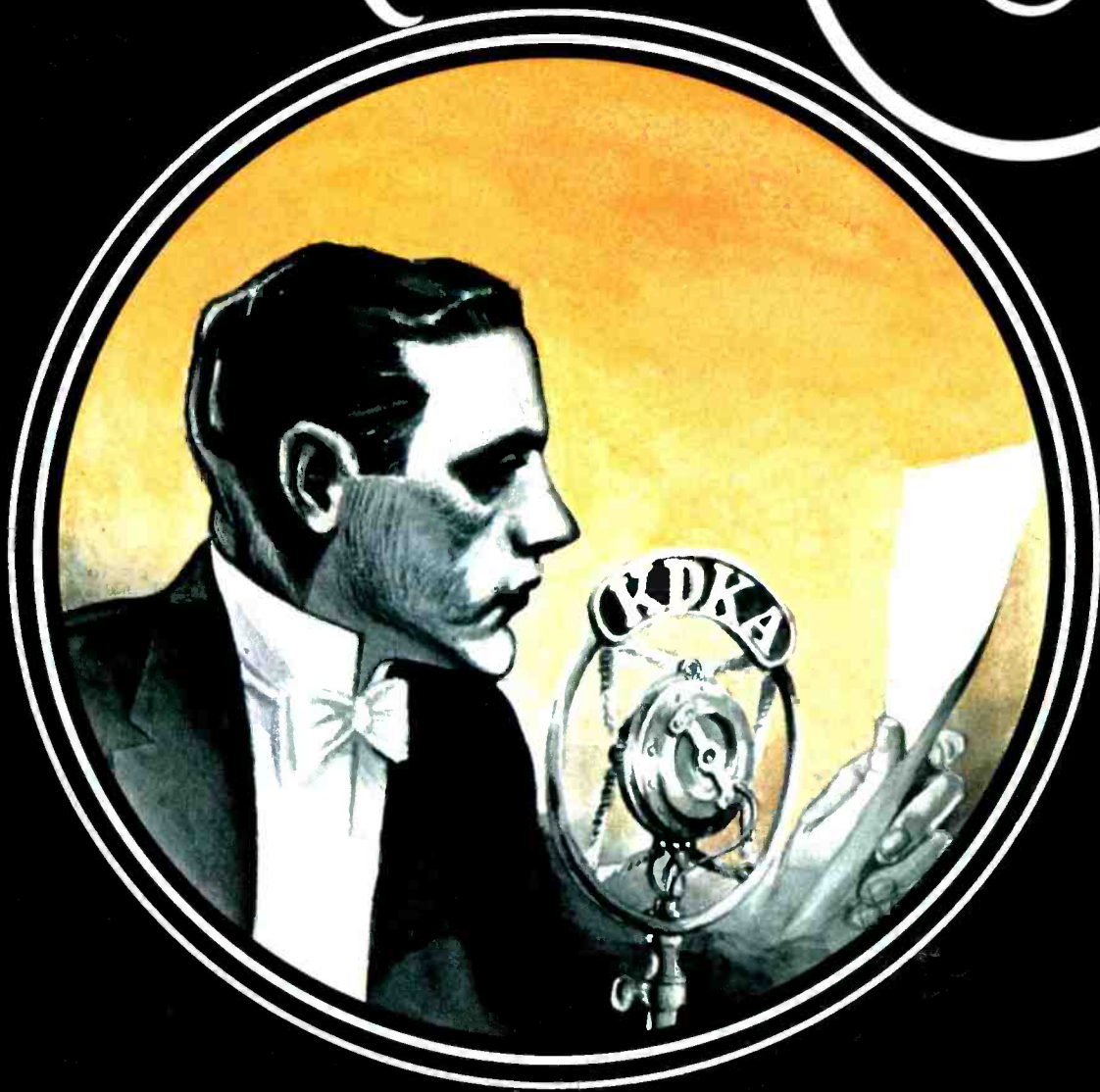


IT STARTED HEAR





126656-A



## The History of KDKA Radio and Broadcasting

### Foreword

Fifty years ago, it was mostly a dream. Today, broadcasting is such an important part of our way of life it is hard to imagine life without it.

The world's first scheduled broadcast was made from Westinghouse's KDKA, the pioneer broadcasting station of the world, in Pittsburgh, Pa., U.S.A. on Nov. 2, 1920.

Much of the early history of KDKA is actually the early history of radio—many of its notable “firsts” are “firsts” for the industry as well.

Establishment of KDKA and presentation of the inaugural broadcast came about as the result of several strange and seemingly unrelated circumstances; among them:

*Westinghouse experience with the vacuum tube while working on World War I radio contracts for the United States and British governments.*

*A \$5.00 bet on the accuracy of a \$12.00 watch.*

*An engineer's determination to save his voice by using phonograph records for amateur radio tests.*

*An alert department store's merchandising initiative.*

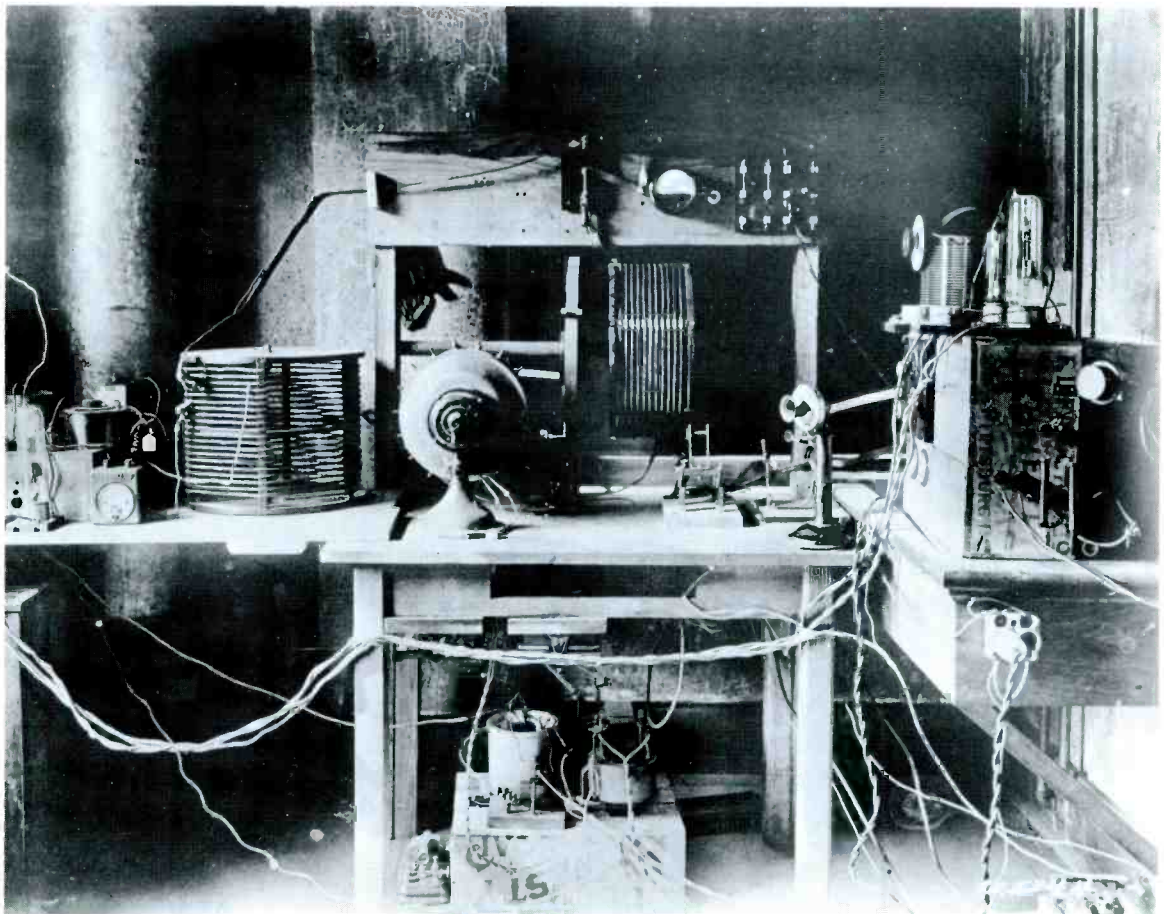
*Foresight of the late H. P. Davis, Westinghouse Vice President during the pioneering days and later Chairman of the Board of the National Broadcasting Company—the man generally credited with being the “Father of Broadcasting.”*

Broadcasting and Westinghouse have come a long way together in the last 50 years. H. P. Davis wrote about broadcasting in January 1922:

“And where will it end? What are the limitations? Who dares to predict? Relays will permit one station to pass its message on to another, and we may easily expect to hear in an outlying farm in Maine some great artist singing into a microphone many thousand miles away. A receiving set in every home; in every hotel room; in every school room; in every hospital room. Why not?”

