)

The Nineteen Eighties

1980 First of second generation type C machines introduced

1981 Beta Format introduced by Sony

M Format introduced (Matsushita, Panasonic, RCA and Ikegami)

First space shuttle launched

1/2-inch Plumbicon (Phillips) and Saticon (NHK) introduced
HDTV demonstrated in United States at SMPTE in Los Angeles
Digital video sampling frequency selected as 13.5MHz for worldwide use
ZDF, Rohde & Schwarz, and Siemens introduce multiple audio channel television in Berlin
TEAC develops optical laser write/read disc system
Ampex introduces ADO digital video processor
First camera/recorder ENG systems shown at NAB
Ampex and Dynamics Control show all-digital studio cameras
1982 FCC issues the "marketplace" decision on AM stereo
Low power TV service established by the FCC
First LPTV station begins operation in Bemidji, MN
Quantel Mirage introduced at NAB
NEC DVE effects system introduced at NAB
Bosch shows first 1/4-inch camera/recorder, the KBF-1 in prototype form
CMX/Orrox shows a disc-based editing system
Two HDTV systems are shown at IBC in Brighton (Sony and Philips). Two other systems are proposed for Germany and England using a doubled 625-line PAL signal
1983 Network radio distribution by satellite (ABC, CBS, NBC and RKO) using digital format
Digital TV receiver shown by ITT-Intermetall in Germany
Multiple audio channel TV system selected by EIA for U.S
Ku-Band satellite transmission for broadcast tested by NAB and during space shuttle launch
FCC issues 80-90 decision on FM radio
Use of FM subcarriers deregulated by FCC
First long-distance inter-city digital TV transmission sent via fiber optic cable
NEC introduces the SPC-3 CCD camera
1984 RCA introduces CCD-1 solid-state camera at NAB
Varian/EIMAC introduces Klystron tube as a product
FCC approves use of AM subcarriers for broadcast and non-broadcast functions
FCC eliminates programming guidelines, ascertainment, commercial rules and program logging requirements for commercial TV stations
FCC replaces the 7 station ownership rule with 12 station limits
Montage Picture Processor introduced by Montage Computer Systems
Lucasfilm/Convergence shows the Editdroid disk-based editing system designed to emulate film style editing
Multi-channel TV sound broadcast authorized by FCC; first stereo TV broadcasts begin. Sales of stereo color TV receivers and adapters begin
First color TVs with all-digital signal circuitry marketed
1985 FCC adopts RF radiation protection standards for human exposure
Panasonic introduces M-II format at NAB convention
Natuell introduces first totally solid state 50kW AM transmitter
U.S. Court of Appeals rules the FCC's "must-carry" rules regarding cable television are unconstitutional
FCC inquiry into "fairness doctrine" concludes the policy no longer serves the public interest
SMPTE working group on digital TV tape recording votes approval of the D-1 component digital format
The National Radio Systems Committee (NRSC) begins to study proposals for a standardized AM transmission pre-emphasis curve

Data transmission on vertical blanking interval authorized by FCC
Harris signs licensing agreement with rival Motorola on AM stereo transmission standard
CCIR approves D-1 digital component recording format for worldwide program exchange
Color TVs with 35-inch picture tubes marketed
1986 Sony introduces DVR-1000 digital videotape recorder based on CCIR 601 (D-1) standard
Ampex shows ACR-225 prototype composite digital cartridge VTR
Ampex, Thomson and Bosch sign manufacturing and marketing agreements with Sony to produce Betacam products
NBC announces purchase of M-II products from Panasonic
SMPTE forms ad hoc group on high definition studio systems to document specifications for 1125/60 HDTV
Ampex submits its composite digital format (D-2) to SMPTE for standardization
Scrambling of satellite-fed cable TV programming starts; sale of decoders and program subscriptions to home dish owners begins
Stereo-sound in television broadcasting available in all major U.S. population centers
1987 Super-channel DBS service begins in the U.K
Abekas introduces the A-64 digital disk CCIR 601 recorder
NEC introduces SR-10 solid state video recorder
Dolby introduces SR noise reduction system
Advanced Television Systems Committee announces plans to conduct over-the-air tests of HDTV transmission formats
FCC issues a Notice of Inquiry to determine the status of advanced TV systems
Enforcement of the "fairness doctrine" ends
SMPTE working group on HDTV approves 1125/60 standards document
NRSC announces voluntary standards to reduce AM band interference
NAB forms HDTV technology center to study future of television
Super VHS (S-VHS) introduced
1988 FCC refuses to reconsider marketplace decision on AM stereo
NRSC issues second voluntary national standard (NRSC-2) for AM radio
Ampex and Sony introduce D-2 digital composite tape machines
Harris introduces DX-25 digital solid state AM transmitter
First Klystron-equipped 60kW UHF transmitter goes on the air in Wrens, GA
FCC rules that advanced television systems designed to deliver improved pictures to consumers must be compatible with existing NTSC receivers
Europe's Eureka 95 HDTV system demonstrated at IBC in Brighton, England
NBC proposes a 1050/59.94 HDTV system with the backing of ABC, Zenith, Thomson Consumer Electronics, North American Philips and others
Philips laboratories demonstrates its HDTV system designed for satellite transmission (HDS-NA)
Advanced Television Test Center announces plans to begin over-the-air tests of proposed advanced and high definition TV systems
First improved definition television (IDTV) receivers marketed
1989 American National Standards Institute (ANSI) gives final approval to 1125/60 HDTV production standard
Varian/TVT announces plans to install multi-stage depressed collector (MSDC) klystron transmitter

The Nineteen Nineties

1990 Production of giant-screen (over 27-inch) color TV picture tubes starts in U.S

Legislation requiring close captioning decoders in all larger color TVs manufactured after July 1, 1993 signed into law

All-digital high-definition television (HDTV) system proposed; FCC sets testing schedule

1991 First TVs with built-in closed-caption display capability introduced in U.S

U.S. testing of HDTV systems begins

1993 16:9 aspect ratio (widescreen) television sets marketed in U.S.

1995 First television program (*Computer Chronicles*) delivered via the Internet

First television station (KOLD 13) uses a networked digital video server in its daily on-air operations

Interactive cable modem trials with consumers started

Flat-screen plasma display TVs introduced

1996 First TV sets equipped with VCR Plus+ introduced in U.S

HDTV is broadcast and received live at test station WHD-TV in Washington, D.C

Set-top boxes plug into TV and telephone and allow viewers to surf the Internet's World Wide Web via remote control

Zenith introduces the U.S. market's first HDTV-compatible front projection TV

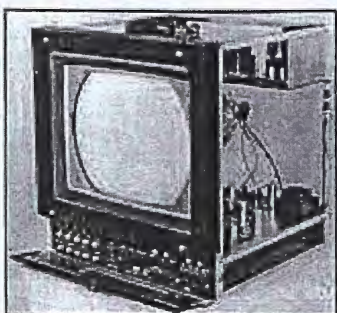
Agreement between broadcasters, TV manufacturers, and PC makers sets inter-industry standard for digital HDTV

1997 FCC assigns digital spectrum to broadcasters and sets schedule for digital broadcasts

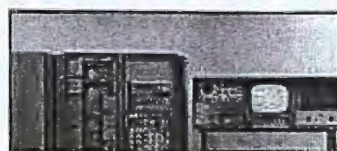
Historical Photos



Studio source and control equipment has changed dramatically within the last 30 years. Audio control boards and video switchers have become more compact, versatile and user-friendly. Shown is a 1959 model Gates Radio Gatesway audio board. (Courtesy of Harris.)



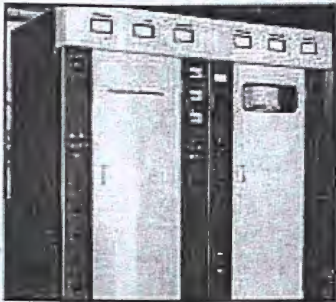
Video monitoring equipment has undergone immense changes during the past 50 years. The large (and heavy) picture monitors of the late '50s and early '60s used vacuum tubes by the dozen. Today's monitors are smaller, easier to use, more stable and offer more features than engineers could have imagined in the early days of television. Solid-state and digital technologies have made these advances possible. Shown is a Conrac CF-21 color monitor available in 1959. (Courtesy of Conrac.)



It is hard to overestimate the effect that videotape recording technology has had on the broadcast industry. By 1959, Ampex and RCA were producing the fruits of their 1957-58 technology exchange -- RCA's color knowledge for



Ampex's spinning head and FM signal processing technology. Ampex introduced *Intersync* with the VR-1000B in 1959 and the *10-10 color kit*. VTRs of today offer features and flexibility thought impossible only a few years ago. (Courtesy of Ampex.)



Dramatic improvements have been made over the years in AM transmitter efficiency. New technology transmitters run cooler, quieter and often can switch around a problem stage on their own. Shown is a 1960s vintage Continental 10kW AM transmitter, which used 6 vacuum tubes. (Courtesy of Continental.)

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TV Broadcasting History - Various Articles

Picture Transmission and Television (1928)

This is taken from the article "Radio Telegraphy and Telephony" in the 1929 World Almanac. The article was prepared by the information department of the American Telephone and Telegraph Company.

Since signals for the transmission of pictures or of television may be sent by either radio or wire, these matters are not restricted to the radio field. In this account of the development of the radio art, it therefore seems appropriate to describe chiefly those systems which have been demonstrated or are now in use, employing radio channels.

The "Photoradio" process used by the Radio Corporation of America for the facsimile transmission of material employs at the transmitting station a scanning process which effectively transforms the picture from a half-tone into a black and white dotted picture. In this way signals are transmitted at frequent intervals instead of continuously and the effects of the variable ether path are partly obviated. At the receiving end, chemically treated paper is darkened by the action of a jet of hot air under the control of the incoming signals. This process requires about one hour for the transmission of a picture and during 1928 continued in operation across the Atlantic between New York and London, and across the Pacific between San Francisco and Honolulu.

The transmission of weather maps by the U. S. Navy has continued using the apparatus developed by C. Francis Jenkins. This is a system by which weather maps are sent from Washington to some of the ships of the Navy at considerable distances.

The broadcasting of pictures by a few regular radio broadcasting stations, using frequencies in the broadcast band, has continued during the year 1928. Considerable interest in the reception of these pictures has been manifested by technically-minded listeners.

The most striking development in electrical communication within the last two years has undoubtedly been television. This was accomplished both by wire and by radio at the initial demonstration by the Bell System on April 7, 1927. The radio demonstration at that time consisted of the transmission of television signals from Whippany, N. J., 22 miles from New York, to the Bell Laboratories building in New York City where the speakers and performers were readily recognized on the receiving screen. The voices of the persons at Whippany were transmitted, and reproduced by means of a loud speaker.

At two demonstrations during 1928 the Bell Laboratories showed improvements in the television apparatus, the first consisting of the use of crystals for controlling the frequency of the transmitting and receiving apparatus, thus eliminating the necessity for the transmission of synchronizing current. The second demonstration was of the transmission of a scene in the open air, illuminated by ordinary sunlight.

The General Electric Company has also been active in this field and has demonstrated television upon a screen such as one would use for a home motion picture projector. Other parties, notably C. Francis Jenkins of Washington, have been active in television or the related field of picture transmission.

Various workers in Europe have also been engaged in the study of optical transmissions by

electricity. Baird in England has used both visible and infra-red light and is also reported to have demonstrated the reproduction of television images in color. In Germany, Karolus has perfected a cell through which light passes in variable amounts under the control of an electric field. This furnishes a rapid method of varying an intense beam of light. In France, Belin has also conducted investigations on optical transmissions, using the cathode ray oscillograph.

On account of the great popular interest in television, it should be explained that the apparatus required is rather elaborate and that even under laboratory conditions the art has not yet come to near the stage of development required to reproduce scenes with the fineness of detail of the regular motion picture.

New York Times, Sept. 23, 1945

Television station WABD discontinued its programs after its sign-off last Thursday night and will not be back on the air until Dec. 15. In the interval the station will shift from channel 4 (78 to 84 megacycles) to its newly assigned channel 5 (76 to 82 megacycles), a position in the spectrum not heretofore assigned to the New York area.

During the interim period between telecasts, DuMont engineers are making arrangements to assist set owners in modifying their receivers to receive programs on the new band.

Rules and Regulations Governing Visual Broadcasting

Feb. 18, 1929

The Federal Radio Commission has adopted the following rules and regulations governing visual broadcasting:

That visual broadcasting be designated to include both television broadcasting and picture broadcasting, or moving-picture broadcasting and still-picture broadcasting, and that all licenses issued to be of an experimental nature for a period of six months only, the licensees to report to the commission the results of their experiments; the transmitters to be located outside the city limits and sufficiently distant from important receiving centers to avoid interference.

For joint use to visual broadcasting licensees the commission authorizes the following bands of frequencies for experimental use only; 2,000 to 2,200 and 2,750 to 2,950 kilocycles. In addition, the commission will authorize the operation of visual radio broadcasting transmitters in the band between 2,200 and 2,300 kilocycles, on the condition that they do not interfere in any way whatever with the services of any other nation on the North American Continent and in the West Indies, and that licenses be subject to revocation in case there are any complaints from any other nations of any such interference. The commission may continue to issue experimental television or visual licenses in the broadcast band for operation between 1 and 6 a.m. only, in accordance with General Order 50.

The commission adopted the following rules of priority in the granting of applications:

1. Those engaged in experimentation to improve the technique of visual broadcasting.
2. Those who employ methods which give the maximum definition with the minimum radio frequency band widths.

Book Excerpt

The following is excerpted from The Radio Manual (for Radio Engineers, Inspectors, Students, Operators and Radio Fans), Second Edition, September, 1929, by George E. Sterling (Radio Inspector, Radio Division, U. S. Department of Commerce), published by D. Van Nostrand Company, New York.

2. Early Developments -- In June, 1925, Mr. C. Francis Jenkins gave the first public demonstration of the transmission of images of living subjects, and also of film records of persons and scenes. Mr. Jenkins effected his transmission by radio and in the latter case called his images of living subjects "radio vision," and his transmission of films "radio movies." In April, 1927, the American Telephone and Telegraph Company transmitted images of living persons from Washington to New York over telephone circuits. The same sort of images were also transmitted by radio from the A. T. & T. experimental station at Whippany, N. J. to the laboratories in New York City. In the considerable publicity given to the A. T. & T. transmissions the term "television" was used, and has largely been adopted by the general public as applying to any form of visual broadcasting. One cannot well quarrel with established usage, even though incorrect, but a discrimination should be made between the radio transmission of living subjects and transmission of film records of such subjects. Therefore in this chapter we will call the first system "television" (meaning radio vision, although the term does not say so) and the second one "radio movies."

Now observe that in the A. T. & T. demonstrations wire and radio channels were used interchangeably. Thus the art of seeing at a distance is not necessarily a radio art and the reason for introducing it into a radio book lies in the expectation that some form of it will see wide distribution as an auxiliary to the present (acoustic) radio broadcasting. Independent wire development for public entertainment can be expected.

3.) Radiomovies -- Radiomovies are made possible by first photographing the subject with an ordinary motion picture camera. The problem then becomes that of transforming the lights and shadows of this film into electrical impulses which can be transmitted and at the receiving end reconverted into lights and shadows properly distributed on the receiving screen. Since in the ordinary moving picture theatre a flickerless picture necessitates running the film through the projector at the rate of about 16 pictures per second, we must carry out our process of conversion at this same rate, which is to say, we must in 1/16 of 1 second completely transform one "frame" or picture into electrical impulses and move it on so that the next "frame" may be similarly analysed in the next 1/16 of 1 second. The process of doing this is basically the same one of "scanning line-for-line" as is used in transmitting directly the image of a living person. However, the small size of the film permits some surprising simplifications and economies of the apparatus and without doubt the greatest accomplishments have been made along the line of transmitting and receiving silhouette and half-tone radiomovies. As transmitted from the Jenkins station W3XK, these have been well received over a considerable portion of the United States.

The first radiomovies transmitted from the Jenkins Laboratories were only silhouettes in order to confine the frequency...

29. Rules and Regulations of the Federal Radio Commission governing the Operation of Visual Broadcasting -- That visual broadcasting be designated to include both television broadcasting and picture broadcasting, or moving picture broadcasting and still picture broadcasting, and that all licenses issued be of an experimental for a period of six months only, the licensees to report to the Commission the results of their experiments; the transmitters to be located outside of the city limits and sufficiently distant from local programming centers to avoid interference.

For joint use to visual broadcasting licensees, the Commission authorized the following bands of frequencies for experimental use only: 2000 to 2200 and 2750 to 2950 kilocycles, on the condition that they do not interfere in any way whatever with the services of any other nation on the North American Continent or in the West Indies, and that licenses be subject to revocation in case there are any complaints from any other nation of any such interference. The Commission may continue to issue experimental television or visual licenses in the broadcast band for operation between 1 and 6 a. m. only, in accordance with Central Order 50.

The Commission adopted the following rules of priority in the granting of applications:

1. Those engaged in experimentation to improve the technique of visual broadcasting.
2. Those who employ methods which give the maximum definition with the minimum radio frequency bandwidths.