Indeed, why not? History has supplied the answer.

Dr. Frank Conrad's home in Wilkesburg, Pa. site of his original experiments in radio. The building in the left foreground was the famed garage, where on the second floor Dr. Conrad maintained all his equipment. The telephone pole, which held his antenna is reported to have been cut up and pieces given as desk sets when the house was demolished. Today a plaque marks the site.



### CONRAD'S TRANSMITTER

In the four years before KDKA went on the air in 1920, Dr. Frank Conrad, Assistant Chief Engineer of Westinghouse, used this transmitter to send out radio telephone programs. Located on the second floor of a garage at the rear of his home in Wilkesburg, the transmitter powered Station 8XK — one of the fore-runners of modern radio.



nce  
upon  
a  
time ...

Dr. Frank Conrad, Assistant Chief Engineer of Westinghouse Electric in Pittsburgh first became interested in radio in 1912 when—to settle a \$5 bet on the accuracy of his \$12 watch, made with his friend and co-worker Thomas S. Perkins, manager of Detail and Supply at the Westinghouse East Pittsburgh plant—he had built a small receiver to hear time signals from the Naval Observatory at Arlington, Va. (Dr. Conrad won the bet.)

Fascinated by his new hobby, Dr. Conrad turned next to construction of a transmitter which he installed on the second floor of a garage at the rear of his residence in Wilkinsburg. First official record of this station, licensed **8XK**, appears in the **August 1, 1916**, edition of the Radio Service Bulletin issued monthly by the Bureau of Navigation of the U. S. Department of Commerce, radio licensing agency of that day; and it is from this station that **KDKA** stems and with it, radio broadcasting as it is today.

Security precautions brought cancellation of **8XK** along with all amateur licenses April 7, 1917, one day after the United States entered World War I. However, the station's facilities were used from time to time during the war, under special authorization, to test military radio equipment manufactured by Westinghouse.

### **Dr. Conrad and the World War I Spy Scare**

Earliest result of the Conrad work on war contracts was a revolutionary new type of radio for the U. S. Signal Corps, one of the first vacuum tube wireless sets. This represented a drastic departure from previous design which had depended upon spark-gap transmitters and crystal receivers.

Tests were begun at once using Dr. Conrad's station in Wilkinsburg; and since both transmitting and receiving apparatus required testing, a second station was installed at the East Pittsburgh plant. These tests led, because of war-taut nerves and misunderstanding, to a spy scare, with Dr. Conrad the "villain" in the piece when overzealous neighbors, hearing the tests, set the police on his trail.

The scare was brief, however. When an officer investigated, he learned that Dr. Conrad was that day in the office of the Secretary of the Navy in Washington discussing radio telephone equipment for battleships.

### **Ready-made Audience for KDKA**

As this work progressed other radio developments were undertaken, and as a result, Westinghouse became the first supplier of combination radio telephone-telegraph receivers for the Navy, and a pioneer supplier of ship and shore radio transmitters and airplane receivers.

In May 1919 Westinghouse generators aboard the U. S. Navy seaplane NC-4 provided power for the first continuous over-water plane-to-shore transmitting during this historic flight from Trepassy, Newfoundland—via the Azores and Lisbon—to Plymouth, England.

The amateur ban was lifted Oct. 1, 1919, and the Bureau of Navigation bulletin of May 1, 1920, shows the station relicensed **8XK**.

Removal of the war ban on "ham" stations brought hundreds of new radio fans—their interest whetted by tales of radio's uses during the war by personal wartime experiences—to join the amateurs, building receivers and transmitters and filling the air with their tests and messages.

**HORNE DA**  
The Best Place to Shop After All

...Week Starting Tomorrow  
...Stock Patterns of  
...erware...25% Off

quoted below are for complete sets of smaller sets and single pieces may be sold at the same reductions.

Model No. 1	Price	Model No. 2	Price
...	...	...	...

**The Kiddie-Koop**

...of the Kiddie-Koop...  
...at \$23.00 and \$25.00  
...included

**Folding Chairs**  
...40c Each

**Air Concert**  
"Picked Up"  
By Radio Here

...The music was from a Victrola pulled up close to the transmitter of a wireless telephone in the home of Frank Conrad, Penn and Peebles avenues, Wilkesburg. Mr. Conrad is a wireless enthusiast and "puts on" the wireless concerts periodically for the entertainment of the many people in this district who have wireless sets.



**Air Concert**  
"Picked Up"  
By Radio Here

Victrola music, played into the air over a wireless telephone, was "picked up" by listeners on the wireless receiving station which was recently installed here for patrons interested in wireless experiments. The concert was heard Thursday night about 10 o'clock, and continued 20 minutes. Two orchestra numbers, a soprano solo—which rang particularly high and clear through the air—and a juvenile "talking piece" constituted the program.

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Amateur Wireless Sets, made by the maker of the Set which is in operation in our store, are on sale here \$10.00 up.

--West Basement

This famous ad, placed by the Joseph Horne Co. in the Pittsburgh SUN on Wednesday evening, September 29, 1920, stimulated interest in Dr. Frank Conrad's early radio broadcasts. Dr. Conrad was Assistant Chief Engineer for Westinghouse and supervised the building of KDKA. To Horne's, radios meant a new item for sale. To H. P. Davis, Westinghouse Vice President, the ad was an inspiration. He reasoned that the real radio industry lay in manufactured home receivers and broadcasting programs.

Recognized as one of the leading amateur stations before the war, **8XK**—profiting now by Dr. Conrad's wartime experience—soon became the undisputed leader of amateur broadcasters, and it was to this ready-made audience that **KDKA** made its bow on **Nov. 2, 1920**.

**8XK**'s programs were heard in widely separated locations, and Dr. Conrad was kept busy answering mail—some from fans who merely wished to tell him they had heard his station, others from fellow operators reporting on the quality and strength of his signals. Although the former were welcome, it was the latter which interested Dr. Conrad more because they enabled him to plot the efficiency of his transmitter and plan improvements.

Radio messages, in that early day, were chiefly discussions of the kind of equipment being used and results obtained. Bored by this monotonous routine Dr. Conrad, on **Oct. 17, 1919**, placed his microphone before a phonograph and substituted music for voice. The song was *Old Black Joe*.

### **The Word Broadcast Is First Used**

The music saved Dr. Conrad's voice, but more—it delighted and amazed "hams" all over the country. Mail, heavy previously, now became a deluge with requests that records be played at special times so that the writer might convince some skeptic that music really could be transmitted through space.

Specific requests were played as long as this could be arranged, but so heavy was the demand that within a few days, Dr. Conrad was forced to announce that instead of complying with each individual request, he would *broadcast* records for two hours each Wednesday and Saturday evening. *This is the first recorded use of the word broadcast to describe a radio service.*

These broadcasts soon exhausted Dr. Conrad's supply of records, and the Hamilton Music Store in Wilkinsburg, Pa. offered a continuing supply of records if he would announce that the records could be purchased at the Hamilton store. Dr. Conrad agreed and thus gave the world its first radio advertiser—who promptly found that records played on the air sold better than others.

This two-a-week program schedule was continued with live vocal and instrumental talent added from time to time and with Dr. Conrad's two young sons—Crawford and Francis, who was later Director of Radio for the Western Division of the American Broadcasting Company at Hollywood—acting as radio's original masters of ceremonies.

By late summer of 1920, interest in these broadcasts had become so general that the **Joseph Horne Co.**, a Pittsburgh department store, ran this ad in the **SUN**, Wednesday evening, **Sept. 29, 1920**:

#### **Air Concert "Picked Up" by Radio Here**

*Victrola music, played into the air over a wireless telephone, was "picked up" by listeners on the wireless receiving station which was recently installed here for patrons interested in wireless experiments. The concert was heard Thursday night about 10 o'clock and continued about 20 minutes. Two orchestra numbers, a soprano solo—which rang particularly high and clear through the air—and a juvenile "talking piece" constituted the program.*



### **RADIO'S MOST FAMOUS BROADCAST**

The Harding-Cox election returns on November 2, 1920. This coverage on KDKA Radio, Pittsburgh, gave birth to modern broadcasting, opening a new era in communications. Pictured in this original photo is the first broadcast staff: William Thomas, operator; L. H. Rosenberg, announcer; R. S. McClelland and John Frazier handling telephone lines to the newspaper office. On hand as chief engineer, although this title was not known at the time, was D. G. Little.



*The music was from a victrola pulled close to the transmitter of a wireless telephone in the home of Frank Conrad, Penn and Peebles Avenue, Wilkinsburg. Dr. Conrad is a wireless enthusiast and "puts on" the wireless concerts periodically for the entertainment of the many people in this district who have wireless sets.*

*Amateur Wireless Sets, made by the maker of the set which is in operation in our store, are on sale here \$10.00 up.*

To H. P. Davis, Westinghouse Vice President who had been an ardent follower of the Conrad ventures, the ad was an inspiration. If this was a fair example of popular reaction to Dr. Conrad's broadcasts, the real radio industry lay in the manufacture of home receivers, he reasoned, and in supplying radio programs which would make people want to own such receivers.

Convinced that here was a great new business opportunity, Mr. Davis set about winning other Westinghouse officials to the same view, and so persuasive were his arguments that a station was authorized, license application submitted **Oct. 16, 1920** and election night—then only a little more than two weeks away—selected for the grand opening.

Occasion of the broadcast selected with care to demonstrate the speed and drama of radio was the **Harding-Cox presidential election of 1920**.

Construction of **KDKA**, begun only one month prior to the election, was entrusted to Dr. Conrad. **First KDKA license was issued Oct. 27, 1920**, and call letters were assigned from a roster maintained to provide identification for ships and marine shore stations, these being the only regular radio services then in operation under formal license by the Federal Government. KDKA was located at 360 meters.

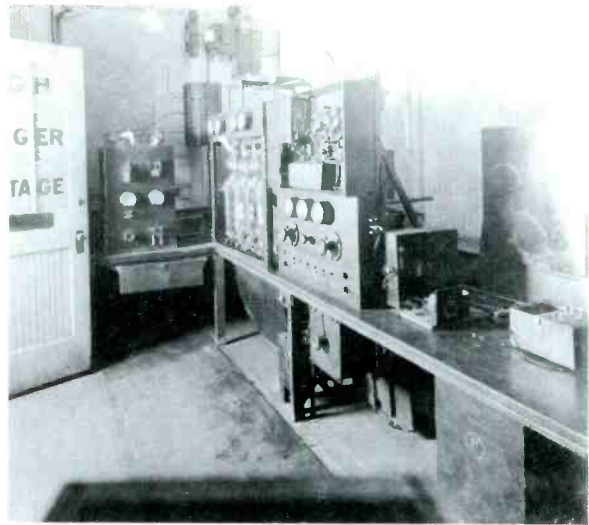
## **Newspaper Provides Returns by Telephone**

Assisting Dr. Conrad was his long-time friend and co-worker, D. G. Little, former Kalamazoo (Mich.) radio "ham." Mr. Little had been tinkering with vacuum tube radio as early as 1910 and had come to Westinghouse after association with the Company and Dr. Conrad on government work while in the Signal Corps during World War I.

Arrangements were made with the morning **Pittsburgh POST**, to secure election returns by telephone. To increase audience, the late D. L. W. Chubb—then manager of the Radio Engineering Department and one of the little band of pioneers—was delegated to install a receiver and loudspeaker system, using two horns borrowed for the occasion from the Navy, in the main ballroom of the Edgewood Club, a suburban Pittsburgh community center where many Westinghouse people and other local residents gathered.

The broadcast originated in a tiny, makeshift shack atop one of the Westinghouse manufacturing buildings at East Pittsburgh. There was no studio. A single room accommodated transmitting equipment, turntable for records, and the first broadcast staff: William Thomas, operator; L. H. Rosenberg, announcer; and R. S. McClelland and John Frazier handling telephone lines to the newspaper office. First newspaper accounts of the broadcast were written and released by W. W. Rodgers. On hand as chief engineer, although the title was not known at the time, was Mr. Little.

**KDKA Transmitter Room in the early 1920's. This was the original room used to broadcast KDKA's famous Harding-Cox Election results on November 2, 1920. It was located in East Pittsburgh.**



**This early publicity photograph was used to glamorize the use of radio receivers. The people in this photo are enjoying the new excitement of radio on an Aeriola Jr. set developed by Westinghouse.**

Oddly enough, although it was Dr. Conrad's interest, stimulated by the bet on the watch, which had paved the way for **KDKA**, he was not present when the station went on the air. Fearful lest the new equipment fail, he was standing by at his own experimental station, **8XK**, five miles away in Wilkinsburg, ready to carry on in the event of trouble at East Pittsburgh.

Broadcasting began at 6 o'clock election night and continued until noon the following day, even though Candidate Cox, hours earlier, had conceded the election to Senator Harding.

## **Broadcast Huge Success, Causes National Sensation**

Throughout that stormy night, while the usual crowds stood in a driving rain before outdoor bulletin boards to see returns, a fortunate few early radio fans—equipped with crystal sets and earphones—were hearing the same returns in the comfort of their homes.

In addition, between returns and occasional music, they heard this request over and over again: "*Will anyone hearing this broadcast communicate with us, as we are anxious to know how far the broadcast is reaching and how it is being received.*"

The broadcast was a national sensation, acclaimed by newspapers all over the country.

Dr. Chubb's Edgewood Club audience whooped and cheered and phoned the station from time to time demanding "*more news and less music*"; and even after the first flurry of excitement—when **KDKA** had settled down to the regular schedule of programs, which has not been interrupted since that time, mail continued to pour in telling of reception here, there, and everywhere.

One such report came from H. W. Irving, now retired transmitter supervisor at **KDKA**. Working as a merchant marine radio operator assigned to the U. S. Army transport, **ANTIGONE**, he heard the program off the Virginia coast while enroute with troops from Puerto Rico to New York.

Receiving the returns by earphones he hastened to deliver them to the captain expecting them to be posted on the ship's bulletin board for all to see. But the skipper, victim of a "radio" hoax several months before, was dubious and would not permit the returns to be posted.

In order to justify the creation of **KDKA**, it was important that the station have an audience able to receive its broadcasts. Mr. Davis explained the problem in a speech to the Harvard Business School in 1928:

*"A broadcasting station is a rather useless enterprise unless there is someone to listen to it. Here was an innovation, and even though advertised, few then, other than possibly some of the amateurs who had receiving sets, could listen to us. To meet this situation we had a number of simple receiving outfits manufactured. These we distributed among friends and to several of the officers of the company."*

It was this handful of friends and executives who thus made up a major part of radio's earliest listening audiences!

## **KDKA Program Standards Become Model for Industry**

Quick to recognize the seriousness of programming a service so widespread in its coverage and so intimate in its appeal, **KDKA** immediately established a strict system of program control.



### **CHURCH AT HOME**

After making the first regularly scheduled church broadcast, KDKA continued to demonstrate the spiritual role of radio by bringing religion to shut-ins.



### **EARLY TO BED**

Because children (as well as their elders) became early radio fans, KDKA originated the bedtime story November 19, 1921. Many other children's programs were added in the next decade of broadcasting.

These self-imposed regulations have endured without change to the present time and have become a pattern for all broadcasters. They promised:

*To work hand-in-hand with the press.*

*To provide programs of interest and benefit to the greatest number.*

*To avoid monotony.*

*To assign distinctive features regular times for the convenience of listeners.*

*To operate a daily service of regularly scheduled programs.*

First program innovation in keeping with this ambitious plan was presentation of a regular service from Pittsburgh's **Calvary Episcopal Church, Jan. 2, 1921**, two months to the day after **KDKA** came on the air.

This program thus became the world's first regularly scheduled radio church service; it was broadcasting's first remote pickup; and with it Dr. Edwin Jan van Etten—then rector of Calvary, later Dean of the Cathedral Church of St. Paul in Boston—became the original radio preacher

Recalling the broadcast, Dr. van Etten declared: "*All was going well, but on glancing at the choir I discovered strange faces and noted unusual antics.*

*"It was not until later that I learned these were Westinghouse engineers—one a Jewish lad, the other an Irish Catholic—garbed in surplices to make them inconspicuous in the midst of my Protestant Episcopal Church.*

*"Even now, as I think of their presence there, it seems to me that they symbolize the real universality of radio religion."*

Company officials, recognizing the widespread and immediate success of **KDKA** as pacemaker of the new industry, turned at once to consideration of stations at Westinghouse plants in other cities, and by spring 1921 plans were ready for stations at the Newark (N.J.) Works and the Springfield (Mass.) Works.