LIST OF VISUAL BROADCASTING (TELEVISION) STATIONS

CALL	LOCATION	LICENSEE	FREQUENCY	POWER
W1XAE	624 Page Blvd., E. Springfield, MA	Westinghouse Elect. & Mfg.	2.0 - 2.1	20.0
W1XAY	Adams Street, Lexington, MA	J. Smith Dodge	4.8 - 4.9	0.5
W1XB	63 Gorham Street, Somerville, MA	General Industries	2.1 - 2.2, 2.75- 2.85	0.5
W2XBA	Newark, NJ	WAAM, Inc.	2.75 - 2.85	0.05
W2XBS	70 van Cortland Pk. S., New York, NY (portable)	Radio Corporation of America	2.0 - 2.1	5.0
W2XBU	Beacon, NY	Harold E. Smith	4.8 - 4.9	0.1
W2XBV	New York, NY (portable)	Radio Corporation of America	2.0 - 2.1	5.0
W2XBW	Initial location: 70 River Road, Bound Brook, NJ (portable)	Radio Corporation of America	2.0 - 2.1	5.0
W2XCL	323 Berry Street, Brooklyn, NY	Pilot Electric Mfg. Co.	2.0 - 2.1, 2.75 - 2.85	0.25
W2XCO	New York, NY (near)	Radio Corporation of America	2.1 - 2.2	5.0
W2XCR	346-70 Claremont St., Jersey City, NJ	Jenkins Television Corp.	2.1 - 2.2	5.0
W2XCW	1 River Road, Schenectady, NY	General Electric Company	2.1 - 2.2	20.0
W2XR	140 Nassau Street, New York, NY	John V. L. Hogan	2.0 - 2.1, 2.1 - 2.2	0.5
W2XX	Overton Road, Ossining, NY	Robert F. Gowen	2.0 - 2.1	0.1
W3XK	1519 Connecticut Ave., Washington, DC	Jenkins Laboratories	2.0 - 2.1, 2.85 - 2.95	5.0

W3XL	River Road, Bound Brook, NJ	RCA Communications	2.85 - 2.95	30.0
W4XE	Winter Park, FL	William J. Lee	2.0 - 2.1	2.0
W6XAM	Washington & Oak Sts., Los Angeles, CA	Ben S. McGlashan	2.0 - 2.1	0.5
W6XC	5155 S. Grammercy Place, Los Angeles, CA	Robert B. Parrish	4.5 - 4.6	15.0
W7XAO	Portland, OR	Wilbur Jerman	2.75 - 2.85	0.1
W8XAV	E. Pittsburgh, PA	Westinghouse Elect. & Mfg.	2.0 - 2.1, 2.1 - 2.2, 2.75 - 2.85	20.0
W9XAA	Foot of Grand Avenue, Chicago, IL	Chicago Federation of Labor	2.0 - 2.1	1.0
W9XAG	1768 Wilson Avenue, Chicago, IL	Aero Products, Inc.	2.0 - 2.1	1.0
W9XAO	6312 Broadway, Chicago, IL	Nelson Bros. Bond & Mortgage	2.0 - 2.1	0.5
W9XAZ	Iowa City, IA	University of Iowa	2.0 - 2.1	0.5
WRNY	Hudson Terrace, Coytesville, NJ (1 to 6 am only)	Aviation Radio Station, Inc.	1010 kc.	0.25

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1935-1960

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1935-1941 Timeline

1935

- Patent interference between Zworykin and Farnsworth ruled in favor of Farnsworth. Prevents RCA from gaining total patent control of television.
- Sarnoff evicts Armstrong from the Empire State building and announces million dollar research and testing plans for television.
- March - Germany begins what they call the "first television broadcasting service in the world". Low resolution, few receivers.

1936

- April - First RCA demonstration in 4 years of all-electronic system, 343 lines, 30 frames per second.
- Farnsworth also broadcasting 343-30 at Wyndmoor, Pennsylvania station.
- Summer -- Berlin Olympics televised by Telefunken and Fernseh, using RCA and Farnsworth equipment, respectively.
- Fall -- Farnsworths travel to England to help Baird in his competition with EMI.

■ November 2 -- BBC begins two-year Baird-EMI competition, broadcasting from Alexandra Palace. It is hailed as the "world's first, *public*, regular, high-definition TV station".

■ November 30 -- Fire destroys Baird labs at Crystal Palace

1937

■ February -- BBC declares EMI the victor in competition.

■ The coronation of King George VI and the Wimbledon tennis tournament are televised in England. Nine thousand sets are sold in London.

■ France orders the world's most powerful transmitter to be constructed in the Eiffel Tower.

■ 18 Experimental Television Stations are operating in the United States.

1938

■ June -- RCA announces the *Image* Iconoscope, a camera tube that is almost ten times more sensitive to light than the earlier Iconoscope.

■ October -- Sarnoff announces that RCA will begin regular broadcasting at the World's Fair

1939

■ March 31 -- Farnsworth begins operations at Fort Wayne, Indiana

■ April 20 -- Sarnoff announces from the New York World's Fair that "Now we have added sight to

sound". Ten days later, at the opening ceremonies, FDR is the first president to be televised, TV sets go on sale the following day. **Click [here](#) for a listing of television stations operating in the United States.**

- Approximately twenty-thousand electronic sets operating in England.

- 1 September 1939 -- UK-television transmissions switched off due to imminent outbreak of war.

- October 2 -- Farnsworth signs patent-licensing agreement with RCA. This is the first time that RCA has ever agreed to pay royalties to another company, since it is founded in 1919.

1940

- FCC announced September 1st start date for commercial television, but canceled that decision when RCA began advertising early.
- FCC formed a special committee, called the NTSC (National Television Standards Committee), to decide on industry standards. There were 23 experimental television broadcasting stations operating in the United States.
- JUNE: Both RCA and Philco televised the Republican convention, held in Philadelphia
- AUGUST: A young (33) Peter Goldmark announced to the NTSC that CBS had marketable color television.

1941

- MARCH: The NTSC announced the recommended USA standard of 525 lines and 30 fps (frames per second). FCC announced that commercial broadcasting could begin July 1st.
- JULY 1st: NBC was the first with commercially sponsored broadcasts -- then, CBS, DuMont and others followed in the Fall
- DECEMBER 7th: Pearl Harbor

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1950-1959 Timeline

This page is a timeline of important dates and events that occurred in the 1950-1959 time period.

1950

- CBS presents color television system using a spinning mechanical color wheel. In October, the FCC approves CBS color for commercial broadcasting. Sarnoff orders his "holy crusade" at RCA to perfect electronic color television. Click [here](#) for the company booklet issued in December 1950, telling about the success of their intense efforts.

1951

- June 25th: CBS broadcasts a one-hour Ed Sullivan show, but only two dozen CBS sets can receive the color broadcast. By the end of June, RCA demonstrates its electronic color system, and the industry takes notice.
- October: All color TV production is suspended for the duration of the Korean conflict.
- December 6th: [Code of Practices for Television Broadcasters](#) is adopted for USA. Also known as the "Seal of Good Practice".

1953

- March 25th: CBS gives victory to RCA in color war.
- December 17th: FCC approves electronic RCA color system, reversing its prior decision to accept CBS mechanical system. It calls this new RCA color system "NTSC" color.

1954

- RCA places its first all-electronic color set on the market, early in the year, the CTC-100, with a 12-1/2" screen, for \$1,000. Sales were predicted to be 75,000 units -- however, only a **reported** 5,000 were sold. Current belief is that the real number is closer to 1,000 sets sold to the public. Many sets were donated to schools and also sold at a discount to employees.

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1946-1949 Timeline

This section provides a chronological timeline of television-related events.

1946

- CBS gave the FCC a demonstration of their mechanical color system. Viewers were impressed.
- J. Logie Baird, Scottish television pioneer, dies.
- Post war production of American TV sets begins



1946 7" Viewtone - Truly the first post war American television (utilizing a pre-war design), marketed as a 1946 model, but sold in very small quantities starting in August 1945. The selling price was \$100, quite an affordable set at the time. The president of Viewtone, Mr. Irving Kane, wanted to tap into the post war television market as quickly as possible, and also wanted to offer a set that people could afford. The photograph at the left was taken in August 1945. Eventually four different models were sold, all using Du Mont picture tubes. The company went out of business in August 1947. There are no known examples of the set shown in the photograph.



1946 7" RCA 621TS - RCA *announced* both the 621TS (and the 630TS below) to the American public on October 7th 1946. RCA then had a five city (newspaper) advertising campaign for both sets, with sales beginning in November 1946.

The cabinet of the 621TS (offered in mahogany, walnut and blonde wood) was designed in the pre-war period by John Vassos, however the chassis was a post-war design. Initial price was \$226.40. The 621 was on the market very briefly and was quickly outsold by the 630TS with a 10" screen (see below). Production was 17,000 units - not many have survived until today - the set is popular among collectors.



1946 10" RCA Model 630TS - Initial selling price was \$352.00. It weighed 95 lbs., and was on the market from 1946 until 1949. Many other manufacturers bought the 630 chassis, and had their own cabinets made. Even in 1950, the set was offered in kit form and a hobbyist could build a do-it-yourself TV set. Approximately 43,000 were sold the first year and hundreds-of-thousands continued to be sold in later

years. Collectors call this the Model-T of television, and it is the first set completely designed and marketed post war.

1947

- RCA flooded the market with black & white sets to slow the potential launch of CBS color. An adapter (about \$100) would have to be installed to all non-CBS color sets. The FCC ruled CBS color is 'premature'.

1948

- Pye Television, a UK firm, set up a demonstration at the Australian "Royal Easter Show", held in Sydney, six years ahead of the first public broadcasts. Read the full story below:



(144K)

1949

- Facing the challenge head-on, Sarnoff ordered stepped-up development of an all-electronic RCA color system. Perfected system is ready by December 1950.
- Farnsworth Radio and Television is sold to ITT. Philo Farnsworth, at age 43, suffering from alcoholism, was no longer a part of the television industry.


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1942-1945 Timeline

This section provides a chronological timeline of television-related events.

1942-1945

- All commercial production of television equipment is banned for the rest of the war. NBC's commercial TV schedule is cancelled. Limited broadcasting does continue, however, throughout the war years, in a few cities, for a few hours per week.


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-

A U. S. Television Chronology, 1875-1970

Channels listed in program section

NEW YORK CITY		ZONE			
②	WCBS-TV (CBS)	485 Madison Ave.,	22.	⑪ WPIX (Ind.) 220 East 42 St., 17.	
④	WRCA-TV (NBC)	30 Rockefeller Pl.,	20.	⑬ WATV (Ind.) Empire State Bldg., 1.	
⑤	WABD (Du Mont)	205 East 67th St.,	21.	CONNECTICUT	
⑦	WABC-TV (ABC)	7 West 66th St.,	23.	⑧ WNHC-TV (ABC, CBS, Du Mont)	1110 Chapel St., New Haven, 10.
⑨	WOR-TV (Ind.)	1440 Broadway,	18.	⑬ WICC-TV (ABC, Du Mont)	Booth Hill Road, Trumbull (Bridgeport)

Advertising: 10 Rockefeller Plaza, New York 20; JUDSON 6-4300. **Editorial:** 30 Rockefeller Plaza, New York 20; Circle 6-4488. **Subscription:** Box 8019, Phila. 1, Pa.

The channel line-up in the New York Metropolitan edition of *TV Guide*, Nov. 12, 1955.

This timeline of U. S. television broadcasting history is a work in progress. If you can suggest any improvements in this list, please send them to Jeff Miller. The following people have contributed to this page: Donna Halper, Bob Carpenter, Joseph Gallant, Paul Lindemeyer, Wesley Orr, Dan Kallenberger, Mark Leff, Pat Dyer, Neil Nelkin, Dave Robertson, Al Robinson, Xen Scott, William V. Sutherland, John Ross, Teddy Dibble, Chuck Davis, Tom Hoehler, Bill Hepburn, Rickey Stein, and Garrett Bauer. Last revision: Dec. 29, 2002.

An asterisk indicates the sign-on date for the station. Start dates are shown for all stations on the air or with a construction permit by Sept. 30, 1948, when a freeze on new applications was imposed.

1875. George R. Carey of Boston proposes a television system in which every picture element is transmitted simultaneously, each over a separate circuit.

1880. The principle of scanning an image is proposed, by E. E. Sawyer in the U. S., Maurice Leblanc in France, and others (approximate date).

1900. The term *television* is coined by Constantin Perskyi at the International Electricity Congress, part of the 1900 Paris Exhibition (*Tube: The Invention of Television* by David E Fisher and Marshall Jon Fisher, p. 29).

1921. Charles Francis Jenkins incorporates the Jenkins Laboratories in Washington for the sole purpose of "developing radio movies to be broadcast for entertainment in the home."

May 19, 1922. Charles Francis Jenkins achieves his first successful laboratory transmission.

Oct. 3, 1922. Jenkins first public demonstration, using Navy station NOF in Anacostia. He transmitted pictures, rather than television in the modern sense. The photographs were sent by a telephone wire from his Washington office to NOF and they were then broadcast by wireless back to the Post Office in Washington.

June 14, 1923. Jenkins' first true television demonstration, using NOF. (He continued to use NOF until 1925. By 1925, the NOF transmissions were on 1875 kHz, using 48 lines.)

Dec. 29, 1923. Zworykin applies for a patent for an all-electronic television system.

June 13, 1925. Charles Francis Jenkins achieves the first synchronized transmission of pictures and sound, using 48 lines, and a mechanical system. A 10-minute film of a miniature windmill in motion is sent from Anacostia to Washington, D. C., a distance of 5 miles. The images were viewed by representatives of the Bureau of Standards, the Navy, the Commerce Department, and others. Jenkins called this "the first public demonstration of radiovision" (although Baird had publicly demonstrated a working television set at Selfridge's Department Store in London two months earlier).

1926. Orrin Dunlap, radio editor of the *New York Times*, describes television as "an inventor's will-o'-the-wisp."

Aug. 18, 1926. A weather map is televised for the first time, sent from NAA Arlington to the Weather Bureau Office in Washington.

Dec. 1926. WGY's TV station*, video 37.8 meters, sound 755 kHz

Apr. 7, 1927. An image of Commerce Secretary Hoover is transmitted in the first successful long distance demonstration of television using Bell Telephone Co. experimental station 3XN, Whippany NJ. 3XN used 1575 kHz video, 1450 kHz audio, 185 synch. AT&T had not previously announced its television research, which was being conducted by Herbert E. Ives and others.

May 23, 1927. The first demonstration of television before a large audience, about 600 members of the American Institute of Electrical Engineers and the Institute of Radio Engineers, at the Bell Telephone Building in New York.

Sept. 7, 1927. Philo T. Farnsworth demonstrates TV in San Francisco. His transmission was electronic, unlike the mechanical TV of Bell Labs, Jenkins, and others.

Jan. 13, 1928. Alexanderson demonstrates the GE system and announces the beginning of television broadcasting. The pictures were received on sets with 1.5 square inch screens in the homes of Alexanderson and two board members in Schenectady. (This is considered by some the first home reception of television in the U. S.) The picture, with 48 lines at 16 frames per second, was transmitted over 2XAF on 37.8 meters and the sound was transmitted over WGY radio station.

Feb. 25, 1928. FRC grants first TV license to Jenkins Laboratories for W3XK at 1519 Connecticut Ave. NW Washington. On air 7/2/28? 6.42 MHz, 48 lines. (In 1929 it was authorized to move the transmitter to between Silver Spring and Wheaton. The station ceased to operate on Oct. 31, 1932.)

Apr. 1928. W2XBS New York, RCA, begins in the laboratory.

May 11, 1928. The first regular schedule of TV programming is begun by General Electric in Schenectady. Programs are transmitted Tuesday, Thursday, and Friday afternoons from 1:30 to 3:30 p.m., using 24 lines.

July 1928. These stations are on the air on this date, according to John Ross: W2XBU Beacon NY (Harold E. Smith); W2XBV New York (RCA); W2XBW Bound Brook NJ (RCA); W2XAV East Pittsburgh (Westinghouse); W4XA White Haven TN; W6XC Los Angeles.

July 2, 1928. Charles F. Jenkins begins broadcasting the first regular telecasts designed to be received by the general public.

July 12, 1928. First televised tennis match.

July 21, 1928. Boston Post reports W1XAY Lexington MA has been licensed.

Aug. 13, 1928. WRNY Coytesville NJ becomes the first standard radio station to transmit a television image (the face of Mrs. John Geloso). It was a 1.5 square inch image enlarged by a magnifying glass to three inches so it could be viewed by 500 persons at Philosophy Hall at New York University. Station also operated W2XAL New York, 9.705 MHz. (WRNY broadcast sight and sound alternately rather than simultaneously. Viewers would first see the face of a performer and a few seconds later would hear the voice. The performances took place for 5 minutes every hour and were designed to lure the radio audience into buying "televisor" sets from Pilot. [Tube: The Invention of Television, by Fisher])

Aug. 22, 1928. WGY simulcasts on radio and TV (WGY, 2XAF and 2XAD) Al Smith accepting the Democratic presidential nomination. This was the first over-the-air remote pickup and the first TV news event.

Sept. 11, 1928. First play broadcast by television, "The Queen's Messenger," on W2XAD. (Sound was also broadcast over WGY radio.) Video was on 21.4 meters; sound was on 31.96 meters. The event was reported on page 1 of the *New*

York Times the next day. (During 1928, Ernest Frederik Werner Alexanderson of General Electric transmitted daily TV tests over W2XAD.)

Sept. 11, 1928. First TV signal in Buffalo, on WMAK in Kenmore

Late Oct. 1928. W1XAY* Lexington MA. (The station was licensed to J. Smith Dodge and C. F. Jenkins. J. Smith Dodge was a former engineer for WNAC and former announcer at WGI. Carl S. Wheeler was also involved in founding the station. Station basically broadcast WLEX's radio programming. The station remained on the air sporadically until the end of March 1930.)

1929. Milton Berle appears in an experimental TV broadcast. Film of the appearance survives.

1929. W2XBS (RCA) begins two-hour daily broadcasts from Van Cortlandt Park.

Mar. 27, 1929. W2XCL* Brooklyn NY (Pilot Radio and Tube Corp.) begins operating.

Mar. 30, 1929. Radio Service Bulletin lists these new stations: W9XAO Chicago IL (Nelson Brothers Bond and Mortgage Co.) 2.0-2.1 MHz, 500 watts; W2XCR Jersey City NJ (Jenkins Television Corporation) 2.1-2.2 MHz, 5000 watts; W2XCL Brooklyn NY (Pilot Electric Manufacturing Co.) 2.0-2.1, 2.75-2.85 MHz, 250 watts; W2XCO New York (RCA) 2.1-2.2 MHz, 5000 watts; W2XR New York (John V. L. Hogan), 500 watts (visual broadcasting and experimental); W2XCW Schenectady (General Electric) 2.1-2.2 MHz 20,000 watts.

April 1929. W1WX Boston begins experimental broadcasts two times a day with 100 watts. [These broadcasts continued until December, when the call was changed to W1XAV. The licensee of W1WX and W1XAV, Shortwave and Television Laboratory, Inc., was founded on 5 December 1928 by A. M. "Vic" Morgan, Hollis Baird, and Butler Perry. The company was officially dissolved on 1 January 1935, but by that time it existed only on paper, since Baird, Perry, and Morgan had all moved to General Television Corp, which they acquired on 8 March 1934. This information provided by Donna Halper, from state government records.]

Apr. 30, 1929. Radio Service Bulletin lists these new stations: W1XB Somerville MA (General Industries Co.) 500 watts (experimental and visual broadcasting).

May 11, 1929. The "first regularly scheduled TV broadcasts" begin (one source), three nights per week.

May 31, 1929. Radio Service Bulletin lists these new stations: W9XR Downers Grove IL (Great Lakes Broadcasting Co.) 2.1-2.2, 2.85-2.95 MHz, 5000 watts; W2XCP Allwood NJ (Freed-Eisemann Radio Corp.) 2.0-2.1, 2.85-2.95 MHz, 2000 watts (visual broadcasting and experimental).

June 27, 1929. First public demonstration of color TV, by H. E. Ives and his colleagues at Bell Telephone Laboratories in New York. The first images are a bouquet of roses and an American flag. A mechanical system was used to transmit 50-line color television images between New York and Washington.

July 1929. WOKO Poughkeepsie NY begins transmitting TV as W2XBUB in late July 1929.

July 31, 1929. Radio Service Bulletin lists these new stations: W9XAA Chicago (Chicago Federation of Labor), 6.08, 11.84, 17.78 MHz, 500 watts.

Aug. 31, 1929. Radio World reports WENR radio Chicago receives a license for a 5000 watt TV station (W9XR?).

Sept. 30, 1929. Radio Service Bulletin lists these new stations: W1XAV Boston (Shortwave and Television Laboratory Inc.) 2.1-2.2 MHz, 500 watts; W3XL Bound Brook NJ (RCA Communications Inc.) 2.85-2.95 MHz, 30,000 watts.

Oct. 31, 1929. Radio Service Bulletin lists these new stations: W10XU Airplane (Jenkins Laboratories), 2.0-2.1 MHz, 10 watts; W10XZ Airplane (C. Francis Jenkins), 1.608, 2.325, 3.088, 4.785, 6.335 MHz, 6 watts.

Nov. 30, 1929. Radio Service Bulletin lists these new stations: W9XAP Addison IL (Chicago Daily News), 2.75-2.85

MHz, 5000 watts.

1930. Don Lee's television station opens in Los Angeles.

Jan. 1930. W1XAV* Boston

Mar. 1930. (End of March) W1XAY Lexington MA goes off the air, leaving W1XAV temporarily as the only mechanical TV station in Boston.

Mar. 31, 1930. Radio Service Bulletin lists these new stations: W2XBO Long Island City NY (United Research Corporation), 2.0-2.1, 2.75-2.85 MHz, 5000 watts; W8XT East Pittsburgh PA (Westinghouse Electric and Manufacturing Co.), 660 kHz, 25,000 watts.

Apr. 30, 1930. Radio Service Bulletin lists these new stations: W2XAP Jersey City NJ (Jenkins Television Corporation), 2.75-2.85 MHz, 250 watts.

May 22, 1930. An audience at Proctor's Theatre in Schenectady becomes the first to see closed-circuit TV projected onto a big screen.

May 31, 1930. Radio Service Bulletin lists these new stations: W10XAL United States (portable) (National Broadcasting Co.), 2.392 MHz, 50 watts; W10XAO United States (portable) (National Broadcasting Co.), 1.584 MHz, 50 watts.

Aug. 9, 1930. An Associated Press item has: "Station WMAQ's new television transmitter is to be on the air some time this month. The first regularly scheduled sight programs in conjunction with a sound broadcast station are to provide studio scenes which are to be transmitted three times a day. The television station is W9XAP, 2800 kilocycles."

Aug. 20, 1930. The first demonstration of home reception of television, a half-hour broadcast from the Jenkins station, W2XCR in Jersey City, and the de Forest station W2XCD in Passaic. Two sets were available in public places and one in a press suite. (Or Aug. 25 1930)

July 30, 1930. NBC opens W2XBS, New York. W2XBS started as an RCA lab rig in Apr. 1928 and was used for big screen theater tests as early as Jan. 1930. In July 1930 it was put in charge of NBC broadcast engineers.

Nov. 1930. W9XAP Chicago (Chicago Daily News) broadcast the senatorial election returns. Press release claimed it was the first time a senatorial race, complete with charts showing the standings of the candidates as the votes were tallied, was ever televised.

Dec. 7, 1930. W1XAV Boston broadcasts a video portion of a CBS radio program, *The Fox Trappers* orchestra program, sponsored by I. J. Fox Furriers. Included was what is sometimes called the first television commercial, which was prohibited by FRC regulations. [However, Donna Halper reports that as early as 1928 W1XAY in Lexington Mass. simulcast one hour of WLEX radio daily, and there is a mention of commercials in that hour. She also reports that Big Brother Bob Emery made an appearance on W1XAV, as did several other Boston area announcers, when W1XAV tried on a few occasions in 1930-31 to telecast a Boston radio station's programming. They first tried WEEI and then WNAC. The FRC took a dim view of their attempts to telecast a network program, however, since there was no agreement yet about whether or not experimental TV stations could run network commercials, so the FRC advised them not to try it.]

Dec. 13, 1930. Radio World lists W1XY Lawrence MA (Pilot).

1931. The following stations are listed with 1931 start dates in the 1950 *Broadcasting Yearbook*: ch. 2, KTSL, Hollywood, CA

Feb. 24, 1931. *New York Times* article (p. 32) refers to daily television broadcasts which began the previous evening on W2XCD (De Forest) in Passaic.

Apr. 1931. W2XCR, Jenkins second station, moves from its original site in Jersey City to 655 Fifth Avenue in New York. The station now had 5000 watts power, and could broadcast 60-line pictures rather than 48-line pictures.

Apr. 26, 1931. Jenkins Television Corp. gives a public demonstration on W2XCR, beginning a regular schedule of four hours per day, which lasted into early 1932. Simulcast with WGBS radio.

May 1, 1931. The first marriage is broadcast on TV, on W2XCR New York.

July 21, 1931. W2XAB New York (CBS) begins broadcasting the first regular seven-day-per-week TV broadcasting schedule in the U. S., 28 hours per week with live pickups and a wide variety of programs. The first broadcast included Mayor James J. Walker, Kate Smith, and George Gershwin.

Sept. 4, 1931. W9XD (later WTMJ-TV) Milwaukee licensed. (The first application for a TV license was filed May 5, 1930.)

Oct. 1931. W1XG* Boston (Shortwave and Television Laboratory). This was a VHF station with 30 watts. Chief Engineer was Hollis Baird; studios were at 70 Brookline Ave.

Oct. 18, 1931. British television pioneer John Logie Baird appears on WMCA radio to discuss a proposed television station to be operated jointly by his company and WMCA. (Radio Pictures Inc. objected to the proposed station since the applicant was a foreign organization, and the FRC denied the application.)

Oct. 30, 1931. NBC puts a TV transmitter atop the Empire State Building. The first experimental TV broadcast from the ESB was on Dec. 22, 1931.

1932. RCA demonstrates an all-electronic television system, originally with 120 lines.

Aug. 7, 1932. *New York Times* article describes reception reports received by W2XAB.

Nov. 8, 1932. CBS TV reports on the presidential election to an estimated 7500 sets, or 9000 sets according to CBS's estimate. Program consisted of commentary, return charts, still cartoons of politicians.

Jan. 23, 1933. W9XAL Kansas City first day of broadcasting. [*Journal-Post News Flashes* with John Cameron Swayze begin the following day at 12:00 p.m. as a daily program simulcast on KMBC radio.]

Jan. 25, 1933. W9XK Iowa City, Iowa, begins mechanical TV broadcasts, with sound on its radio station WSUI. The program included a brief overview of the University of Iowa, a musical number, and a drama sketch. W9XK was the first educational station with regularly-scheduled programs.

Feb. 20, 1933. CBS suspends television broadcasts.

Mar. 10, 1933. W6XAO (later KTSL, for Thomas S. Lee, then KNXT and KCBS-TV) Los Angeles begins full-scale broadcasting. An earthquake struck Los Angeles the same day, and films of the damage were broadcast the next day. (W6XAO was the first broadcasting station to show a current full-length motion picture, *The Crooked Circle*.) According to *Broadcasting* magazine, W6XAO started Oct. 4, 1939 and the call was changed to KTSL in 1949 and KNXT in 1951. Another source gives May 6, 1948, as the start date for KTSL.

June 27, 1934. W1XAV Boston is discontinued. The FCC told Shortwave and Television Laboratory that the world didn't need two mechanical TV stations. One license was accepted, the other was denied, effective 13 July 1934. At this point Shortwave and Television changed its name to General Television Corp. and switched from a mechanical to an electronic system.

Dec. 1934. Philo Farnsworth demonstrates a non-mechanical television system.

1935. (Mid 1935) W1XG Boston changes from a mechanical to an electronic system.

April-May 1935. *Short Wave Listener Magazine* for April-May 1935 lists these television stations:

2000-2100 kc.

W2XDR Long Island City NY
 W8XAN Jackson MI
 W9XK Iowa City IA
 W9XAK Manhattan KS
 W9XAO Chicago IL
 W6XAH Bakersfield CA

2750-2850 kc.

W3XAK portable
 W9XAP Chicago IL
 W2XBS Baltimore MD
 W9XAL Kansas City MO
 W9XG West Lafayette IN
 W2XAB New York NY

42000-56000, 60000-86000 kc.

W2XAX New York NY
 W6XAO Los Angeles CA
 W9XD Milwaukee WI
 W2XBT portable
 W2XF New York NY
 W3XE Philadelphia PA
 W3XAD Camden NJ
 W10XX portable and mobile [Vicinity of Camden NJ]
 W2XDR Long Island City NY
 W8XAN Jackson MI
 W9XAT portable
 W2XAD New York NY
 W2XAG portable
 W1XG Boston MA
 W9XK Iowa City IA

Regarding W6XAH in Bakersfield, listed above, Mark D. Luttrell writes that it "was an experimental television station that was operated by Pioneer Mercantile Company in Bakersfield during 1932. The station was an experimental effort by the Schamblin brothers--Frank, Leo and Charles. It has been reported in several publications as 'the first television station west of the Mississippi River.' Due to technical problems the work ended later that year and the company then focused on starting a radio station which went on the air as KPMC 1560 AM in 1933 from Bakersfield. The station was later sold and is now owned by Buckley Radio in Connecticut. ...My grandfather worked in management for the company."

June 29, 1936. 343-line TV transmitted from the Empire State Building on W2XBS, the first high-definition television.

July 7, 1936. NBC's first attempt at actual programming after 6 years of tests: a 30-minute variety show strictly for RCA licensees, speeches, dance ensemble, monologue, vocal numbers, and film clips.

Aug. 15, 1936. *Broadcasting* reports Philco Corp. demonstrates its system of television with seven-mile transmission of live and film subjects in 345-line images 9 1/2 by 7 1/2 inches.

Nov. 6, 1936. RCA displays 343-line TV for the press as part of NBC's tenth anniversary celebration.

Apr. 1, 1937. *Broadcasting* reports CBS applies for experimental video station in New York, plans to install RCA TV transmitter in Chrysler building tower and to construct special studios.

May 1937. Gilbert Seldes becomes the first TV critic, with an article "Errors of Television" in the *Atlantic Monthly*.

May 15, 1937. *Broadcasting* reports RCA demonstrates projection television, with images enlarged to 8 by 10 feet, at Institute of Radio Engineers convention.

Oct. 13, 1937. FCC adopts new television allocations: seven channels between 44 and 108 MHz (44-50, 50-56, 66-72,

78-84, 84-90, 96-102, and 102-108 MHz), and 12 additional channels from 156-194 MHz. The higher channels are earmarked for a time when workable tubes are devised for these frequencies.

May 31, 1938. W2XBS telecasts the movie *The Return of the Scarlet Pimpernel*, starring Leslie Howard; the staff projectionist played the last reel out of order, ending the film 20 minutes early. After this incident, NBC could not obtain first-run movies for many years.

Nov. 15, 1938. First telecast of an unscheduled event, a fire, on NBC's W2XBT. A mobile unit was in a park in Queens when a fire broke out on Ward's Island, across the river. (However on Apr. 24 1936 an outdoor scene of firemen answering an alarm was transmitted by RCA from Camden, New Jersey.)

1939. The following stations are listed with 1939 start dates in the 1950 *Broadcasting Yearbook*: ch. 4, WNBT, New York, NY; ch. 4, WRGB, Schenectady, NY

Apr. 30, 1939. President Roosevelt is the first President to appear on television, from the New York World's Fair on W2XBS, now transmitting on 45.25 MHz visual and 49.75 MHz aural.

May 17, 1939. A Princeton-Columbia baseball game is telecast from Baker Field in New York by W2XBS, the first sports telecast 4 p.m. to 6:15 p.m. Bill Stern was the announcer.

June 1, 1939. First heavyweight boxing match televised, Max Baer vs Lou Nova, form Yankee Stadium.

Aug. 26, 1939. First major league baseball game telecast, a double-header between the Cincinnati Reds and the Brooklyn Dodgers at Ebbets Field, Brooklyn, announcer Walter L. "Red" Barber or Bill Stern (sources differ), on W2XBS.

Sept. 30, 1939. First televised college football game, Fordham vs Waynesburg, at Randall's Island, New York, on W2XBS.

Oct. 22, 1939. First NFL game is televised by W2XBS: Brooklyn Dodgers vs Philadelphia Eagles at Ebbets Field in Brooklyn. Play by play announcer was Allen (Skip) Walz.

Nov. 10, 1939. W2XB (or W2XD?) (WRGB)* Schenectady NY (became WRGB in 1942, on ch. 3 (?), moved from ch. 4 to ch. 6 in 1954).

Jan. 1940. The FCC holds public hearings on television.

Feb. 1, 1940. The first NBC network television program, from W2XBS to Schenectady.

Feb. 25, 1940. First hockey game televised, Rangers vs Canadians, on W2XBS, from Madison Square Garden.

Feb. 26, 1940. The first quiz show, Spelling Bee, on WRGB.

Feb. 28, 1940. FCC announces a limited commercial television service will be authorized beginning on September 1. Standards were not set, pending further research until the best system could be determined. (Two days later the FCC suspended its authorization for commercial service, declaring that the marketing campaign of RCA disregarded the commission's findings and recommendations.)

Feb. 28, 1940. First basketball game televised, from Madison Square Garden, Fordham vs the University of Pittsburgh, by W2XBS.

Mar. 10, 1940. W2XBS utilizes the Metropolitan Opera to broadcast a scene from an opera from its television studio. The audio portion is carried over radio station WJZ.

Mar. 15, 1940. *Broadcasting* reports RCA cuts price of television sets, starts sales drive intended to put a minimum of 25,000 in homes in service area of NBC's New York video station.

Apr. 1, 1940. *Broadcasting* reports FCC suspends order for "limited commercial" operation of TV, censures RCA for sales efforts which are seen as an attempt to freeze TV standards at present level, calls new hearing; critics call move "usurpation of power."