Service and leadership have been stressed by **KDKA** since those very first days back in 1920.

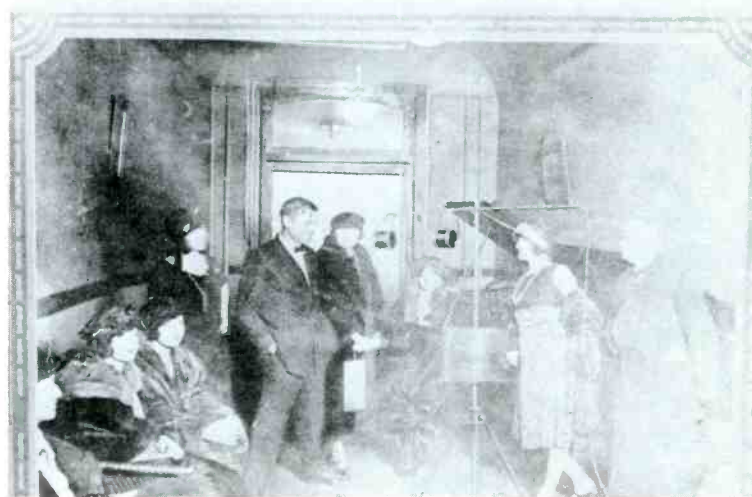
The Newark station, although listed as **WJZ** in the Radio Service Bulletin of **June 1, 1921**, was not licensed until Sept. 30, 1921. It went on the air the following day. Meanwhile, the Springfield station, licensed **WBZ Sept. 5, 1921**, went on the air Sept. 19 with a remote pickup from the Eastern States Exposition at West Springfield. Thus, **WBZ** became the second broadcasting station to offer a regularly scheduled program service. **KDKA, WBZ** and **WJZ** constituted broadcasting's first group of stations under one ownership, and Westinghouse became the first such owner.

**WBZ**, now located in Boston, still is operated by Westinghouse. **WJZ** continued under Westinghouse operation until May 15, 1923, when it became the property of the Radio Corporation of America and later key station of the Blue Network, now the American Broadcasting Company. (The call letters were again acquired by Westinghouse in 1957 when the company purchased a Baltimore television station and renamed it **WJZ-TV**.)



**FIRST FULL-TIME RADIO ANNOUNCER IN THE WORLD**

Harold W. Arlin shown as he looked in the early 1920's. He did the first play-by-play of baseball and football and introduced many noted persons in their radio debuts on KDKA.



Radio and the press worked closely from the very beginning. In an early Pittsburgh Post Studio of KDKA, Will Rogers and a cast from Ziegfeld's Follies made a special broadcast.

## KYW Fourth Westinghouse Station

Armistice Day, 1921, brought opening of the fourth Westinghouse broadcasting station—**KYW** in Chicago—and presentation of radio's first grand opera as a part of that inaugural. Miss Mary Garden introduced the program. **KYW** was located in Chicago until 1935 when it was moved to Philadelphia. In 1955 it was shifted to Cleveland, and in 1965 back to Philadelphia.

## Harold Arlin: Chance Led Him to a Place in History

To meet the demands of its growing program service **KDKA**, in early January 1921, employed the world's first full-time radio announcer. He was Harold W. Arlin, a young electrical engineer—born in La Harpe, Ill.; schooled in Carthage, Mo.; and a graduate of the University of Kansas. He was then working in the Westinghouse offices at East Pittsburgh.

It was just to satisfy his curiosity that Arlin wandered over to inspect the operation of the newly-founded Westinghouse radio station, **KDKA**, in late 1920. He had no idea he was going to become part of history as radio's first regular announcer.

But **KDKA** was looking for an announcer. He applied, and from that moment, almost everything he did on the air became a radio first.

In the early days of **KDKA**, Arlin introduced such celebrities as William Jennings Bryan, Marshall Foch, David Lloyd George, Will Rogers, Lillian Gish, Herbert Hoover and Babe Ruth.

Now retired and living in Mansfield, Ohio, Arlin can look back at radio's first 50 years and reminisce over his role in those early times.

*"The Yankees were playing an exhibition game in Pittsburgh," he recalls, "and to make sure there were no flubs, a speech was written for Babe Ruth to read before the game. When I introduced him, he suddenly got scared and couldn't say a word—mike fright was common in those days—so I grabbed his speech and read it myself. In the meantime, Babe composed himself somewhat and leaned against a wall smoking a cigar while I subbed for him. I received several letters commenting on 'what a wonderful voice Babe Ruth has'."*

He remembers Will Rogers and his great ability to extemporize. One time, on the air, Rogers *"took this copy of the Pittsburgh SUN and talked for 15 minutes in a very humorous vein just from the headlines in the evening paper. I think it was one of the most remarkable demonstrations of extemporaneous wit that I've ever witnessed."*

Arlin, who stayed with radio only five years before going to Mansfield to work for Westinghouse Industrial Relations, spearheaded radio's entry into the sporting world. He delivered the first baseball scores from a studio and then later reported the first professional baseball game.

*"The microphone we used for football broadcasts," says Arlin, "looked like a tomato can with a felt lining. We called it a mushophone."* **KDKA** chose Pitt's opening home game against West Virginia to begin its football coverage and Arlin was chosen to do the play-by-play.

It is the second game, however, that Arlin remembers more vividly—Pitt vs. Nebraska. Both teams were reputed to have excellent teams and everyone was keyed up for the game. After one touchdown Arlin recalls, *"I got a little excited and yelled into the microphone so*

Carried aloft by a big balloon, an experimental antenna is tested in the Pittsburgh area by KDKA Radio personnel.



May 19, 1921 marked the inauguration of one of the most important services ever undertaken by KDKA. Frank Mullen conducted the first pioneer farm report programs from Stockman-Farmer Studio located in East Liberty, Pennsylvania.



*Featured Every Thursday Evening at 6:30 over KDKA*

**DILWORTH'S LITTLE GERMAN BAND** with Schnitzel the dog was directed by Gus Smaltz. The band made regular KDKA Radio performances in the late 1920's.



*loud that it knocked the needle off the modulation meter and we were off the air for several minutes.”*

In 1924 Arlin was voted the **world's most popular announcer**—**KDKA** short-wave broadcasts were heard on several continents—and when he left radio the next year, a British newspaper noted his retirement, calling Harold Arlin of **KDKA**, the Westinghouse station in Pittsburgh, Pa., U.S.A., “**the best known voice in Europe.**”

On January 15, 1921, Herbert Hoover, wartime food administrator and president-to-be, made his first radio address from **KDKA**. The occasion was a speech on behalf of the European Relief Fund at Pittsburgh's Duquesne Club.

February 18, 1921, brought the first remote pickup from a hotel when speeches of Col. Theodore Roosevelt, Jr., and Oklahoma Congresswoman-elect Alice M. Robertson were broadcast from a banquet of the Pittsburgh Press Club in the William Penn Hotel.

### **Harding Inaugural Address Read from KDKA**

On March 4, 1921, **KDKA** scored another first with a broadcast of the inaugural address of Warren G. Harding as he became the 28th President of the United States. A copy of the Harding text was obtained in advance and read on the air while the new President was speaking in Washington.

March 10, 1921, marked the first broadcast from a theater when songs of Miss Ruth Roye, soprano, were picked up from the stage of the Davis Theater in downtown Pittsburgh.

A little more than a week later, on March 19, **KDKA** presented the first in-person radio appearance of a government official of cabinet rank when Secretary of War John W. Weeks, in Pittsburgh for a Chamber of Commerce gathering, made his radio debut. This was also the first broadcast from a public auditorium.

The first collegiate broadcast came April 9, 1921, when proceedings of a meeting of the Pittsburgh Chapter of the Pennsylvania State College Alumni Association, addressed by Penn State Director of Athletics Hugo Bezdek were broadcast.

Two days later, on April 11, 1921, **KDKA** broadcast the first sports event—a 10-round no-decision fight between Johnny Ray and Johnny Dundee in Pittsburgh's Motor Square Garden. First sports announcer was Florent Gibson, Pittsburgh **POST** sports writer who delivered the blow-by-blow description.

First regular broadcasts of baseball scores were introduced on **KDKA** April 13 with the opening of the 1921 major league season. Scores were presented three times—6:05, 7:05, and 8:05—each evening.

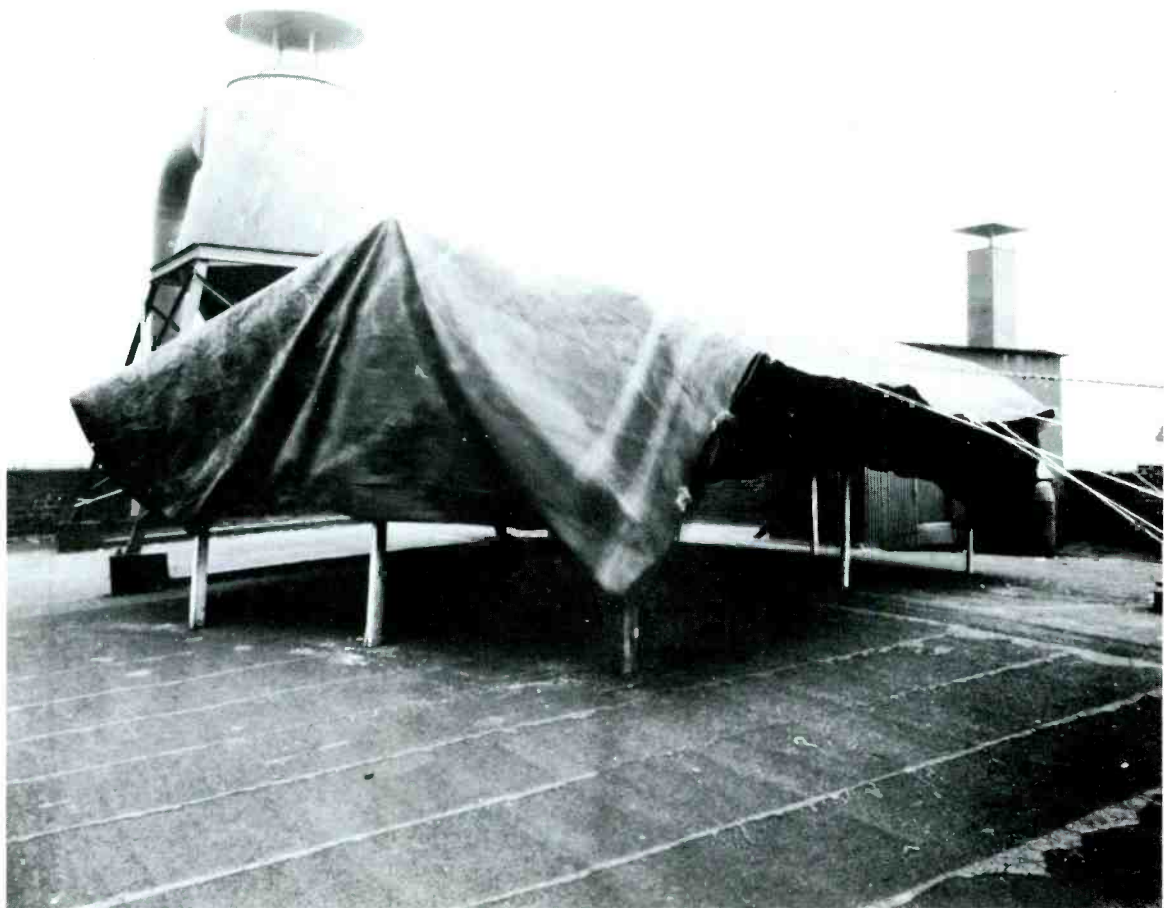
Dr. Van Etten's original church broadcast had demonstrated the spiritual aspects of radio in bringing religious services to shut-ins. On April 17, 1921, the value of broadcasting to pastorless charges was demonstrated in Pittsburgh when services originating in Calvary Episcopal Church were received by radio, amplified and presented by loud-speaker to the congregation of the Herron Hill Presbyterian Church.

### **KDKA Farm Service Launched**

May 19, 1921, marked the inauguration of one of the most important services ever undertaken by **KDKA**. It was on this date that the first government market reports were



Among these early radio receivers was the Aeriola Jr.—the first popular-priced home radio receiver. This set, designed by Westinghouse engineers in 1921 was followed by Aeriola Sr. and the Aeriola Grand—a table-cabinet model which was the fore-runner of today's sets.



KDKA's first studio was this tent atop the Westinghouse K building in East Pittsburgh. It was the cause of some of early radio's "rare" moments, like the whistle of a passing freight train heard nightly at 8:30 PM. A tenor's aria was once abruptly concluded when an insect flew into his mouth. This make-shift studio remained in use until late 1921.

broadcast, thus laying the groundwork for all future farm programs. Prices included: Eggs, 30¢ a dozen; butter, 37½¢ a pound; and potatoes, \$1.75 a bushel.

By the following summer, the demand for additional and more comprehensive farm programs had become so great that on July 1, **KDKA** placed all farm broadcasting under the direction of E. S. Bayard, Pennsylvania editor of the **NATIONAL STOCKMAN AND FARMER** who brought a young Sioux City (Iowa) farm editor East especially to take over this radio work.

That editor was Frank E. Mullen, later executive vice president of the National Broadcasting Company.

Under Mr. Mullen's direction, the **KDKA** Farm Service introduced many news features, among them cotton quotations, added at the insistence of listeners in the deep South; and a regular schedule of recipes and homemaking hints for farm wives, forerunner of the Farm and Home Hour.

In August 1923, a special microphone was installed in Mr. Mullen's offices in the East Liberty section of Pittsburgh as a convenience in handling these programs; and the following January it was moved to the magazine's adjoining auditorium from which location the nearby New Texas (Pa.) Grange shortly thereafter presented radio's first barn dance.

### **KDKA's First Studio Is Tent on Factory Roof**

For the first six months of its existence, **KDKA** was a radio station without a studio. There had been little need for one, since all programs were originated either as phonograph records played on turntables in the tiny transmitter penthouse atop the East Pittsburgh plant; or from churches, theaters, hotels, or other remote points.

However, in mid-May, 1921, it was decided that the program structure should include live band and orchestral talent as well as recordings and the services of several excellent musical organizations of Westinghouse employees were secured. First programs were broadcast from an auditorium at the plant, but room resonance was so great that engineers immediately set about finding other facilities.

As an experiment they pitched a tent on the roof next to their transmitter-penthouse. This tent-studio served admirably all summer long and—even after it had been blown down in early-autumn gale—left its lessons to guide engineers in the use of drapes and acoustical board in building its ever-so-much-more dignified indoor successor which was opened the following October 3 at East Pittsburgh.

These were days of endless, and frequently amusing, "*growing pains*" at **KDKA**.

Early fans still recall the whistle of a passing freight train which, in the days of the tent studio, became a regular 8:30 p.m. feature, no matter what the program.

### **Insect in Tenor's Mouth Puts Station Off the Air**

Singing in the tent studio one evening, a well-known tenor opened his mouth wide to sing a full, high note and almost swallowed an insect. His comments, which came in a torrent of angry words as soon as he caught his breath, were not in good radio taste—and a vigilant operator took the station off the air in a hurry.

On another occasion, after the first indoor studio had been built, a stray dog raced into the studio while Announcer Arlin was presenting baseball scores, upset the microphone—



The late T. J. Vastine conducted radio's first band concert in 1921 over KDKA. Musicians were Westinghouse employees.



Everyone wanted to get into the act when radio listening became the "in" thing to do. Here, listeners enjoy the new excitement on an early crystal set.



#### GOING PLACES

Typical of early promotions to gain new listeners in this scene of a radio pick-up aboard a crack train in 1922.

scrambling scores, notes and announcer—then added his excited barks to the pandemonium.

The radio debut of Economist Roger Babson was another memorable occasion for Mr. Arlin. At great pains to reassure his guest, somewhat nervous at his first venture on the air, Mr. Arlin learned, after five minutes of Mr. Babson's speech, that the transmitter was not operating, and the entire program had to be repeated.

Testing some of **KDKA's** earliest short wave equipment for remote pickup, Engineer Little had the embarrassing experience of breaking into the Lord's Prayer during a broadcast from Pittsburgh's Point Breeze Presbyterian Church with a monotonous "*one, two, three . . . testing.*" Both regular wire and short wave link pickups had been installed and someone, inadvertently, opened Mr. Little's short wave "*mike*" while services were being broadcast via the wire pickup.