Apr. 13, 1940. W2XWV (WABD) licensed to DuMont.

June 1940. W2XBS (NBC) covers the Republican National Convention from Philadelphia for 33 hours over five days.

Aug. 1940. W9XBK (WBKB)* Chicago (Balaban & Katz/Paramount).

Aug. 29, 1940. Peter Goldmark of CBS announces his invention of a color TV system.

Sept. 3, 1940. First showing of high definition color TV, by W2XAB, transmitting from the Chrysler Building, using 343 lines. This was the first telecast of any kind from CBS since the closing of their scanner station 2/2/33.

1941. W6XYZ (KTLA)* Los Angeles.

1941. The following stations are listed with 1941 start dates in the 1950 *Broadcasting Yearbook*: ch. 4, WBKB, Chicago, IL; ch. 2, WCBS-TV, New York, NY; ch. 3, WPTZ, Philadelphia, PA.

Mar. 1, 1941. *New York Times* lists: Television Sight: 51.25, Sound 55.75; W2XBS 2-5 p.m. test pattern; 730-830 p.m. test pattern; 830 p.m. pick up of... track meet, Madison Square Garden

Mar. 8, 1941. NTSC formally recommends TV standards to the FCC, calling for 525 lines and 30 frames per second.

Apr. 30, 1941. The FCC approves the NTSC standards and authorizes commercial TV to begin on July 1.

May 2, 1941. 10 stations granted commercial TV licenses effective July 1. Stations were required to broadcast 15 hours per week. W2XBS received license number 1.

June 30, 1941. *Broadcasting* reports Bulova Watch Co., Sun Oil Co., Lever Bros. Co. and Procter & Gamble sign as sponsors of first commercial telecasts on July 1 over WNBT New York.

July 1, 1941. Commercial TV authorized.

July 1, 1941 W2XBS New York NY becomes a commercial station, changes call to WNBT (later calls WRCA-TV, WNBC-TV). At 1:29 p.m., General Mills sponsors a Brooklyn Dodgers-Philadelphia Phillies game, followed by the "Sunoco Newscast" with Lowell Thomas. At 9:15 p.m., "Uncle Jims Question Bee," hosted by Bill Slater and sponsored by Spry, made its one-and-only appearance and, at 9:30, Ralph Edwards hosted "Truth Or Consequences," simulcast on radio and TV and sponsored by Ivory Soap. This was the first game show broadcast on TV. The world's first (legal) TV commercial for Bulova watches occurs at 2:29:10 superimposed over a test pattern. [According to microfiche records at the FCC, WNBT was granted a C.P. on 6/17/41 for Channel 1 (50-56 mhz.), effective 7/1/41. License to cover the C.P. granted 6/17/41, eff. 7/1/41. First operation was granted to be effective 7/1/41. The first listed call letters were WNBT. They changed to WRCA on 10/18/54 and to WNBC on 5/22/60.]

July 1, 1941. CBS station in New York changes call to WCBW (later call WCBS-TV), goes on the air with the first news telecast at 2:30 p.m. This was the station's first actual programming other than test patterns and the color demo. At 3:25 p.m., WCBW broadcasts "Jack and the Beanstalk," narrated by Lydia Perera, Ann Francis and animator John Rupe. Mr. Rupe drew cartoons to accentuate the narrative in a program that ran each afternoon for the first several months of the stations operation. [According to microfiche records at the FCC, WCBW was granted a C.P. on 6/24/41 for Channel 2 (60-66 mhz). Program tests authorized to commence on 7/1/41. License to cover the C.P. granted 3/10/42. The date of first operation is shown as 10/29/41. The first listed call letters were WCBW. They changed to WCBS on 11/1/46.]

July 1, 1941. W3XE Philadelphia becomes WPTZ Philadelphia PA (later call KYW-TV). The station was then off during the war. (However *Broadcasting* magazine and the 1946 *Broadcasting Yearbook* give Sept. 1941 as the date for

WPTZ.)

July 1, 1941. *New York Times* lists: WNBT, (2) WCBW, (4) W2XWV

Aug. 7, 1941. The first audience-participation program, a program of charades, is broadcast on WNBT.

Oct. 12, 1941. *New York Times* lists: (1) WNBT, (2) WCBW

1942. The following stations are listed with 1942 start dates in the 1950 *Broadcasting Yearbook*: ch. 5, KTLA-TV, Hollywood, CA

Jan. 6, 1942. FCC grants permission to Du Mont Laboratories to build a commercial TV station, to operate on 78-84 MHz (then channel 4).

Mar. 1, 1942. W2XB Schenectady changes call to WRGB (for Walter R. G. Baker, GE executive.)

Mar. 1, 1942. *New York Times* lists (1) WNBT

Apr. 13, 1942. *Broadcasting* reports minimum program time required of TV stations is cut from 15 hours to four hours a week for war period.

June 28, 1942. [This is the date WABD was established according to the 1946 *Broadcasting Yearbook*. Station would have been W2XWV at the time. However apparently programs for W2XWV were listed in the *New York Times* before this date.]

Oct. 13, 1943. WBKB* Chicago

Sept. 19, 1943. *New York Times* lists: (4) W2XWV

Nov. 7, 1943. *New York Times* lists: (4) W2XWV

Dec. 23, 1943. The first complete opera, Hansel and Gretel, is telecast, by WRGB Schenectady.

Jan. 2, 1944. *New York Times* lists: (4) W2XWV

May 1, 1944. *Broadcasting* reports CBS proposes starting off postwar TV with high-definition, full-color pictures, broadcast on 16 MHz bands.

May 2, 1944. W2XWV becomes a commercial station, changes call to WABD New York NY (later calls WNEW-TV, WNYW-TV). At 9 p.m. station broadcasts "Your World Tomorrow," a 30-minute show consisting of news about World War II and entertainment segments featuring singer Jessica Dragonette. The program was sponsored by Dun22 Plastics. [According to microfiche records at the FCC, WABD was granted a C.P. on 5/2/44 for Channel 4 (78-84 mhz.) License to cover the C.P. granted on 5/2/44. The first listed call letters were WABD. Call changed to WNEW on 9/7/58.]

May 22, 1944. *Broadcasting* reports single ownership of five TV stations is permitted by FCC, up from former limit of three.

Oct. 2, 1944. *Broadcasting* reports FCC opens hearings on postwar allocations with testimony of Radio Technical Planning Board that agreement had been reached to recommend the 41-56 MHz band for FM, TV allocations to extend upwards from there.

Oct. 9, 1944. *Broadcasting* reports CBS, in testimony presented by Paul Kesten, executive vice president, asks for more space for FM, with TV being moved to UHF part of spectrum above 300 MHz.

1945. The following stations are listed with 1945 start dates in the 1950 *Broadcasting Yearbook*: ch. 5, WTTG,

Washington, DC

Jan. 15, 1945. FCC announces allocations proposal for spectrum above 25 MHz: 44-50 Television; 50-54 Amateur; 54-84 Television 84-88 Educational FM broadcasting; 88-102 Commercial FM broadcasting; 102-108 (Non-Government but not yet determined).

May 21, 1945. FCC announces allocation of spectrum above 25 MHz with exception of 44-108 MHz but delays decision as to placement of FM for propagation studies to be made by FCC and industry engineers. The 44-108 MHz spectrum is to be allocated, following tests, on one of the following three alternatives:

Alternative 1: 44- 48 Amateur; 48-50 Facsimile; 50-54 Educational FM broadcasting; 54-68 Commercial FM broadcasting; 68-74 Television; 74-78 Non-Government fixed & mobile -aero markers on 75 MHz to remain as long as required; 78-108 Television, fixed, mobile [shared].

Alternative 2: 44-56 Television; 56-60 Amateur [the same as pre-WW2]; 60-66 Television; fixed; mobile [shared]; 66-68 Facsimile; 68-72 Educational FM broadcasting; 72-86 Commercial FM broadcasting. aero markers remain on 75 MHz as long as required; 86-92 Television; 92-104 Television, fixed, mobile [shared]; 104-108 Non-Government fixed and mobile.

Alternative 3: 44-50 Television, fixed, mobile [shared] 50-54 Amateur; 54-78 Television, fixed, mobile [shared] aero markers remain on 75 MHz as long as required; 78-84 Television; 84-88 Educational FM broadcasting; 88-102 Commercial FM broadcasting; 102-104 Facsimile; 104-108 Non-Government fixed and mobile.

June 4, 1945. *Broadcasting* reports in joint request, FM Broadcasters Inc. and Television Broadcasters Association ask FCC to allocate 44-108 MHz immediately: FM to get 50-54 MHz for educational use, 54-68 MHz for commercial operation; TV to receive 68-74 MHz and 78-108 MHz.

June 27, 1945. FCC allocates 88-92 educational FM; 92-106 commercial FM; 106-108 facsimile broadcasting; 92.1-93.9 community; 94.1-103.9 metro; 104.1-105.9 rural; TV channel 1 44-50; TV channel 2-6 according to the present scheme.

Aug. 9, 1945. WABD New York and WTTG Washington are linked for a network broadcast, according to Alan E. Ruiter, biographer of Allen B. Dumont.

Sept. 20, 1945. WABD(TV) signs off, channel 4, 78-84 MHz; plans to return Dec. 15 on channel 5, 76-82 MHz

Sept. 24, 1945. *Broadcasting* reports FCC distributes 13 VHF channels among 140 markets

1946. The beginning of network television as WNBT begins feeding its programs to Philadelphia and Schenectady on a more-or-less regular basis. (Some programs were fed from New York to both cities as early as 1941.)

Jan. 15, 1946. A directory of U. S. commercial television stations as of this date (from the 1946 *Broadcasting Yearbook* lists:

WBKB	Chicago	66-72 MHz now; channel 4 on Mar. 1	Established 1943
WABD	New York	78-84 MHz now; channel 5 on Mar. 1	Established June 28, 1942
WCBW	New York	60-66 MHz now; channel 2 on Mar. 1	Established July 1, 1941
WNBT	New York	50-56 MHz now; channel 4 on Mar. 1	Established July 1, 1941
WRGB	Schenectady	66-72 MHz now; channel 4 on Mar. 1	Established Nov. 10, 1939
WPTZ	Philadelphia	66-72 MHz now; channel 3 on Mar. 1	Established Sept. 1941
KTSL	Hollywood	50-56 MHz now; undesignated on Mar. 1	Has CP
WTZR	Chicago	50-56 MHz now; undesignated on Mar. 1	Has CP

WMJT	Milwaukee	66-72 MHz now; undesignated on Mar. 1	Has CP
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Jan. 17, 1946. W18XGZ Charleston seeks license to cover experimental TV (Zaharis)

Jan. 31, 1946. WTZR* Chicago IL (Zenith).

Feb. 4, 1946. *Broadcasting* reports CBS demonstrates color-television film program broadcast from its new UHF transmitter; says with industry cooperation color for the home can be available within a year.

Feb. 18, 1946. *Broadcasting* reports first Washington-New York telecast through AT&T coaxial cable is termed success by engineers and viewers.

Feb. 25, 1946. New TV channel assignments go into effect; among the changes: WCBW from 60-66 to (2) and WNBT from 50-56 to (4).

Mar. 1, 1946. Modern channel allocation system goes into effect with channel 1 44-50 MHz, channel 2 54-60 MHz, etc.; WCBW(TV) and WNBT(TV) go off the air for channel conversions (WNBT resumes May 9 on channel 4)

Apr. 22, 1946. *Broadcasting* reports CBS color-television program is successfully transmitted over 450-mile coaxial cable link from New York to Washington and back.

May 9, 1946. First variety show premieres, *Hour Glass*, on NBC. The show ran 10 months.

June 19, 1946. First televised heavyweight title fight (Joe Louis vs Billy Conn), broadcast from Yankee Stadium, is seen by the largest television audience to see a fight. 141,000.

Sept. 6, 1946. W9XBK changes its call to WBKB(TV) Chicago IL, ch. 4 (later ch. 2; later call WBBM-TV).

Sept. 30, 1946. *Broadcasting* reports CBS petitions FCC to adopt standards and authorize commercial operation of color-television stations in UHF frequencies immediately.

Oct. 1, 1946. *New York Times* lists (2) WCBW, (4) WNBT, (5) WABD

Oct. 2, 1946. *Faraway Hill* airs on the DuMont network, becoming the first TV network soap opera.

Nov. 1946. WTTG* Washington (DuMont), according to one source; however, the 1954 *Telecasting Yearbook* gives Jan. 1 1947 and *Broadcasting* magazine gives January 1947. The call stands for Thomas T. Goldsmith, DuMont's chief engineer. (Station was originally W3XWT. Starting May 28, 1945, it had given test pattern and recorded announcements asking for reception reports. None was received for 3 months. The U. S. Navy finally picked it up while monitoring for "suspicious" radio signals.)

Nov. 1, 1946. WCBW changes call to WCBS-TV.

Nov. 4, 1946. *Broadcasting* reports RCA demonstrates all-electronic system of color TV.

Nov. 11, 1946. *Broadcasting* reports Bristol-Myers is the first advertiser to sponsor a television-network program, *Geographically Speaking*, which started Oct. 27 on NBC-TV's two-station network.

Dec. 24, 1946. The first church service telecast, Grace Episcopal Church in New York, on WABD on the New York-Philadelphia-Washington network.

1947. The following stations are listed with 1947 start dates in the 1950 *Broadcasting Yearbook*: ch. 4, WNBW, Washington, DC; ch. 7, WMAL-TV, Washington, DC; ch. 2, WMAR-TV, Baltimore, MD; ch. 4, WWJ-TV, Detroit, MI; ch. 5, KSD-TV, St. Louis, MO; ch. 5, WABD, New York, NY; ch. 5, WEWS, Cleveland, OH; ch. 6, WFIL-TV,

Philadelphia, PA; ch. 3, WTMJ-TV, Milwaukee, WI

Jan. 22, 1947. W6XYZ changes call to KTLA(TV)* (5), first commercial TV west of Chicago. A 30-minute show is telecast from the Paramount TV stage, featuring Bob Hope, Jerry Colonna, Dorothy Lamour, and William Bendix. The FCC microfiche records show the station was granted a Special Temporary Authorization for commercial operation on 1/9/47 and that the date of its first commercial license was 2/9/53.

Jan. 30, 1947. The FCC declares that the CBS color system is "premature" and requires further testing before it could be approved.

Feb. 8, 1947. KSD-TV* St. Louis MO, ch 5.

Mar. 4, 1947. WWDT (WWJ-TV) Detroit MI, ch 4, experimental (regular programs June 3).

Mar. 24, 1947. *Broadcasting* reports FCC denies CBS petition for commercial color-TV operation, sends color back to labs for continued search for "satisfactory" system.

May 7, 1947. *Kraft Television Theater* premieres on NBC, the first regularly scheduled drama series on a network.

June 27, 1947. WNBW-TV (WRC-TV)* Washington DC (was W3XNB).

Sept. 13, 1947. WFIL-TV* Philadelphia PA, ch. 6.

Sept. 30, 1947. The opening game of the World Series is the first World Series game to be telecast, between the New York Yankees and the Brooklyn Dodgers at Yankee Stadium. The game was carried by WABD, WCBS-TV, and WNBT in New York, and was also telecast in Philadelphia, Schenectady, and Washington. The 1947 World Series brought in television's first mass audience, and was seen by an estimated 3.9 million people, mostly in bars [Tim Brooks].

Oct. 3, 1947. WMAL-TV (WJLA-TV)* Washington DC, ch. 7, the first VHF high band station.

Oct. 5, 1947. First presidential address telecast from the White House: Truman speaks about food conservation and the world food crisis, proposing meatless Tuesdays and eggless and poultry-less Thursdays

Oct. 17, 1947. WEWS* Cleveland OH.

Oct. 27, 1947. WMAR-TV* Baltimore MD, ch. 2.

Nov. 6, 1947. *Meet the Press* first appears as a local program in Washington.

Nov. 17, 1947. *Broadcasting* reports television network service extends to Boston with the opening of AT&T radio relay system between that city and New York.

Nov. 20, 1947. *Meet the Press* first network telecast. (Became a weekly program on Sept. 12, 1948.)

Dec. 3, 1947. WTMJ-TV* Milwaukee WI, ch. 3 (later ch. 4) (previous experimental operation as W9XMJ and W9XD.)

Dec. 17, 1947. WEWS* Cleveland OH, ch. 5.

Dec. 27, 1947. *Puppet Television Theater* (later called *Howdy Doody Time*), debuts on NBC TV with Buffalo Bob Smith. It was carried by six stations.

1948. The following stations are listed with 1948 start dates in the 1950 *Broadcasting Yearbook*: ch. 9, KFI-TV, Los Angeles, CA; ch. 13, KLAC-TV, Los Angeles, CA; ch. 5, KPIX, San Francisco, CA; ch. 6, WNHC-TV, New Haven, CT; ch. 8, WSB-TV, Atlanta, GA; ch. 7, WENR-TV, Chicago, IL; ch. 9, WGN-TV, Chicago, IL; ch. 5, WAVE-TV, Louisville, KY; ch. 6, WDSU-TV, New Orleans, LA; ch. 4, WBZ-TV, Boston, MA; ch. 7, WNAC-TV, Boston, MA; ch.

11, WBAL-TV, Baltimore, MD; ch. 13, WAAM, Baltimore, MD; ch. 7, WXYZ-TV, Detroit, MI; ch. 5, KSTP-TV, St. Paul, MN; ch. 13, WATV, Newark, NJ; ch. 4, KOB-TV, Albuquerque, NM; ch. 4, WBEN-TV, Buffalo, NY; ch. 7, WJZ-TV, New York, NY; ch. 11, WPIX, New York, NY; ch. 8, WHEN, Syracuse, NY; ch. 4, WLWT, Cincinnati, OH; ch. 4, WNBK, Cleveland, OH; ch. 13, WSPD-TV, Toledo, OH; ch. 10, WCAU-TV, Philadelphia, PA; ch. 4, WMCT, Memphis, TN; ch. 5, WBAP-TV, Fort Worth, TX; ch. 4, KDYL-TV, Salt Lake City, UT; ch. 6, WTVR, Richmond, VA; ch. 5, KING-TV, Seattle, WA

[WLWT was previously W8XCT.]

1948. ABC broadcasts the series *On the Corner* on four stations. ABC considers this its first network show, although an earlier show, *Play the Game*, produced by ABC using DuMont's facilities, was seen on a network.

1948. CBS begins network programming.

Jan. 1, 1948. *New York Times* lists: (2) WCBS-TV, (4) WNBT, (5) WABD.

Jan. 18, 1948. The Original Amateur Hour with Ted Mack debuts.

Feb. 9, 1948. WLWT(TV)* Cincinnati OH, ch. 4 (later ch. 5).

Mar. 1, 1948. WCAU-TV* Philadelphia PA (was W3XAU).

Mar. 11, 1948. WBAL-TV* Baltimore MD, ch. 11.

Mar. 15, 1948. WCAU-TV* Philadelphia PA, ch. 10.

Apr. 5, 1948. WGN-TV* Chicago IL, ch. 9.

Apr. 22, 1948. WTVR (WTVR-TV)* Richmond VA, ch. 6.

Apr. 27, 1948. KSTP-TV* St. Paul-Minneapolis MN, ch. 5.

May 6, 1948. KTSL(TV)* (KNXT) Los Angeles CA, ch. 2.

May 10, 1948. *Broadcasting* reports FCC orders into effect earlier proposal assigning TV ch. 1 (44-50 mc) to nongovernmental fixed and mobile services, denying FM spokesmen's pleas for that channel for use in FM network relaying; gives FM stations in 44-50 mc band until end of year to move to 88-108 mc; issues proposed new expanded TV allocation table; calls hearing on feasibility of TV use of frequencies above 475 mc; proposes required minimum hours of TV station operation be scaled from 12 hours a week for first 18 months to 28 hours a week after 36 months.

May 14, 1948. WBEN-TV* Buffalo NY, ch. 4.

May 15, 1948. WATV(TV)* (WNTA-TV, WNBT-TV, WNET-TV)* Newark NJ. [According to an Internet web page, WATV began licensed operations on Jan. 2 1948.]

June 8, 1948. Milton Berle Show premieres on NBC.

June 9, 1948. WBZ-TV* Boston MA, ch. 4.

June 15, 1948. WPIX-TV* New York NY, ch. 11; WNHC-TV* New Haven (ch. 6, moved to channel 8 in December, 1953; became WTNH in 1972) (was affiliated with NBC, CBS with a little ABC and DuMont programming as well; exclusively an ABC affiliate since September, 1955)

June 20, 1948. *Toast of the Town*, with Ed Sullivan, premieres on CBS, with guests Dean Martin and Jerry Lewis. (The name was changed to the *Ed Sullivan Show* on September 18, 1955.)

June 21, 1948. First network telecast of political conventions; both parties meet in Philadelphia that year; telecasts reach cities connected to network lines with Philadelphia. NBC sends edited kinescope recordings for next-day telecasts on those stations not yet connected to the network.

June 21, 1948. WNAC-TV (WNEV-TV, WHDH)* Boston MA, ch. 7.

July 21, 1948. WSPD-TV* Toledo OH, ch. 13.

July 30, 1948. Professional wrestling premieres on prime-time network TV (DuMont).

July 1, 1948. KDYL-TV (KCPX-TV)* Salt Lake City UT, ch. 4.

Aug. 10, 1948. WJZ-TV (WABC-TV)* New York NY, ch. 7, 7 p.m. The first broadcast originated from the Palace Theater on Broadway with a four-hour show. The opening act was Carlton Emmys dog act, followed by stars such as Ray Bolger, Beatrice Lillie, Pat Rooney, Ella Logan, James Barton, Willie West and McGinty, Buck and Bubbles, Walter "Dare" Wahl, Gus Van, Henry Morgan, Raye and Naldi, and Paul Whiteman and his orchestra.

Aug. 10, 1948. *Candid Camera* debuts on ABC.

Aug. 15, 1948. The first network nightly newscast, CBS-TV News, debuts on CBS with Douglas Edwards.

Aug. 25, 1948. KSEE (KFI-TV, KHJ-TV)* Los Angeles CA, ch. 9 (was W6XEA). However another source says KHJ-TV went on the air as KFI-TV on Oct. 6, 1948.

Aug. 27, 1948. Whitaker Chambers, appearing on *Meet the Press*, accuses Alger Hiss of being a communist.

Sept. 21, 1948. *Texaco Star Theater*, with Milton Berle, premieres on NBC (or Sept. 14)

Sept. 17, 1948. KLAC-TV* (KCOP-TV)* Los Angeles CA, ch. 13; WENR-TV (WBKB-TV, WLS-TV)* Chicago IL, ch. 7.

Sept. 29, 1948. WSB-TV* Atlanta GA, ch. 8. (With the merger in 1951 of *Atlanta Constitution* into *Atlanta Journal*, Cox took over the ch. 2 facility of *Constitution* and sold channel 8 to Broadcasting, Inc.)

Sept. 29, 1948. WBAP-TV* Fort Worth TX, ch. 5.

Sept. 30, 1948. FCC freezes new TV applications; channel 1 deleted, assigned to land mobile

Oct. 8, 1948. WNBX (WNBQ, WMAQ-TV)* Chicago, first telecast (a World Series game). *Broadcasting* magazine says WNBQ went on the air Sept. 1, 1948.

Oct. 9, 1948. WXYZ-TV* Detroit MI, ch. 7.

Oct. 24, 1948. WJBK-TV* Detroit MI, ch. 2.

Oct. 31, 1948. WNBK (KYW-TV, WKYC-TV)* Cleveland OH, ch. 4 (later ch. 3).

Nov. 2, 1948. WAAM-TV (WJZ-TV)* Baltimore MD, ch. 13.

Nov. 24, 1948. WAVE-TV* Louisville KY, ch. 5 (later ch. 3).

Nov. 25, 1948. KRSC-TV (KING-TV)* Seattle WA, ch. 5.

Nov. 27, 1948. WDTV (KDKA-TV)* Pittsburgh sends out its first signal, ch. 3 (although Jan. 11, 1949, is considered the start date below).

Nov. 29, 1948. KOB-TV* Albuquerque NM, ch. 4; Kukla, Fran and Ollie debuts on NBC. (Show had previously aired on WBKB Chicago as Junior Jamboree beginning Oct. 13, 1947.)

Dec. 1, 1948. WHEN-TV* Syracuse NY, ch. 8 (moved to ch. 5 in July 1961)

Dec. 11, 1948. WMCT (WMC-TV)* Memphis TN, ch. 4 (later ch. 5).

Dec. 18, 1948. WDSU-TV* New Orleans LA, ch 6. 6 p.m.

Dec. 22, 1948. KGO-TV* San Francisco CA.

Dec. 24, 1948. The first Catholic midnight mass is telecast by WNBT, WJZ-TV, and WCBS-TV.

1949. The following stations are listed with 1949 start dates in the 1950 *Broadcasting Yearbook*: ch. 4, WBRC-TV, Birmingham, AL; ch. 13, WAFM-TV, Birmingham, AL; ch. 5, KPHO-TV, Phoenix, AZ; ch. 4, KNBH, Los Angeles, CA; ch. 7, KECA-TV, Los Angeles, CA; ch. 11, KTTV, Los Angeles, CA; ch. 8, KFMB-TV, San Diego, CA; ch. 4, KRON-TV, San Francisco, CA; ch. 7, KGO-TV, San Francisco, CA; ch. 9, WOIC, Washington, DC; ch. 7, WDEL-TV, Wilmington, DE; ch. 4, WMBR-TV, Jacksonville, FL; ch. 4, WTVJ, Miami, FL; ch. 5, WAGA-TV, Atlanta, GA; ch. 5, WOC-TV, Davenport, IA; ch. 5, WNBQ, Chicago, IL; ch. 10, WTTV, Bloomington, IN; ch. 6, WFBM-TV, Indianapolis, IN; ch. 2, WJBK-TV, Detroit, MI; ch. 7, WLAV-TV, Grand Rapids, MI; ch. 4, WTCN-TV, Minneapolis, MN; ch. 4, WDAF-TV, Kansas City, MO; ch. 3, WBTV, Charlotte, NC; ch. 2, WFMY-TV, Greensboro, NC; ch. 3, KMTV, Omaha, NE; ch. 6, WOW-TV, Omaha, NE; ch. 12, WBNF-TV, Binghamton, NY; ch. 9, WOR-TV, New York, NY; ch. 6, WHAM-TV, Rochester, NY; ch. 7, WCPO-TV, Cincinnati, OH; ch. 7, WKRC-TV, Cincinnati, OH; ch. 3, WLWC, Columbus, OH; ch. 6, WTVN, Columbus, OH; ch. 10, WBNS-TV, Columbus, OH; ch. 5, WLWD, Dayton, OH; ch. 13, WHIO-TV, Dayton, OH; ch. 4, WKY-TV, Oklahoma City, OK; ch. 6, KOTV, Tulsa, OK; ch. 12, WICU, Erie, PA; ch. 13, WJAC-TV, Johnstown, PA; ch. 4, WGAL-TV, Lancaster, PA; ch. 3, WDTV, Pittsburgh, PA; ch. 11, WJAR-TV, Providence, RI; ch. 4, KRLD-TV, Dallas, TX; ch. 8, KBTB, Dallas, TX; ch. 2, KLEE-TV, Houston, TX; ch. 4, WOAI-TV, San Antonio, TX; ch. 5, KSL-TV, Salt Lake City, UT; ch. 5, WSAZ-TV, Huntington, WV

Jan. 1, 1949. KLEE-TV (KPRC-TV)* Houston TX, ch. 2; KTTV* Los Angeles.

Jan. 3, 1949. Colgate Theatre premieres on NBC.

Jan. 10, 1949. The Goldbergs premieres on CBS.

Jan. 11, 1949. A two-hour special on all networks celebrates the linking of eastern and midwestern networks via coaxial cable; WDTV (KDKA-TV)* Pittsburgh PA, ch. 3 (later ch. 2).

Jan. 16, 1949. KNBH (KRCA, KNBC)* Los Angeles CA; WOIC (WTOP-TV)* Washington DC.

Jan. 17, 1949. *Broadcasting* reports AT&T coaxial cable links East Coast and Midwest television stations.

Jan. 31, 1949. *Broadcasting* reports first Emmy awards ceremony is held, and broadcast by KTSL(TV) Los Angeles.

Feb. 23, 1949. WHIO-TV* Dayton OH, ch. 13 (later ch. 7).

Mar. 8, 1949. WAGA-TV* Atlanta GA.

Mar. 15, 1949. WLWD (WDTN-TV)* Dayton OH, ch. 5 (later ch. 2); WICU-TV* Erie PA, ch. 12.

Mar. 18, 1949. WGAL-TV* Lancaster PA, ch 4 (later ch. 8).

Mar. 21, 1949. WTVJ(TV)* Miami FL.

April 1949. KTLA Los Angeles broadcasts 27 hours and 30 minutes of live coverage of the effort to rescue three-year-old Kathy Fiscus, who had fallen into a well. The event gripped Los Angeles and stimulated sales of TV sets in the city.

Apr. 3, 1949. WLWC* Columbus OH, ch. 3 (later ch. 4).

Apr. 4, 1949. WKRC-TV* Cincinnati OH, ch. 11 (later ch. 12).

May 1949. The first telethon, benefitting the Damon Runyon Cancer Fund, is hosted by Milton Berle. It aired for 24 hours.

May 5, 1949. KGO-TV* San Francisco CA.

May 9, 1949. *Broadcasting* reports FCC authorizes NBC to operate a UHF station at Bridgeport CT for experimental rebroadcasts of programs of WNBT New York.

May 16, 1949. KFMB-TV* San Diego CA; Milton Berle appears on the covers of both Time and Newsweek.

May 22, 1949. WAFM-TV (WABT, WAPI-TV)* Birmingham AL.

May 30, 1949. WFBM-TV* Indianapolis IN, ch. 6 *Broadcasting* reports longest direct TV pickup, 129 miles, is made by KFMB-TV San Diego during dedication when it got and rebroadcast salute from KTLA(TV) Los Angeles without special equipment of any kind.

June 1, 1949. KSL-TV* Salt Lake City UT, ch. 5.

June 6, 1949. WKY-TV* Oklahoma City OK, ch. 4.

June 11, 1949. WHAM-TV (WROC-TV)* Rochester NY, ch. 6 (later ch. 5, and later in a trade to ch. 8).

June 27, 1949. *Captain Video* debuts on DuMont.

July 1, 1949. WBRC-TV* Birmingham AL ch. 4 (to ch. 6 in 1953); WTCN-TV (WCCO-TV)* Minneapolis-St. Paul MN, ch. 4.

July 10, 1949. WJAR-TV* Providence RI, ch. 11 (later ch. 10).

July 11, 1949. FCC announces TV allocation plan; to add 42 UHF channels to the present 12 VHF channels, with another 23 to 28 UHF channels reserved for experimental television, providing for 2,245 TV stations in 1400 communities.

July 15, 1949. WBTV* Charlotte NC, ch. 3.

July 18, 1949. WJAR-TV* Providence ch. 11 (moved to ch. 10 in May 1953).

July 26, 1949. WCPO-TV* Cincinnati OH, ch. 7 (later ch. 9).

Aug. 15, 1949. WLAV-TV (WOOD-TV)* Grand Rapids MI, ch. 7 (later ch. 8).

Aug. 25, 1949. RCA announces the development of a compatible color TV system.

Aug. 29, 1949. WOW-TV* Omaha NE, ch. 6.

Aug. 30, 1949. WTVN-TV* Columbus OH, ch. 6.

Sept. 1, 1949. KMTV* Omaha NE, ch. 3.

Sept. 15, 1949. WMBR-TV (WJXT)* Jacksonville FL, ch. 4; WJAC-TV* Johnstown PA, ch. 13 (later ch. 6).

Sept. 16, 1949. KECA-TV (KABC-TV)* Los Angeles.

Sept. 17, 1949. KBTW (WFAA-TV)* Dallas TX, ch. 8.

Sept. 22, 1949. WFMY-TV* Greensboro NC, ch. 2.

Oct. 5, 1949. WBNS-TV* Columbus OH, ch. 10.

Oct. 6, 1949. The *Ed Wynn Show* becomes the first regularly scheduled network show to broadcast from the West Coast, where it is seen live.

Oct. 11, 1949. WOR-TV (WWOR-TV)* New York NY, ch. 9 (was W2XBB; later to Secaucus NJ). An Internet web page says the inaugural broadcast was Oct. 11 1949 and began at 7 p.m., with soprano Joan Roberts accompanied by an off-stage pianist in the 15-minute "Joan Roberts Show." That was followed by "Apartment 3C," a domestic comedy starring John and Barbara Gay and the "John Reed King Show," a giveaway sponsored by Flagstaff Foods, "The Handy Man," featuring Jack Creamer with tips for homemakers. Then "The Barry Gray Show" with guests Myron Cohen, Irving Caesar, Tony Canzoneri, the Di Castro Sisters and Hope Miller with interviews conducted from the roof studio at the New Amsterdam Theater.

Oct. 14, 1949. WSAZ-TV Huntington WV 1st test pattern, channel 5 (regular programming begins Oct. 24)

Oct. 16, 1949. WDAF-TV* Kansas City MO, ch. 4.

Oct. 22, 1949. KOTV* Tulsa OK, ch. 6.

Oct. 31, 1949. WOC-TV (KWQC)* Davenport IA, ch 5 (later ch. 6).

Nov. 11, 1949. WTTV* Bloomington-Indianapolis IN, ch. 10 (later ch. 4).

Nov. 15, 1949. KRON-TV* San Francisco CA; WSAZ-TV* Huntington WV, ch. 5 (later ch. 3).

Dec. 1, 1949. WNBC-TV* Binghamton NY, ch. 12; WKTV* Utica NY, ch 13 (later ch. 2).

Dec. 3, 1949. KRLD-TV (KDFW-TV)* Dallas TX, ch. 4.

Dec. 4, 1949. KPHO-TV* Phoenix AZ.

Dec. 11, 1949. WOAI-TV* San Antonio TX, ch. 4.

Dec. 19, 1949. WXEL (WJW-TV)* Cleveland OH, ch. 9 (later ch. 8).