A broken wire at a tense moment in the memorable Dempsey-Firpo fight and an announcer's zeal to keep the station on the air combined to produce another pioneering chuckle.

The break came just as the excited ringside announcer was shouting "*Firpo lands a terrific blow knocking the champion . . .*"—and the standby announcer in the studio, snatching up the first convenient bit of copy, continued almost without interruption "*with hogs up two cents a pound . . .*"

By an unfortunate circumstance he had picked up a market report instead of late news flashes.

## Heavyweight Championship, World Series

Much of the early history of sports in radio was written by **KDKA** during the summer and autumn of 1921.

On July 2 **KDKA** broadcast the four-round World's Heavyweight Boxing Championship between Titleholder Jack Dempsey—who had defeated Jess Willard at Toledo just two years before—and French Challenger Georges Carpentier, blow-by-blow from Boyles' Thirty Acres at Jersey City.

In early August **KDKA** broadcast play-by-play detail of Davis Cup Tennis Matches in which the Australian team defeated British netmen at Pittsburgh's Allegheny Country Club in suburban Sewickley.

Baseball's first play-by-play radio coverage came August 5 when Announcer Arlin described the Pittsburgh Pirates' 8-5 victory over the Philadelphia Phils from Forbes Field.

The 1921 World Series was an all New York affair with the Giants meeting the Yankees at the Polo Grounds. The opener came Oct. 5 and **KDKA**, with a direct wire to Pittsburgh, broadcast play-by-play detail by Grantland Rice. The Giants lost the opener 3-0, but came on to take the series five games to three.

Luminaries in the Giant lineup included: Pitcher Art Nehf; "Fordham Frankie" Frisch; "Long George" Kelly; and Emil Meusel, whose brother, Bob, played right field for the Yankees.

Other Yankee celebrities included: Babe Ruth; Waite Hoyt; Bob Shawkey, and Carl Mays, who won the opener.

The first orchestra developed for exclusive radio work was KDKA's Little Symphony Orchestra. Victor Saudek conducted the group in 1922.



Scenes such as this in the studios of WJZ, Newark, in 1923 were quite common. Families gathered around their home sets to listen to top entertainers from all parts of the country. WJZ was Westinghouse's third station.



William Jennings Bryan was only one of many distinguished men to make radio addresses over KDKA. Here on March 12, 1922, he speaks from the pulpit of the Point Breeze Presbyterian Church in Pittsburgh.



To Pitt and West Virginia goes the honor of sharing radio's first play-by-play football. The occasion was Pitt's 21-13 victory over West Virginia Oct. 8, 1921, and it was another first for Announcer Arlin.

### **Non-partisan Radio Policy Established**

First political broadcast came in September 1921 when **KDKA**—recognizing the powerful influence of broadcasting in shaping popular opinion—made time available, without charge, on consecutive evenings so that aspirants for nomination as their respective party's candidate for Mayor of Pittsburgh might state their views for listeners.

William A. Magee, Republican, spoke Monday, Sept. 12; Joseph A. Mackrell, Republican, spoke Sept. 13; and William N. McNair, Democrat, spoke Sept. 14. In establishing this equal availability of air time for all candidates **KDKA** pioneered the non-partisan radio attitude now demanded of all stations by ironclad rule of the Federal Communications Commission. Under present rules, time may be either free or paid, but the policy must be identical for all candidates.

Radio's first news room was established Sept. 20, 1921, when **KDKA** installed regular remote pickup facilities at the old **Pittsburgh POST**.

First Catholic radio services were presented from **KDKA** November 28, 1921, by the late Rev. Thomas F. Coakley from Old St. Patrick's Church, 17th Street and Liberty Avenue, Pittsburgh. Father Coakley recalled how listeners, noting that the collection was omitted from the radio service, sent their contributions by mail.

Other history-making events in the early days of **KDKA** included:

The first radio address by William Jennings Bryan, "The Great Commoner," from the Point Breeze Presbyterian Church, March 12, 1922.

Organization of the **KDKA Little Symphony**—the first musical group in the world established exclusively for radio broadcasting—by Victor Saudek, December 4, 1922.

### **Lowell Thomas Radio Bow from KDKA**

First radio appearance of Lowell Thomas was March 30, 1925, when he discussed "*Man's First Flight Around the World.*"

Another top-flight radio personality who made his debut with Westinghouse, although not at **KDKA**, was Milton Cross. Employed in the Westinghouse Newark Plant when **WJZ** was established, he was encouraged to try announcing and shortly became one of radio's best-known figures.

With broadcasting well on its way, Dr. Conrad in late 1920, turned his attention once again to his amateur station at Wilkinsburg. Like all amateurs, his **8XK** operated in the short wave band, which was considered of little value and thus became the limbo to which amateurs were consigned.

However, Dr. Conrad did not share this contempt for short waves since, as he pointed out later, "*some experiences in picking up distant stations on a harmonic of the operating wave cast doubt on the generally accepted theories that the range of short waves was definitely limited.*"

With this conviction he began experiments in the spring of 1921, exchanging messages on wavelengths below 100 meters with two amateur friends, J. C. Ramsey and R. D. Decker, both of Boston, and with a station at the Massachusetts Institute of Technology.



Eddie Cantor poses before a makeshift microphone for his radio debut on KDKA in 1923 . . . a few years before he became a regular radio performer.



In 1923, Dr. Vladimir K. Zworykin, a Russian-born scientist then employed in the Westinghouse Research Laboratories, applied for a patent on an electronic-beam television pickup. Here, six years later, Dr. Zworykin shows the new cathode ray television system, invented, developed and demonstrated at Westinghouse.



The late Rosey Rowswell and "Aunt Minnie" are shown in an Austin car at Forbes Field in Pittsburgh promoting KDKA television demonstrations in the late 1930's. Mr. Rowswell was the Pittsburgh Pirates broadcaster for many years and is credited with building the tremendous interest of women in the team. "Aunt Minnie" was a character to whom he alluded on his baseball broadcasts.



## “Skip Distance” Behavior Studied

Out of these experiments came a better understanding of the confusing “*skip distance*” behavior of short waves—the phenomenon which had led many radio experts to the erroneous conclusion that this portion of the spectrum was useless. Tests revealed that short waves reflected by the Heaviside layer and other ionized strata of the earth’s rarefied outer atmosphere bounce back and forth between these layers and the earth—like a stone skipping on a pond—and can be received only in those places where they strike the earth’s surface.

With this improved understanding the short wave band soon became a favorite realm of radio research and, as a result, these once-despised frequencies—and others not then known—now have become the most useful in the entire electro-magnetic spectrum. Without them there would be: no radar; no static-free FM radio; no television; no low-power long-distance communications; and no practical high frequency heating of non-metallic substances for industry.

Active in this development since its earliest days, Westinghouse, August 1922, established its first short wave transmitter on the East Pittsburgh factory rooftop adjoining **KDKA**; and this station, licensed **8XS**, carried many of **KDKA**’s regular programs during tests.

Eager to conduct tests at greater distances and to explore possibilities of receiving and retransmitting the same program by short wave, Westinghouse engineers established a second short wave transmitter March 4, 1923, at the Cleveland (O.) Works. This was **KDPM**, radio’s first “*repeater*” station, and as such, a trailblazer in the basic principle of radio link transmission.

Another major Westinghouse contribution came the same year.

## All-electronic Television Born at Westinghouse

All previous television had employed mechanical scanning to break pictures into component lines—a requirement for radio transmission—and physical limitations of the mechanical process were retarding television development when in 1923, Dr. Vladimir K. Zworykin, a Russian-born scientist then employed in the Westinghouse Research Laboratories, applied for a patent on an electronic-beam television pickup. This system eliminated mechanical scanning, making pickup an all-electronic operation and led, after extensive development, to the iconoscope.

Six years later, in 1929, Dr. Zworykin demonstrated the kinescope which eliminated mechanical scanning from receiving as well, thus providing the first all-electronic television system—invented, developed, and demonstrated at Westinghouse. Today the iconoscope and kinescope—both adaptations of the cathode ray tube—are standard television equipment.