Dec. 29, 1949. KC2XAK, first experimental UHF TV station operating on a regular basis is opened by NBC at Bridgeport CT on 529-535 MHz.

Feb. 2, 1950. *What's My Line* debuts on CBS.

Feb. 15, 1950. WSyr-TV* Syracuse NY, ch. 5 (later ch. 3); KEYL (KGBS-TV, KENS-TV)* San Antonio TX, ch. 5.

Feb. 21, 1950. WOI-TV* Ames IA, ch 4 (later channel 5).

Feb. 25, 1950. Your Show of Shows premieres on NBC.

Mar. 27, 1950. WHAS-TV* Louisville KY, ch. 9 (later ch. 11). [According to a history of WHAS, the station originally operated with 9600 watts, but increased power to 50 kW visual on Aug. 7, 1951, the first TV station to broadcast with this much visual power. On Feb. 7, 1953, the station moved to Channel 11 and became the nation's first station with 316,000 watts visual ERP.]

Apr. 2, 1950. WTAR-TV* Norfolk VA, ch. 4 (later ch. 3).

May 1, 1950. WJIM-TV* Lansing MI, ch. 6.

May 29, 1950. *Broadway Open House* debuts.

June 1, 1950. WKZO-TV* Kalamazoo MI, ch. 3.

July 1, 1950. WHBF-TV* Rock Island IL, ch. 4.

July 10, 1950. *Your Hit Parade* premieres on NBC.

Sept. 4, 1950. *Broadcasting* reports FCC states it will adopt the CBS color-television system unless set makers agree to "bracket standards" to enable sets to receive both present 525-line pictures and the 405-line images proposed by CBS; if they agree, commission will adopt "bracket standards" for black-and-white TV and postpone color decision.

Sept. 30, 1950. WSM-TV* Nashville TN, ch. 4.

Oct. 10, 1950. The FCC approves CBS color TV system, effective Nov. 20. CBS promises 20 hours of color programs a week within two months. RCA continues work on its compatible system. Manufacturers are divided as to whether to make sets and converters to receive CBS colorcasts.

Mar. 26, 1951. *Broadcasting* reports FCC reveals proposed allocation plan making full use of UHF band in addition to 12 VHF channels to provide for some 2,000 TV stations in more than 1,200 communities.

May 28, 1951. The U. S. Supreme Court upholds the FCC's approval of the CBS color system.

June 25, 1951. CBS broadcasts color using its non-compatible system. The one-hour program, called *Premiere*, featured Ed Sullivan and other CBS stars, and is carried on a five-station East Coast CBS-TV hookup.

Late June 1951. RCA demonstrates its new electronic color system.

Aug. 11, 1951. First baseball games televised in color, a double-header between the Brooklyn Dodgers and the Boston Braves, by WCBS-TV. Red Barber and Connie Desmond were the announcers.

Sept. 4, 1951. First transcontinental TV broadcast, featuring President Truman.

Sept. 22, 1951. First live sporting event seen coast-to-coast: a college football game between Duke and the University of Pittsburgh, at Pittsburgh (NBC-TV).

Oct. 1, 1951. WLTV (WAIL-TV, WQXI-TV)* Atlanta GA, originally ch. 8, later ch. 11.

Oct. 3, 1951. First live coast-to-coast network telecast of a World Series game (produced by Gillette, aired on NBC, CBS and ABC).

Oct. 15, 1951. *I Love Lucy* premieres on CBS.

Nov. 18, 1951. *See It Now* premieres on CBS, showing live shots of the Statue of Liberty and San Francisco Bay.

Dec. 24, 1951. First televised opera written for television, *Amahl and the Night Visitor*, on NBC.

1952. KTLA makes the first telecast of an atomic bomb detonation. Klaus Landsberg led the engineering feat on short notice that established microwave links that had previously been considered impossible with existing technology. The station fed the coverage to the nation.

Jan. 14, 1952. *Today* show premieres on NBC.

Apr. 14, 1952. FCC lifts TV freeze as of July 1; provides for 617 VHF and 1436 UHF allocations, including 242 non-commercial educational stations; establishes 3 zones with different mileage separation and antenna-height regulations; changes required of 30 TV stations.

Sept. 18, 1952. KPTV(TV)* Portland, the first commercial UHF TV station, transmits its first test pattern, on ch. 27.

Sept. 23, 1952. Richard Nixon's "Checkers" speech is delivered.

Oct. 12, 1952. KBTW(TV)* Denver (9), first post-freeze station in channels 7-13

Dec. 21, 1952. WSBT-TV* South Bend IN. [The station claims to be the longest continuously broadcasting UHF television station in the U. S., and the first UHF station to produce a live telecast.]

Late 1952 to 1954. Numerous TV stations switched channels. This list may not be complete.

CALL	CITY	FROM	TO
WBRC-TV	Birmingham	4	6
WLTW	Atlanta	8	11
WMAZ-TV	Macon	7	13
WBKB or WBBM-TV	Chicago	4	2
WTTV	Bloomington	10	4
WOI-TV	Ames	4	5
WOC-TV	Davenport	5	6
WAVE-TV	Louisville	5	3
WHAS-TV	Louisville	9	11
WLAV-TV	Grand Rapids	7	8
WHAM-TV	Rochester	6	5
WRGB	Schenectady	4	6
WSYR	Syracuse	5	3
WKTV	Utica	13	2
WCPO-TV	Cincinnati	7	9
WKRC-TV	Cincinnati	11	12
WLWT	Cincinnati	4	5

WNBK	Cleveland	4	3
WXEL or WJW-TV	Cleveland	9	8
WLWC	Columbus	3	4
WHIO-TV	Dayton	13	7
WLWD	Dayton	5	2
WJAC-TV	Johnstown	13	6
WDTV	Pittsburgh	3	2
WGAL-TV	Lancaster	4	8
WJAR-TV	Providence	11	10
WMCT	Memphis	4	5
WTAR-TV	Norfolk	4	3
WSAZ-TV	Huntington	5	3
WTMJ-TV	Milwaukee	3	4

Mar. 8, 1953. WFMJ-TV Youngstown begins broadcasting on channel 73, the highest channel so far.

Mar. 25, 1953. CBS concedes victory to RCA in the war over color TV standards.

Apr. 3, 1953. First issue of *TV Guide* is published, with 10 editions and a circulation of 1,562,000 copies.

May 25, 1953. KUHT* Houston, the first non-commercial educational TV station, begins regular programming.

May 29, 1953. *St. Petersburg Times* reports WSUN-TV will go on the air with a half-hour dedication ceremony at 4:15 p.m. May 31 (test patterns are currently being transmitted) channel 38 (to 2/23/70)

Aug. 30, 1953. NBC's *Kukla, Fran, and Ollie Show* is broadcast in color, the first publicly announced experimental network broadcast in compatible color.

Sept. 28, 1953. *Broadcasting* reports that, with the end of daylight saving time, CBS and NBC inaugurate "hot kinescope" systems to put programs on air on the West Coast at same clock hour as in the East.

Oct. 19, 1953. Arthur Godfrey fires Julius La Rosa on the air.

Nov. 22, 1953. RCA tests its compatible color TV system on the air for the first time with a telecast of the *Colgate Comedy Hour*. [or Nov. 23?]

Dec. 17, 1953. FCC reverses its 1951 decision and approves the RCA/NTSC color system. NBC broadcasts the NBC chimes image at 5:31:17 p.m. using NTSC standards. CBS broadcasts the first live color program at 6:15 p.m.; NBC followed with a live program at 6:30 p.m.

Jan. 1, 1954. NBC broadcasts the Rose Parade in color on 21 stations.

Mar. 9, 1954. Edward R. Murrow denounces Sen. Joseph R. McCarthy on *See It Now*.

Apr. 1, 1955. Dumont drastically cuts back its programming; very few Dumont shows stay on the air past this date. By September, 1955, Dumont programming has been reduced to NFL football on Sunday afternoons, boxing on Monday nights, and some college football on Saturday afternoons.

Oct. 17, 1954. WNBC to WRCA AM, FM, TV, at midnight; KNBH(TV) to KRCA(TV), WNBW(TV) to WRC-TV

Dec. 13, 1954. *Broadcasting* reports WBRE-TV Wilkes-Barre PA is ready to become the first UHF station to use 1,000 KW, maximum ERP authorized by the FCC.

Apr. 18, 1955. *Broadcasting* reports that DuMont switches to a film network, using Electronicam, reserving live relays for special events and sports.

Sept. 28, 1955. First World Series game broadcast in color, by WRCA-TV.

Apr. 1956. WNBQ Chicago replaces all black-and-white equipment with color equipment, becoming first TV station to broadcast all its local programming in color.

Apr. 1956. Ampex demonstrates first practical videotape recorder at NAB Convention in Chicago. The three networks immediately place orders for Ampex VTR's, which begin to arrive later in the year.

July 2, 1956. *Broadcasting* reports FCC uncovers plan for long-range shift of TV to all UHF and, for present, proposes deintermixture in 13 markets.

Aug. 8, 1956. Final telecast of the Dumont network, a boxing card. Although Dumont ceased network operations, the boxing show continued locally in New York until 1958. CBS inherits the rest of the Dumont/NFL football deal, giving the NFL its first-ever true national TV exposure.

Oct. 29, 1956. First use of videotape in network television programming: CBS uses its first Ampex VTR to be installed at Television City, Los Angeles, to record the evening news (then anchored by Douglas Edwards) and in turn, feeds the tape to West Coast stations three hours later. Previously, West Coast rebroadcasts had been done by kinescope recordings.

Oct. 29, 1956. Chet Huntley and David Brinkley take over anchor duties of NBC newscast, which is renamed "The Huntley-Brinkley Report."

Nov. 1956. First use of videotape in production of a network television entertainment program: Jonathan Winters, at the time doing a 15-minute show a couple of nights a week on NBC-TV, uses videotape and superimposing/montage techniques to be able to play two characters in the same skit. During such skits, he tapes the actions and dialogues of one of the two characters he played and did the other live. (His show, except for taped bits to allow him to play two characters, is otherwise done live).

Mar. 16, 1962. Walter Cronkite succeeds Douglas Edwards as anchorman of the *CBS Evening News*.

July 9, 1962. Telstar communications satellite is launched into orbit. [The first test transmissions between the U. S., France, and Britain occurred the next day. This was not actually the first trans-Atlantic TV, as the BBC and German TV were received in the 1930s in Long Island and perhaps elsewhere in the U. S.]

July 23, 1962. A joint ABC/CBS/NBC production is telecast to Europe via Telstar. The program featured excerpts of a baseball game at Wrigley Field, Chicago, a live news conference by President Kennedy, and a concert by the Mormon Tabernacle Choir, who had traveled to Mount Rushmore to perform. The host of the U. S.-to-Europe program was Chet Huntley of NBC.

May 15, 1963. First TV pictures transmitted from a manned U.S. space capsule, astronaut Gordon Cooper's "Faith 7." Because the picture quality is poor, only NBC carries the transmission, and on tape-delay, not live.

Sept. 2, 1963. CBS becomes first network to expand early-evening network news from 15 to 30 minutes.

Sept. 9, 1963. NBC expands early-evening network news to 30 minutes. (ABC did not follow until Jan. 2 1967, since their affiliates were strongly opposed to give up the extra 15 minutes, especially as ABC's news was then a very-distant third place).

Apr. 30, 1964. Television sets manufactured as of this date are required to receive UHF channels.

Oct. 10, 1964. Live telecast on NBC-TV (via Syncom III) of the opening ceremonies of the 1964 Summer Olympics in Tokyo (airing on the U. S. East Coast from 1 to 3 A.M.); first live color TV program ever transmitted to the U. S. by satellite.

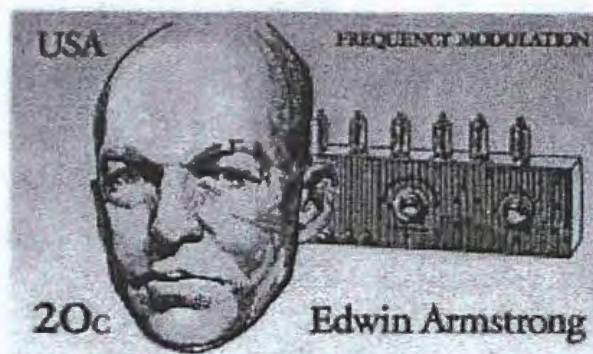
Mar. 24, 1965. Live TV pictures from unmanned U. S. moon probe Ranger 9 transmitted prior to impact in the crater Alphonsus.

May 1967. Premiere of the *Las Vegas Late Show* with Bill Dana, which was supposed to be the cornerstone of the United Network, an attempt to launch a fourth commercial TV network. In less than a month, both the show and the fourth network idea get canceled.

Oct. 14, 1968. First live network transmission of TV pictures from inside a manned U.S. space capsule in orbit: Apollo 7. There were six such broadcasts during their eleven-day mission.

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FM Broadcasting Chronology



A 1983 U. S. postage stamp depicting Edwin H. Armstrong, the inventor of frequency modulation.

This page shows some of the events in the early history of FM broadcasting in the United States. Note that apex stations referred to on this page used amplitude modulation on VHF frequencies; many of them evolved into FM stations. For dates involving the earliest stations, see also the "earliest FM stations" page at this website. Thanks to Bob Carpenter, Winston Tharp, Donna Halper, Steve Reggie, and Robert W. Paine, who assisted with this page. The page is maintained by Jeff Miller. Suggestions are welcome.

Last revision: Aug. 31, 2002

Call letter sequences of some stations mentioned on this page

W1XER/W39B/WMTW/WMNE Boston (Mount Washington)
 W1XK/W67B/WBZ-FM Boston
 W1XOJ/W43B/WGTR Paxton, Mass.
 W1XPW/W65H/WDRC-FM/WFMQ/WHCN Meriden (later Hartford)
 W1XSN/W81SP/WBZA-FM Springfield, Mass.
 W1XSO/W53H/WTIC-FM Hartford
 W1XTG/WTAG-FM Worcester
 W2XDA Schenectady & W2XOY New Scotland (later Albany). W57A/WGFM/WGY-FM/WRVE Schenectady
 W2XMN/WFMN/KE2XCC Alpine, N. J.
 W2XOR/W71NY/WOR-FM/WBAM/WOR-FM/WXLO/WRKS New York
 W2XQR/WQXQ/WQXR-FM/WQXR New York
 W2XWG/W51NY/WEAF-FM/WNBC-FM/WRCA-FM/WNBC-FM/WNWS-FM/WYNY et. al. New York
 W3XO Washington D. C. may be linked to WINX-FM/WTOP-FM/WHUR
 W4XA/W47NV/WSM-FM Nashville
 W8XAD/W43R/WHEF/WHEC-FM Rochester
 W8XVB/W51R/WHFM/WZKC/WKLX/WBBF-FM Rochester
 W8XVH/W45CM/WELD Columbus, Ohio
 W9XAO/W55M/WFMF/WTMJ-FM Milwaukee
 W9XEN/W51C/WWZR/WEFM/WUSN Chicago
 W9XYH/WDUL/WEBC-FM Superior, Wis.

1921. The term *wave-length modulation* appears in *Thermionic Tubes* by J. Scott-Taggart.

Feb. 1922. A paper "Notes on the Theory of Modulation" by J. R. Carson appearing in the *Proceedings of the Institute of Radio Engineers* contains the earliest known use of the term "frequency modulation": "It has been proposed..to employ an apparently radically different system of modulation which may be termed frequency modulation as distinguished from amplitude modulation, in the belief that the former system makes possible the transmission of signals by a narrower range of transmitted frequencies." The paper shows that the bandwidth required for frequency modulation is at least twice the highest modulating frequency. The paper concludes that "this method of modulation inherently distorts without any compensating advantages whatsoever."

Winter 1933-34. Armstrong demonstrates frequency modulation to executives and engineers of RCA.

Dec. 19, 1933. According to *Famous First Facts*:

1st FACSIMILE BROADCAST IN ULTRA-HIGH FREQUENCIES was made December 19, 1933, by station W9XAF, Milwaukee, Wis., on frequencies of 42,000-56,000 kilocycles and 60,000-86,000 kilocycles.

The station was not using frequency modulation.

May 1934. Edwin Armstrong begins testing at the Empire State Building.

June 16, 1934. First test conducted of Armstrong's W2XF on 41 MHz from the Empire State Building, with RCA's cooperation. He transmitted using both amplitude modulation and frequency modulation.

April 1935. Armstrong receives a message from Sarnoff telling him to remove his FM equipment from the Empire State Building. [According to one source, testing continued there until October.]

Summer 1935. Armstrong rebuilds W2AG Yonkers (Carman R. Runyon Jr.) to operate on 110 MHz.

Nov. 5, 1935. Armstrong demonstrates reception of W2AG at a meeting of the Institute of Radio Engineers 17 miles from the station. The ID for the transmission was, "This is amateur station W2AG at Yonkers, New York, operating on frequency modulation at two and a half meters."

May 1936. Armstrong's paper "A Method of Reducing Disturbances in Radio Signaling by a System of Frequency Modulation" appears in the *Proceedings of the Institute of Radio Engineers*.

June 1936. Armstrong describes his FM system at FCC hearings; critics predict the system is impractical.

July 1936. Armstrong granted experimental license for FM station.

Jan. 1, 1937. *Broadcasting* reports apex station W9XAZ Milwaukee (Milwaukee Journal) has become, as far as is known, the first apex station to originate its own programs on a regular schedule. Station operates on 26.4 MHz.

Mar. 2, 1937. The FCC authorizes two new apex stations, to WCHS Charleston WV, for the 26 MHz band, and to KGFJ Los Angeles, in the 88, 120, 240, and 500 MHz bands. These are the first apex authorizations since Jan. 21, 1936.

Mar. 9, 1937. The FCC authorizes an apex station to General Electric in Albany on 31.6 to 41.0 MHz.

Spring 1937. Shepard applies for a permit for a 50-kW FM station in Paxton.

Aug. 18, 1937. According to *Famous First Facts*:

1st FREQUENCY MODULATION (FM) CONSTRUCTION PERMIT was granted to W1XOJ, the Yankee Network, Inc., Paxton, Mass.

Oct. 18, 1937. The FCC makes public its allocation plan for VHF: 75 channels with 40 kHz separation on 41.02 to 43.98 MHz for apex stations and 16 channels in 30-40 MHz for relay stations

Late 1938. W1XPW Meriden (WDRC, Inc.) is authorized experimental operation on 40.3 MHz. (In 1936, W1XSL Meriden CT had been licensed as an amplitude modulation apex station.)

Jan. 27, 1938. FCC announces its allocation of 25 channels with 40 kHz separation from 41.02 to 41.98 for use by educational stations. Stations are to use amplitude modulation unless a need for FM can be shown.

Jan. 15, 1938. *Broadcasting* reports Yankee Network starts construction of a 50 kw FM station atop Mt. Washington and that Armstrong is building a 50 kw FM station at Alpine NJ.

Apr. 10, 1938. Edwin H. Armstrong's W2XMN carrier is turned on for the first time, 43.7 MHz, 600 watts. For more information on W2XMN, see the [E. H. Armstrong website](#).

Oct. 1938. Construction of W1XOJ begins.

Nov. 1938. WNYE New York goes on the air, using amplitude modulation.

Nov. 21, 1938. WBOE Cleveland is licensed for 500 watts on 41.5 MHz, using amplitude modulation. According to the 1961-62 *Broadcasting Yearbook*, the station went on the air in Oct. 1938.

Late 1938. W1XER moves its transmitter from Quincy to Mount Washington and begins operation on 42.3 MHz, using amplitude modulation.

Jan. 5, 1939. Apex station W8XNU Cincinnati (Crosley) begins a regular schedule of daily broadcasts, on 25.95 MHz with 1000 watts.

Jan. 11, 1939. FCC engineers listen to Armstrong's FM station from Sayville, New Jersey, 50 miles from the transmitter site. The station was operating on 42.8 MHz with 20 kw. They also listen to FM station W2AG Yonkers, operating on 110 MHz with 500 watts.

Feb. 1, 1939. *Broadcasting* reports General Electric engineers recently set up two experimental frequency modulation transmitters at Albany and Schenectady, operating on the same frequency. They drove a test car between the two cities and found almost no areas of interference between the stations. The stations were W2XDA Schenectady and W2XOY New Scotland.

Feb. 1, 1939. *Broadcasting* reports that the FCC feels that tests using frequency modulation should be expedited before apex broadcasters, using amplitude modulation, become entrenched. It reports about a dozen apex stations are licensed, and that several are receiving highly satisfactory results, notably WWJ, WKY, and WBEN.

Feb. 1, 1939. *Broadcasting* reports Professor Daniel Noble of Connecticut State College is experimenting with FM in the 100 MHz band.

Mar. 23, 1939. Armstrong demonstrates reception of his 20 kw FM transmitter at Alpine and a 600-watt transmitter at Yonkers to the Radio Club of America at Columbia University.

April 1939. Apex station W4XA Nashville begins a regular schedule of programs on 26.15 MHz.

May 13, 1939. W1XPW Meriden (WDRC, Inc.) begins on-air testing from its site atop Meriden Mountain. Station operates with 2 kw, awaiting higher power transmitter.

May 26, 1939. John Shepard in conjunction with the Institute of Radio Engineers demonstrates FM at Northeastern University for several hundred college professors, engineers, scientists, and technicians.

May 27, 1939. W1XOJ Paxton (Yankee Network) goes on the air on 43.0 MHz with 2000 watts. (To relay programming the Boston studios of the Yankee Network to Paxton, W1XOK on 133.03 MHz with 250 watts was used. Donna Halper reports this station appears to have become WEOD and then disappeared completely.)

June 1939. WTMJ applies for CP for experimental FM station

June 1, 1939. *Broadcasting* article lists stations using Armstrong modulation now in operation or under construction:

- Alpine, N. J. (Maj. E. H. Armstrong) 20-40 kw (in experimental operation)
- Washington, D. C. (Jansky & Bailey) 1 kw
- Mt. Washington, N. H. (Yankee Network) 2 kw
- New York, N. Y. (J. V. L. Hogan) 1 kw
- Storrs, Conn. (D. A. Noble) 100 w
- Rochester, N. Y. (Stromberg-Carlson) 2 kw (CP applied for)
- Meriden, Conn. (F. M. Doolittle) 1 kw
- Schenectady, N. Y. (General Electric) 10 kw
- Pittsburgh, Pa. (Westinghouse) 10 kw
- Springfield, Mass. (Westinghouse) 1 kw
- Paxton, Mass. (Yankee Network) 50 kw (in experimental operation)
- Yonkers, N. Y. (C. R. Runyon) 500 w (in experimental operation)

July 18, 1939. First day of regular programming for W2XMN Alpine (Armstrong), 42.8 MHz, 35,000 watts. The following is taken from *Rebel In Radio* by Elliott M. Sanger:

On July 18, 1939, Armstrong's transmitter carried the world's first regularly scheduled program on FM radio. The entire program originated from WQXR's studios in New York City. The telephone company had installed a special high-fidelity telephone line to carry the program from the WQXR studios to W2XMN in Alpine, New Jersey. (The first two selections were Tchaikovsky's "Haydn's Symphony No. 100" and "Francesca da Rimini.") Not too many people could listen, however, for there were just 25 FM receivers in the world. But those who did listen agreed that a revolution in radio broadcasting had taken place.

July 24, 1939. W1XOJ Paxton begins a regular schedule of 16 hours a day on the air, on 43.0 MHz. The station is still using 2000 watts but later will increase to 50 kw.

Aug 1, 1939. *Broadcasting* reports there are four groups of frequencies for FM:

- in the C group are 26.3, 26.5, 26.7, 26.9
- in the E group are 42.6 42.8 43.0 43.2 43.4
- in the G group are 117.19 117.43 117.67 117.91
- in the H group are any frequencies above 300 MHz except 400-401 MHz

Broadcasting also reports there are four stations currently in operation with Armstrong modulation: Armstrong at Alpine, General Electric at Schenectady, W1XPW Meriden (WDRC), and W1XOJ. It reports construction permits have been issued to:

- Paul Godley, consulting engineer, for a station at Alpine
- C. M. Jansky, consulting engineer, for a station in Washington
- John V. L. Hogan (WQXR) for a station at Long Island City
- Westinghouse (WBZ-WBZA) for a station at Springfield
- Head of the Lakes Broadcasting Co. (WEBC) for a station at Duluth, Minn. (which currently operates apex station W9XJL, 250 watts, which will be revamped for FM with 1000 watts on 26.3 MHz)

And it reports that applications for construction permits are

- Traveler Co., Hartford (WTIC)
- Stromberg-Carlson Co., Rochester (WHAM)
- *Milwaukee Journal* (WTMJ)
- *Worcester Telegram* (WTAG)

Aug. 29, 1939. W1XSN Springfield begins some experimental broadcasts, according to notes from Gordon Swan [Donna Halper provided this information].

Sept. 1939. W3XO Washington is placed into operation, with 1000 watts on 43.2 MHz, according to *Broadcasting* of

Nov. 1, 1939, which reports Jansky & Bailey "are experimenting with it regularly."

Oct. 15, 1939. *Broadcasting* reports WOR was recently authorized an FM station on 43.3 MHz with 1000 watts, and that it will use the call W2XWI.

Oct. 15, 1939. The abbreviation "F-M" makes its (apparent) first appearance in *Broadcasting* magazine. Beginning with the March 15, 1940, issue, the abbreviation is changed to "FM."

Nov. 1, 1939. *Broadcasting* reports, "The Commission on Oct. 24 also authorized W2XAG, F-M station at Yonkers, N. Y., operated by Carman R. Runyon Jr., pioneer experimenter with the system, to change to the high-frequency classification and to operate with 5,000 watts on 117.19 mc."

Nov. 8, 1939. W2XQR New York (John V. L. Hogan) begins broadcasting, on 43.2. The following is taken from *Rebel In Radio* by Elliott M. Sanger:

The station had applied for an FCC license to broadcast in the then new high fidelity FM band, and went on the air in November 1939, with call sign W2XQR - the first FM station in the world (barring the experimental W2XMN of Armstrong). Major Armstrong lent the station his FM transmitter which was promptly installed at 42nd Street and Lexington Avenue, atop the 54 story Chanin Building. It stayed there until the station moved to the Empire State building in December 1965.

Nov. 11, 1939. The start date for W8XVB Rochester (Stromberg-Carlson Co.), according to the 1946 *Broadcasting Yearbook*.

Dec. 3, 1939. Experimental FM relay broadcast is successful: W2XCR Yonkers broadcast a special program which was picked up by W2XMN Alpine, which relayed it to W2XPW Meriden. It was then received at the WDRC studios.

Dec. 19, 1939. FCC press release addresses issue of commercial FM licensing

Jan. 1940. NBC begins regular FM transmission from Empire State Building on W2XDG, 42.6

Jan. 4 and 5, 1940. Experimental FM relay broadcasts: W2XCR Yonkers to W2XMN Alpine to W1XPW Meriden CT to Worcester to W1XOJ Paxton MA to W1XOY at Mt. Washington to Boston AM station.

Jan. 15, 1940. W9XAO Milwaukee (The Journal Co.) begins tests on 45.5, claiming to be the first FM west of Alleghenies and fifth FM in U. S.

Feb. 2, 1940. Start date for W9XEN Chicago (Zenith).

Feb. 1940. Start date for WXAD Rochester (WHEC, Inc.).

Feb. 5, 1940. Start date for W1XSO Hartford (Travelers Broadcasting Service Corp.).

Feb. 23, 1940. W9XAO Milwaukee begins a regular program schedule.

Feb. 28, 1940. W2XOR New York (Bamberger Broadcasting Service) starts regular broadcasting under a special temporary authorization

Mar. 3, 1940. *New York Times* reports that with the introduction this month of W2XOR, there are now three frequency modulation stations in the area: W2XOR, on 43.4, with programs of the Mutual Broadcasting System; W2XMN on 42.8, which is on the air Mondays through Fridays from 4 to 11 p.m., with programs of the Columbia Broadcasting System; and W2XQR on 43.4, which broadcasts daily from 5 to 10 p.m. [The article shows two stations on the same frequency; this may be an error.]

Mar. 15, 1940. *Broadcasting* lists the status of FM stations as of March 13.

FM STATIONS LICENSED AND OPERATING

Location	Call	Licensee	Watts	Kc.
N. of Alpine, N. J.	W2XMN	Edwin H. Armstrong	40,000	42800 117430
New York City	W2XOR	Bamberger Bcstg. Service (WOR)	1,000	43400
Schenectady, N. Y.	W2XDA	General Electric Co. (WGY)	50	43200
New Scotland, N. Y.	W2XOY	General Electric Co. (WGY)	150	43200
New York City	W2XQR	John V. L. Hogan (WQXR)	1,000	43200
Washington, D. C.	W3XO	Jansky & Bailey	1,000	43200
Milwaukee, Wis.	W9XAO	The Journal Co. (WTMJ)	1,000	42600
New York City	W2XWG	National Broadcasting Co. (WEAF)	1,000	42600
Yonkers, N. Y.	W2XAG	Carman R. Runyon, Jr.	5,000	117190
Hartford, Conn.	W1XPW	WDRC, Inc.	1,000	43400
Rochester, N. Y.	W8XVB	Stromberg-Carlson Co. (WHAM)	1,000	43200
Hartford, Conn.	W1XSO	Travelers Bcstg. Service Corp. (WTIC)	1,000	43200
Springfield, Mass.	W1XSN	Westinghouse E. & M. Co. (WBZA)	1,000	42600
Columbus, O.	W8XVH	WBNS, Inc.	250	43000
Rochester, N. Y.	W8XAD	WREC, Inc.	1,000	42600
Chicago, Ill.	W9XEN	Zenith Radio Corp.	1,000	42800

FM STATIONS AUTHORIZED FOR CONSTRUCTION

Location	Call	Licensee	Watts	Kc.
Superior, Wis.	W9XYH	Head of the Lakes Bcstg. Co. (WEBC)	1,000	43000
Bethesda, Md.	W3XMC	McNary & Chambers	100	42600
Boston, Mass.	W1XK	Westinghouse E. & M. Co. (WBZ)	1,000	42600
Worcester, Mass.	W1XTG	Worcester Telegram Pub. Co. (WTAG)	1,000	43400
Boston, Mass.	W1XOJ	Yankee Network	50,000	43000
Cincinnati, O.	...	The Crosley Corp. (WLW)	1,000	43200

(Bob Carpenter believes W3XMC never went on the air.)

Mar. 15, 1940. W9XYH Superior, Wis., begins daily broadcasting, the farthest west FM station.

Mar. 18, 1940. FCC FM hearings begin

Mar. 29, 1940. Start date for W8XVH Columbus (WBNS, Inc.) 43.0 MHz.

May 20, 1940. FCC authorizes commercial FM effective July 1, 1940, on 42-50 MHz. However, the authorization is later rescinded.

June 15, 1940. *Broadcasting* reports educational stations licensed to date for amplitude modulation are WBOE Cleveland and WNYE New York, and that WBKY Beattyville, Ky., has a construction permit. "It is presumed that these, along with all other future applicants, will change to FM."

June 15, 1940. *Broadcasting* reports W2XWG is operating from 4 to 11 p.m. on Tuesdays through Saturdays on 42.6 MHz.

June 17, 1940. Start date for W1XTG Worcester (Telegram Publishing Co.).

Aug. 1, 1940. W2XOR (Bamberger Broadcasting Service) begins operation as New York's first fulltime FM station, operating 15 hours daily on 43.4 MHz with 1000 watts.

Aug. 4, 1940. *New York Times* reports on New York FM stations:

- 42.6 W2XWG operates Monday through Friday 3 p.m. to 11 p.m. experimentally
- 42.8 W2XMN operates daily 4 p.m. to 11 p.m.
- 43.2 W2XQR operates daily 4 p.m. to 10 p.m.
- 43.4 W2XOR operates daily 9 a.m. to midnight

Aug. 15, 1940. The Board of Education of the San Francisco Unified School District is granted a CP for 1,000 watts on 42.1. The station will use frequency modulation.

Sept. 1940. W1XPW begins a regular program schedule

Sept. 1, 1940. *Broadcasting* reports educational station WBOE Cleveland has requested authority to relinquish its 41.5 MHz AM operation and change to FM operation on 42.5 MHz.

Sept. 4, 1940. *Variety* reports, "WDRC is divorcing itself from its offspring FM station, W1XPW, putting same officially on its own two feet Monday [as of September 16, 1940]. At that time, W1XPW will become a separate entity, broadcasting its own programming and maintaining its own staff. Believed to be the only FM in the country to maintain its own set-up, it will operate at the start on a 12-hour a day basis." The article also said that W1XPW had been "in operation with 1000 watts power for about a year," and had applied to the FCC for a boost to 50,000 watts [Donna Halper].

Oct. 2, 1940. FCC adopts rules changes assigning frequencies with 200 kHz separation for FM broadcasting:

- For rural areas: 43.1-44.3
- For cities with population greater than 25,000: 44.5-48.7
- For cities with population less than 25,000: 48.9-49.9

[Some nice photos of FM radios which tuned to the 42-50 MHz band are available at <http://www.geocities.com/CapeCanaveral/9178/radios/fm45.html>.

More photos of FM only radios, although not quite as old, are available at http://www.somerset.net/arm/fm_only.html.]

Oct. 17, 1940. WBKY Beattyville, Ky., goes on the air at 7:30 p.m. on 42.9 MHz with 100 watts [This station probably used amplitude modulation.]