## “Repeater Station” Opened in Nebraska—Heard in England

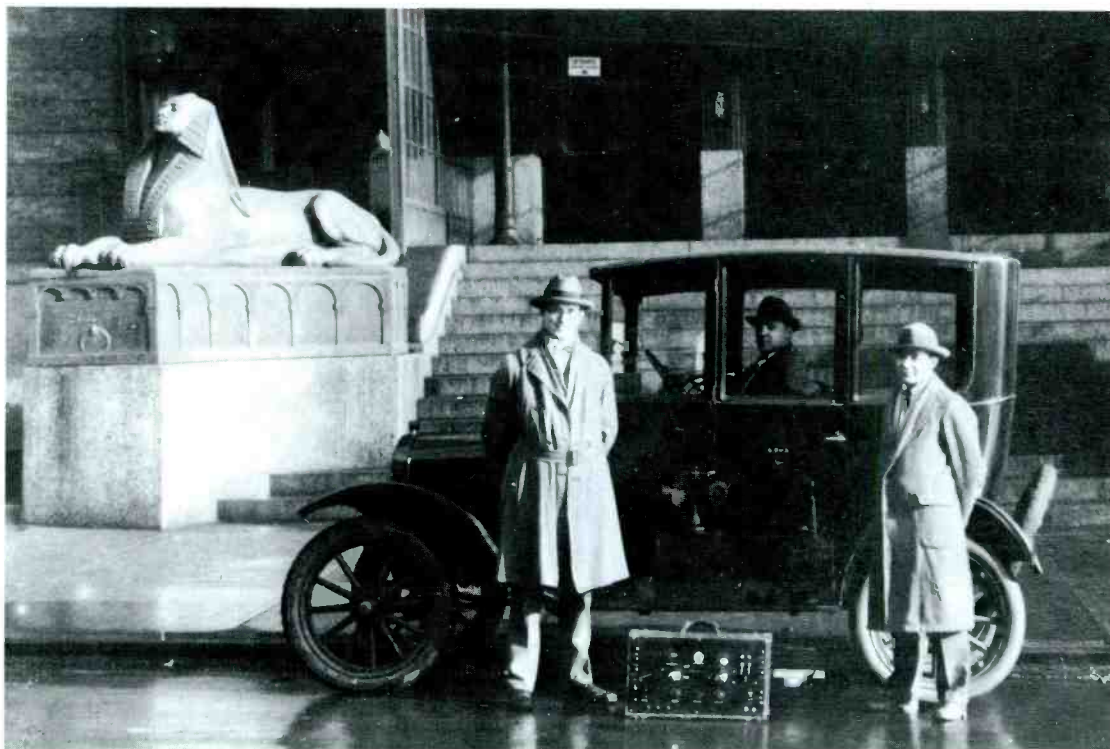
In July 1923, **8XS** began regular short wave broadcasts of **KDKA** programs several hours each evening, and the following month reception was reported in England. When this reception continued in good quality the British Broadcasting Corporation arranged to rebroadcast special greetings from **KDKA** to Great Britain the following New Year’s Eve.

The KDKA Radio Studios located in the William Penn Hotel in Pittsburgh at Christmas time in 1922. Looking somewhat like the inside of a burlap-lined casket, the studio contained burnt-orange, a popular decorator color in 1922, silk-draped meringes which billowed from the ceiling to disguise chandeliers.



#### THE HAPPINESS BOYS

Billy Jones and Ernie Hare — the original Happiness Boys — entertain with jokes and songs on a 1923 broadcast. (NBC Photo)



In 1926 KDKA had more than 40 pick-up points in Pittsburgh. The photo shows a car and crew that kept the pick-up points available for service. The car is in front of the Syria Mosque in Pittsburgh.

On November 22, 1923—the earlier **KDPM** “repeater” tests having proved the feasibility of radio relay operation—a third Westinghouse short wave transmitter was placed in service. It was **KFKX** at Hastings, Neb., especially designed as a “repeater station” to receive and rebroadcast short wave programs from **KDKA**. Purpose of the installation was to increase **KDKA** program coverage. The Hastings location was chosen because it is near the geographical center of the country, and as a result of the experiment millions of new listeners throughout North and South America—many of them living on remote farms and ranches—joined **KDKA**’s already sizable audience.

January 17, 1924, saw radio put to a new and dramatic use.

A Hudson Bay Company trapper, then marooned in the Far North, knew that his wife was undergoing a serious emergency operation; however, he had no way of knowing the outcome until his return to civilization after the spring thaws. Friends, recalling that the party had several radio receivers, asked **KDKA** to broadcast news of the wife’s recovery.

### **Far North Service Born**

Farm Editor Mullen included this personal message on his program several times and was rewarded the following April with a message of thanks from the grateful trapper who had heard the broadcast without difficulty.

During the following summer the Canadian government sought the cooperation of **KDKA** in maintaining radio contact with the exploring ship *ARCTIC* during its annual summer cruise conducting government investigations and taking supplies to outposts. These tests, too, were most successful, and the ship was in constant touch with headquarters for the first time in the history of the service.

It was these demonstrations of radio’s great value to persons in inaccessible locations which led, shortly thereafter, to inauguration of the famed **KDKA** Far North Service—for years the one personal connection with civilization for hundreds of missionaries, traders, Royal Canadian Northwest Mounted Policemen, and other isolated dwellers at the top of the world.

Although **8XS** short wave was being heard regularly throughout the United States and in Canada, South America, Great Britain, and most of Europe, many radio engineers remained skeptical of its worth. Thus, when representatives of several associated radio companies met in London in 1924 to consider a radio link between Europe and South America, attention was focused on ultra-long wave transmission—at an estimated cost of \$4,000,000.

### **Curtain Rod Antenna Saves Millions**

Included in the American delegation was Dr. Conrad, who had arranged with his friends at **8XS** to broadcast news from home, and who had taken along a small short wave receiver to hear these broadcasts.

After sitting through meeting after meeting in which only long wave transmission was discussed—but unwilling to project himself into the debate, since his role was primarily that of an observer—Dr. Conrad finally set up a demonstration of short wave to catch the attention of other delegates.

Arranging with his **8XS** colleagues to transmit a certain day’s news via short wave—but by telegraph code rather than by voice, as was their custom—Dr. Conrad invited

A soloist was expected to ignore the "Silence, Please" sign in this 1925 KDKA studio located at a Westinghouse building in East Pittsburgh. The studio was amply padded to help subdue any unwanted sounds during the early live broadcasts.



### MUSIC HALL IMMORTALS

Weber and Fields, music hall immortals, were early radio stars. They participated in the opening of the NBC network in 1926. (NBC Photo)



### CLIQUOT CLUB ESKIMOS

Popular during the early 1930's were Harry Reser (center, front) and the Cliquot Club Eskimos. (NBC Photo)



Aeriola Jr. was the first popular-priced home radio receiver. This tiny crystal set, designed by KDKA engineers in 1921, was 6" x 6" x 7" in size, employed earphones, had a range of 12-15 miles and sold for \$25. At last there was a set simple enough to be operated by non-technical fans and inexpensive enough to be afforded by every household.



several delegates, among them a former ship's wireless operator, to his hotel room; and with only the curtain rod for an antenna, asked the operator to copy news from Pittsburgh.

Thoroughly impressed by the demonstration, the operator-delegate recited his experience before the meeting the following day and as a result the Europe-to-South America radio link was by short wave—and at a saving of three and a half million dollars.

### **International Station “In Uniform”**

In mid-summer 1924, Dr. Conrad transferred his **8XK** license—direct forebearer of **KDKA**—to Westinghouse; and the Company relinquished the **8XS** license under which it had been conducting its short wave research.

In January 1930 another short wave station was added—**W1XAZ** at Springfield, Mass.

After a sequence of changing call letters and transmitter locations, **8XK** and **W1XAZ** eventually were merged, January 1, 1921, as **WBOS** at Boston. This powerful transmitter, which served both Europe and South America, carried 12 hours of specialized programs each day before World War II with 13 specially trained announcers broadcasting in English, French, Spanish, and Portuguese. During the War it was a key station in the far-flung Psychological Warfare Service of the Office of War Information.

### **The RA and the DA Become the RC**

World War I had done much to stir interest in radio and with removal of the wartime ban on amateurs late in 1919 Westinghouse turned to development of equipment to meet the growing demands of these “hams”—old and new. Work progressed through 1920 and late in the year two receiver units, combinations for either code or voice, were ready.

They were the RA tuner to pick up carrier waves at from 200 to 600 meters (500 to 1500 kilocycles) later, and still, the heart of the broadcast band; and the DA detector-amplifier to convert these signals for listening. Available shortly after **KDKA** presented its epic inaugural broadcast these equipments were much in demand and shortly thereafter they were combined as the Westinghouse RC regenerative receiver.