Oct. 31, 1940. FCC grants 15 stations the first construction permits for commercial FM operation:

- Detroit, Evening News Assn. (WWJ), 44.5 mc.; 6,820 sq. mi.; 2,498,000 population.
- Los Angeles, Don Lee, 44.5 mc.; 6,944 sq. mi.; 2,600,000 population.
- Schenectady, Capitol Broadcasting Co. Inc., 44.7 mc.; 6,944 sq. mi.; 967,700 population.
- New York, Marcus Loew Booking Agency (WHN); 46.3 mc.; 8,500 sq. mi.; 12,000,000 population.
- New York, NBC; 45.1 mc.; 8,500 sq. mi.; 12,000,000 population.
- New York, W. G. H. Finch; 45.5 mc.; 8,500 sq. mi.; 12,000,000 population.
- Brooklyn, N. Y., Frequency Broadcasting Corp., 45.9 mc.; 8,500 sq. mi.; 12,000,000 population.
- Evansville, Ind., Evansville On the Air Inc. (WEOA-WGBF); 44.5 mc.; 8,397 sq. mi.; 465,000 population.
- Mt. Washington, N. H., Yankee Network; 43.9 mc.; 31,000 sq. mi.; 2,000,000 population.
- Binghamton, N. Y., Howitt-Wood Radio Co. (WNBF); 44.9 mc.; 6,500 sq. mi.; 256,300 population.

- Baton Rouge, La., Baton Rouge Broadcasting Co. (WJBO); 44.5 mc.; 8,100 sq. mi.; 361,400 population.
- Columbus, O., WBNS Inc.; 44.5 mc.; 12,400 sq. mi.; 1,100,000 population.
- Salt Lake City, Radio Service Corp. of Utah (KSL); 44.7 mc.; 623 sq. mi.; 194,000 population.
- Chicago, Zenith Radio Corp.; 45.1 mc.; 10,760 sq. mi.; 4,500,000 population.
- Milwaukee Journal Co. (WTMJ); 45.5 mc.; 8,540 sq. mi.; 1,522,000 population.

Nov. 20, 1940. W2XOY Schenectady (General Electric Co.) begins transmitting on a regular schedule, according to an article in *FM* in January 1941.

Dec. 6, 1940. W1XK licensed for experimental operation (information provided by Donna Halper, from Gordon Swan's notes).

Dec. 8, 1940. The first advertising contract for FM broadcasts was signed by the Longines Watch Company and provided for the broadcasting of Longines time signals by W2XOR, New York, for 26 weeks beginning January 1, 1941. [Dec. 8 is the date from *Famous First Facts*; according to *Broadcasting* the date was Dec. 9.]

Dec. 18, 1940. W1XER Boston (Yankee Network) goes on the air as an FM station with 1 kw, transmitting from Mount Washington, according to Donna Halper. This station had previously been a 500-watt weather bureau station (W1XOY), which John Shepard converted to his second FM station.

Jan. 1, 1941. Commercial FM broadcasting is authorized to begin on this date on 42 to 50 MHz (although five frequencies are reserved for educational broadcasting).

Jan. 1, 1941. *New York Times* lists: 42.8 W2XMN; 43.5 W2XOR; 43.2 W2XQR

Jan. 14, 1941. W2XMN discontinues rebroadcasting programming of CBS, which plans its own New York FM station. W2XMN arranges a regular daily schedule of 10 hours of recorded music originating from the Associated Recording Studios.

Jan. 15, 1941. W1XOJ increases power to 50,000 watts.

Feb. 1941. Non-commercial WBOE Cleveland OH becomes an FM station.

Mar. 1, 1941. W47NV Nashville becomes the first station to be licensed for commercial operation, on 44.7 MHz with 20 kw. This station went off the air in 1951. [As stations are licensed for commercial operation, their calls are changed to a new alphanumeric system which indicates the frequency and location.]

Mar. 1, 1941. *New York Times* lists: W2XMN 42.8, W2XQR 43.2, W2XOR 43.5, W2XWG 45.1

Mar. 10, 1941. KALW is licensed to the San Francisco Unified School District, the first FM station in the western U. S.

Apr. 1, 1941. W2XOR license replaced with commercial license W71NY 47.1

Apr. 29, 1941. W1XOJ Paxton MA call changed to W43B

May 26, 1941. The first commercials exclusively for FM, for the Socony-Vacuum Oil Co., are broadcast over W43B and W39B.

July 1, 1941. *New York Times* lists: 42.8 W2XMN; 47.1 W71NY; 48.7 W2XQR.

Sept. 1, 1941. KALW broadcasts its first program, "Schoolcast," after 30 days of experimentation, according to Mullany, George G., "San Francisco Experiment in Radio Education," *California Journal of Secondary Education*, Oct. 1941, pp. 336-9.

Sept. 5, 1941. W75C Chicago (Moody Bible Institute) is authorized to operate on 47.5 MHz with a power of 1000 watts,

using a Western Electric 503-1 transmitter [according to a document with this date seen by Bob Caithamer, Director of Engineering for Moody Broadcasting].

Oct. 12, 1941. *New York Times* lists: 42.8 W2XMN, 45.1 W2XWG, 47.1 W71NY, 48.7 W2XQR

Nov. 3, 1941. WCAU-FM begins transmissions, according to a WCAU memo dated August 2, 1946 from George Lewis, Assistant Chief Engineer. [Call letters were probably W69PH at the time.]

Dec. 8, 1941. *Time* reports first FM net: W71NY New York, W2XMN Alpine, W53PH Philadelphia, W65H Hartford, W43B near Boston, W39B Mt. Washington, W47A Schenectady

Feb. 1942. *FM* magazine reports, "K45LA, Los Angeles, Don Lee station on 1,700-ft. Mt. Lee gets its programs over a 4-mile, 15,000-cycle line from the Hollywood Studios. Western Electric transmitter puts 1 kw. into the Lingo antenna shown here. Power will be increased later. Meanwhile, listeners from San Diego to Ventura are becoming FM program enthusiasts. Station is programmed independently, taking only high spots from Mutual and Don Lee nets.

Feb. 1942 *FM* magazine reports: "There are now 29 FM broadcast stations on the air with daily schedules. They are distributed as follows: Baton Rouge, 1; Boston, 1; Columbus, 1; Evansville, 1; Los Angeles, 1; Milwaukee, 1; Mt. Washington, 1; Nashville, 1; Rochester, 1; Detroit, 2; Hartford, 2; Philadelphia, 2; Pittsburgh, 2; Schenectady, 2; Chicago, 4; New York City, 6."

Feb. 1942. *FM* magazine reports, "Metropolitan Television, Inc., affiliated with Bloomingdale's department store, has been granted an extension until June 30, 1942, to complete construction of W75NY."

Feb. 1942. *FM* magazine reports, "An FM CP has just been issued to Amarillo Broadcasting Corporation for 45.1 mc. This application has been pending for many months."

Feb. 1942. *FM* magazine reports, "FM application of American Network has been designated for a consolidated hearing which will include seven applicants in the New York area."

Feb. 1942. *FM* magazine reports, "W53PH, operated by WFIL, put its full-power transmitter on the air February 10th. This is a 10-kw. R. E. L. installation. FM studios are in the Widener Building.

Feb. 1942. *FM* magazine reports, "Leonard Ash, president of Capitol Broadcasting Company, Inc., has straightened us out on the ST link situation. Yankee Network's link transmitter operating on 133.03 mc., was the first FM type to be installed. However, Capitol's transmitter was the first to be put into commercial service in the new 331 mc. band. It operates over an airline distance of 12 miles."

Feb. 1942. *FM* magazine reports, "Zenith Radio Corporation, operating W51C, has received a letter from a listener in Monterey, Mexico, telling of daily reception of this station between 3:00 P. M. and 6:00 P. M. This is the greatest distance, 1,100 airline miles, from which consistent reception of the 50 kw. transmitter has been reported."

Mar. 1942. *FM* magazine reports, "The FM end of the GE broadcasts are originating at W47NY, from which they are picked up on W2XMN, and distributed on FM frequencies to W65H, and north to W43B and W39B, to W2XOY and W47A, and to W53PH. The program is transmitted on Tuesdays, Thursdays, and Saturdays at 6:30 to 6:45 p.m. on the FM stations, and at 6:00 to 6:15 P. M. on the 51 CBS stations."

Mar. 1942. *FM* magazine reports, "From this eminence at 500 Fifth Avenue, New York City, CBS is now maintaining a regular FM program schedule. When the antenna is completed, the 3-kw. G. E. transmitter will cover 12,000,000 listeners. Meanwhile, with a temporary antenna, W67NY is putting out a splendid signal, and adding greatly to the entertainment of listeners in the New York area."

Mar. 1942. An article by Arnold Nygren, chief engineer of WFIL-W53PH, Philadelphia, in *FM* magazine, reports that W53PH is using a 10-kw REL type 520 DL transmitter and a 50-foot four-bay Lingo antenna on top of a 250-foot tower on the roof of a 255 foot building. The article also reported that beginning in January 1942 W53PH inaugurated a monthly program booklet, and that over 1,300 subscribers received the February booklet.

Mar. 1, 1942. *New York Times* lists: 42.8 W2XMN, 44.7 W47NY, 45.1 W2XWG, 45.9 W2XQR, 47.1 W71NY.

Aug. 1, 1942. *New York Times* lists: 42.8 W2XMN, 44.7 W47NY, 45.1 W2XWG, 45.9 W2XQR, 46.3 W63NY, 46.7 W67NY, 47.1 W71NY

July 11, 1943. *New York Times* reports W2XQR has changed to W59NY

Sept. 19, 1943. *New York Times* lists: 42.8 W2XMN, 43.9 W39NY, 45.1 W2XWG, 45.9 W59NY, 46.3 W63NY, 47.5 W75NY.

Nov. 1, 1943. The unpopular alphanumeric call system is scrapped and purely alphabetical call letters are adopted; W45CM to WELD, W75C to WDLM, W43B to WGTR, W65H to WDRC-FM, W53H to WTIC-FM, W81SP to WBZA-FM, W67B to WBZ-FM, etc.

Nov. 1, 1943. *New York Times* lists: 42.8 W2XMN, 43.9 WNYC-FM, 45.1 W2XWG, 44.7 WGYN, 45.9 WQXQ, 46.3 WHNF, 46.7 WABC-FM, 47.1 WOR-FM, 47.5 WABF

Jan. 1, 1944. *New York Times* lists: 42.3 W2XMN, 48.9 (sic) WNYC-FM, 44.7 WGYN, 45.9 WQXQ, 46.3 WHNF, 46.7 WABC-FM, 47.1 WBAM, 47.5 WABF

May 10, 1944. *New York Times* lists: 42.3 W2XMN, 43.9 WNYC-FM, 44.7 WGYN, 45.1 W2XWG, 45.9 WQWQ, 46.3 WHNF, 46.7 WABC-FM, 47.1 WBAM, 47.5 WABF

July 22, 1944. W9XEK Louisville goes on the air on 45.5 MHz. The following information was taken from a [WHAS station history page](#):

July 22, 1944	W9XEK went on the air on 45.5MHz
Apr 20, 1947	Program service on WCJT (99.7 MHz) started. Call letters stood for Courier Journal Times. The antenna was at WHAS' Eastwood site.
May 7, 1948	W9XEK taken off the air
May 21, 1948	Authority granted to change call letters of WCJT to WHAS-FM.
Dec 31, 1950	FM license canceled and WHAS-FM goes dark.

Jan. 15, 1945. FCC announces allocations proposals, moving FM to 84-108 MHz, with 84-88 MHz reserved for noncommercial FM broadcasting.

May 21, 1945. FCC announces allocation of spectrum above 25 MHz with exception of 44-108 MHz but delays decision as to placement of FM for propagation studies to be made by FCC and industry engineers. The 44-108 MHz spectrum is to be allocated, following tests, on one of the following three alternatives:

Alternative 1: 44-48 Amateur; 48-50 Facsimile; 50-54 Educational FM broadcasting; 54-68 Commercial FM broadcasting; 68-74 Television; 74-78 Non-Government fixed and mobile aero markers on 75 MHz to remain as long as required; 78-108 Television, fixed, mobile [shared].

Alternative 2: 44-56 Television; 56-60 Amateur [the same as pre-WW2]; 60-66 Television; fixed; mobile [shared]; 66-68 Facsimile; 68-72 Educational FM broadcasting; 72-86 Commercial FM broadcasting; aero markers remain on 75 MHz as long as required; 86-92 Television; 92-104 Television, fixed, mobile [shared]; 104-108 Non-Government fixed and mobile.

Alternative 3: 44-50 Television, fixed, mobile [shared] 50-54 Amateur; 54-78 Television, fixed, mobile [shared] aero markers remain on 75 MHz as long as required; 78-84 Television; 84-88 Educational FM broadcasting; 88-102 Commercial FM broadcasting; 102-104 Facsimile; 104-108 Non-Government fixed and mobile.

Middle 1945. For a three month period in mid-1945, WMFM programs were broadcast on both the regular 45.5 mc channel, and on an experimental channel of 91 mc. with reception compared 80 mi away. (Report submitted Sept. 1945)

June 4, 1945. *Broadcasting* reports FM Broadcasters Association and Television Broadcasters Association ask FCC to allocate: FM 50-54 MHz educational, 54-68 MHz commercial; TV 68-74 MHz and 78-108 MHz

June 27, 1945. FCC allocates 88-108 MHz for FM broadcasting, with 88-92 MHz to be reserved for noncommercial broadcasting, and allocates 106-108 MHz for facsimile broadcasting. Within the 92-106 MHz spectrum, FM stations are to be allocated as follows: 92.1-93.9 community; 94.1-103.9 metro; 104.1-105.9 rural.

Sept. 12, 1945. FCC issues rules for FM broadcasting. Assignments for existing stations in the new band are as follows, with later revisions in parentheses:

Alpine	WFMN	100.9 (98.9)
Baton Rouge	WBRL	96.1
Binghamton	WNBF-FM	96.7 (96.3)
Boston	WBZ-FM	95.7 (100.7)
Chicago	WBBM-FM	99.3
Chicago	WDLM	99.7
Chicago	WEHS	100.1
Chicago	WGNB	98.9
Chicago	WWZR	98.5
Columbus	WELD	94.5
Detroit	WENA	96.9
Detroit	WLOU	96.5
Evansville	WMLL	94.7
Ft. Wayne	WOWO-FM	95.9
Hartford	WDRC-FM	94.3
Hartford	WTIC-FM	93.5
Indianapolis	WABW	94.9
Jersey City	WAAW	96.1 (94.1)
Kansas City	KMBC-FM	97.9
Kansas City	KOZY	99.9
Los Angeles	KHJ-FM	99.7
Los Angeles	KTLO	100.1
Milwaukee	WMFM	92.3
Mt. Washington	WMTW	97.9 (98.1)
Nashville	WSM-FM	100.1
New York	WABC-FM	97.3 (96.9)
New York	WABF	98.5
New York	WBAM	96.9 (96.5)
New York	WEAF-FM	97.7 (97.3)

New York	WFGG	99.7
New York	WGYN	100.1 (96.1)
New York	WHNF	99.3
New York	WNYC-FM	98.1 (94.5)
New York	WQXQ	100.5 (97.7)
Philadelphia	KYW-FM	93.1 (100.3)
Philadelphia	WCAU-FM	95.5 (102.7)
Philadelphia	WFIL-FM	94.3 (103.1)
Philadelphia	WIBG-FM	95.1 (97.1)
Philadelphia	WIP-FM	93.9 (97.5)
Philadelphia	WPEN-FM	95.9 (99.5)
Pittsburgh	KDKA-FM	94.1
Pittsburgh	WTNT	94.5
Rochester	WHFM	98.9
Rochester	WHEF	98.5
Salt Lake City	KSL-FM	100.1
Schenectady	WBCA	95.7 (101.1)
Schenectady	WGFM	95.3 (106.7)
Springfield	WBZA-FM	99.1 (97.1)
Superior	WDUL	92.3
Winston-Salem	WMIT	97.3
Worcester	WGTR	101.7 (103.1)
Worcester	WTAG-FM	102.1 (102.7)

Dec. 24, 1945. *Broadcasting* reports FCC announces tentative allocations plan for FM, providing for over 1500 stations; makes 32 more conditional grants, bringing total to 229

Jan. 10, 1947. On this date 25 FMs are still in the low band.

Jan. 5, 1949. Armstrong obtains temporary restraining order from Washington Circuit Court of Appeals allowing him to stay on 44.1 (brought as a result of July 1946 order eliminating lower FM band)

Apr. 29, 1952. The first multiplex broadcast during regular programming by KE2XCC. A carrier of 25 kHz was used, with a frequency swing of +/- 5 kHz.

Feb. 1, 1954. Edwin Armstrong dies

Mar. 6, 1954. KE2XCC goes off the air. At 7 p.m. the station aired a program in memory of Armstrong; at 8:57 "This is the last program of our 15 years of broadcasting"; Star-Spangled Banner; "As we prepare to pull the switch and shut the station down, we salute the memory of Edwin Howard Armstrong."

Oct. 12, 1955. The first SCA grants are made to WPEN-FM in Philadelphia and WWDC-FM in Washington.

Apr. 24, 1961. *Broadcasting* reports the FCC approves stereo multiplex standards.

June 1, 1961. FM stereo broadcasting is authorized to begin; on this date the FCC received its first notifications of such regular operation, from WEFM Chicago and WGFM Schenectady. Both stations had previously experimented with stereo broadcasting, as had others. [According to Ed Ellers, WGFM was first to broadcast in stereo, as WEFM had to wait an extra hour because of the difference in time zones.]

1962. FCC revises FM rules, dividing the country into three zones (instead of the previous two), creating class A, B, and C stations, and adopting power limits for each class.

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