These units sold for \$65 each or \$125 in combination and a special adapter was available so that the horn of any convenient phonograph might be used as a loudspeaker. In addition, self-contained loudspeakers using the same adapter on the coiled brass horn section of the early rubber-bulb type automobile horn, were available for an extra \$15.

The RC receiver went into production in February 1921, and remained a prime favorite with early radio fans for more than two years.

### **First Popular-priced Home Receivers Built in 1921**

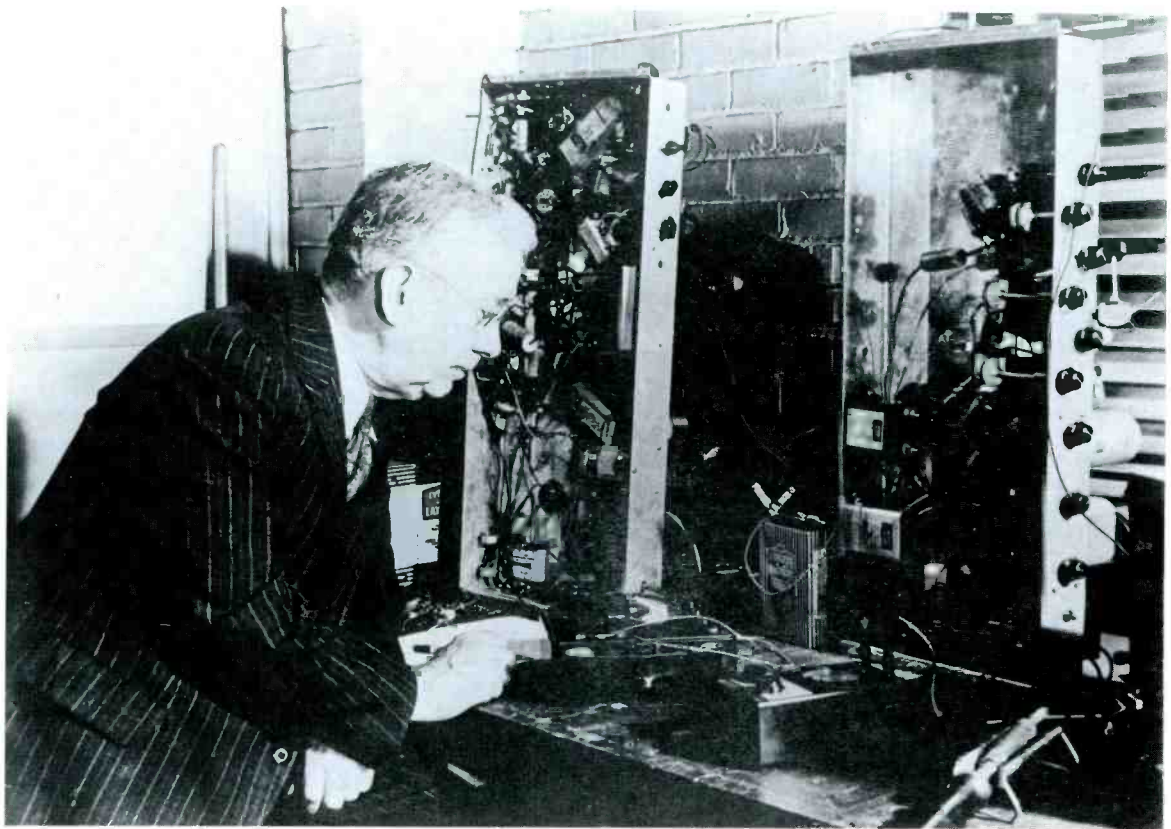
From its earliest days, however, Westinghouse officials regarded broadcasting as a public service and, as such, one which should be made available to the widest possible audience. This meant a serviceable popular-priced receiver and thus it was that while the **KDKA** staff was busy with its trailblazing, other Westinghouse engineers were designing a radio receiving set for homes—a set simple enough for the non-technical fan to operate, and inexpensive enough to be afforded in every household.

This new model was ready in June 1921.

It was the Aeriola, Jr.—first popular-priced home radio receiver—a tiny crystal set,



**KDKA Orchestra in 1938, conducted by Maurice Spitalny, brother of the famous all-girl orchestra leader, Phil Spitalny, during a program originating from KDKA's Grant Building Studios.**



**The late Dr. Frank Conrad conducted the experimental work that led to the establishment of KDKA Radio, Pittsburgh, and supervised the construction of the station.**

six-by-six-by-seven inches in size. It employed earphones, had a range of from 12 to 15 miles, and sold for \$25.

With this first model launched, engineers turned at once to refinements and by December, two new and improved models were ready—Aeriola, Sr., first home radio receiver to use a vacuum tube; and Aeriola Grand, first self-contained home radio receiver.

Aeriola, Sr., was of about the same size and appearance as its predecessor. It used dry batteries and one vacuum tube and sold for \$60.

Aeriola Grand represented a greater advance. This was a tablecabinet model 12 by 15 by 16 inches, with a built-in loudspeaker and several vacuum tubes. It was with this model, which sold for \$175, that radio receivers first began to take on the familiar appearance of today's sets.

Greatest single Westinghouse contribution to radio receivers, however, came two years later with the introduction of the thermionic vacuum tube with indirectly heated cathode. This is the tube which eliminated batteries and made possible radio reception using ordinary house current. It is a fundamental principle of all modern radio.

## **FM Patents Granted in 20's**

As early as 1920 Westinghouse was employing frequency modulation in telegraphic communications. This principle, today's familiar FM, was pioneered by Dr. Conrad and C. J. Burnside, a former manager of the Westinghouse Electronics Division now an electronics consultant, and Westinghouse was granted more than 20 FM patents between 1920 and 1928.

Although introduction of broadcasting was a rather simple matter, the preliminaries were far from simple.

Two things, more than any others, are responsible for broadcasting—first, better understanding of the vacuum tube and its uses; and second, realization that radio is a universal service.

Dr. Conrad and his co-worker, Engineer Little, discovered latent possibilities of the vacuum tube while working on World War I Radio contracts undertaken by Westinghouse for the United States and British governments; but it was not until the **Joseph Horne Co.** advertised "amateur wireless sets" to hear Dr. Conrad's early "ham" programs, that radio's universality was recognized.

At the site of Dr. Conrad's former home in Wilkesburg, a plaque was dedicated on November 2, 1957, the 37th anniversary of that first broadcast.

It reads:

### **BIRTHPLACE OF RADIO BROADCASTING**

**Here radio broadcasting was born. At this location, Dr. Frank Conrad, Westinghouse Engineer and Scientist, conducted experimental broadcasts which led to the establishment of KDKA and modern radio broadcasting, and to the world's first scheduled Broadcast, November 2, 1920.**

**Dr. Frank Conrad  
1874-1941**

One of KDKA's staff announcers from 1938-1940 was Dave Garroway. Here he is shown doing an on-the-spot broadcast.



As one of its activities during World War II, KDKA Bondwagon shows were presented in many communities in the station's coverage area. Direct sale of war bonds reached well over a million dollars. KDKA also participated in other rallies and promotions that resulted in total sales of more than 6.6 million dollars worth of bonds.



Actor Charles Laughton took time out in the early 1940's to examine the original KDKA microphone and some of its successors . . . quite different from the highly specialized equipment used today.



## **The Station**

KDKA Radio is a Group W, Westinghouse Broadcasting Company, Inc. station. It is a 50,000 watt clear channel station located at 1020 on the dial and operates 24 hours a day.

Other Group W stations are: WBZ and WBZ-TV, Boston; WJZ-TV, Baltimore; KDKA-TV, Pittsburgh; KYW and KYW-TV, Philadelphia; WOWO, Fort Wayne, Ind.; WIND, Chicago; KPIX, San Francisco; WINS, New York; and KFWB, Los Angeles.

Donald H. McGannon is Chairman of the Board and President of Westinghouse Broadcasting Co., Inc. Marvin L. Shapiro is President of Westinghouse Broadcasting Station Group. Edward Wallis is Group W Area Vice President for Pittsburgh. A. B. Hartman is General Manager of KDKA Radio.

KDKA-FM (92.9 megacycles) operates seven days a week from 6 AM until Midnight. KDKA-AM and FM are simulcast from 6 AM until noon.

