

Radio Between Two Wars



J. G. Harbord
Chairman of Board, RCA

Lt. Gen. James G. Harbord (retired) was born in 1866. Graduated Kansas State Ag. Col., 1886. Enlisted in 4th Inf. 1899. Appointed Major, 2nd U.S. Vol. Cavalry, Torry Rough Riders, in war with Spain. Graduated War College, 1917, promoted Lt. Col. Chief of Staff to Gen. Pershing until 1918, meanwhile made Brig. Gen. Assigned to command Services of Supply, 1918; reappointed Chief of Staff, A.E.F., 1919, until sent to Near East as Chief of Amer. Mil. Mission to Armenia. Commanded 2nd Div. until 1921. Retired from Army and joined RCA, 1922.

**Outstanding events in radio since
1918, and its apparent possibilities
in the forthcoming postwar period.**

IN ONE of the hit songs of the current musical comedy "Oklahoma" a young cowhand describes to his amazed friends back home the marvels he beheld on a trip to Kansas City—which then was just emerging from the gaslight era. Each verse, relating new wonders of the early 1900's, ends with the awed assertion: "They've gone about as far as they can go." That was the way I felt about it myself when I first saw Kansas City in 1839.

The delighted chuckles with which the song is greeted by audiences is traceable in part to the fact that everyone who hears it can recall occasions when he has had the same attitude as the young Oklahoman. The more dramatic the advance by which we are confronted, the more likely we are to conclude that it represents the ultimate of progress in its field. Long before the beginning date which RADIO NEWS is observing in its twenty-fifth anniversary issue, there had been some intelligent men who already had decided that radio had just about achieved its ends. They contemplated its startling accomplishments at sea, where it had ended the communication silence of centuries and where it had no competitor, and said: "It will never do much on land."

Experimental large-screen television receiver. The translucent screen is retractable and slides down into the cabinet when not in use.



The quarter-century which RADIO NEWS now celebrates has proved that radio discourages its prophets far more often by outstripping their bold prediction than by failure to reach it. I know of no better way to catch some glimpse of the bright future prospects of this still young, still swiftly advancing science and industry than to glance briefly at some of the milestones of radio between our two World Wars.

Radio entered the first World War as an awkward rookie. The belligerent powers, appreciating its potential value, spent large sums for its development. Our laboratory and field test section in the A.E.F. in France, aided by research in America, made many improvements in the French sets upon which we had to rely when we entered the conflict. A program to create radio apparatus to fill the special requirements of our Army was nearing completion when the Armistice was declared. Broadcast information as known then could hardly be recognized as even remotely related to the present service. Time was broadcast from the Eiffel Tower station by the Allies, and various field transmitters sent out meteorological data. In the final months, Station POZ at Nauen made a feeble stab at propaganda by daily bulletins in French, English and German, glorifying German successes and pooh-poohing Allied gains. The entire number of radio operators who heard those bulletins did not greatly exceed the number of excuses Herr Goebbels has offered for Nazi retreats in North Africa, Sicily and Russia.

The first radio research laboratory of RCA, located in a tent at Riverhead, Long Island, New York, in 1919.



Looking back, we can see that the radio in which we took considerable pride was still somewhat of a rookie when peace came in 1918. It was useful for exchange or delivery of messages, on a scale which seems trivial when compared to its applications today. Its astounding advances and successes came in its adjustment to civilian life, an adjustment which some of us war veterans found rather difficult.

It would be superfluous, even if space permitted, to trace in detail for readers of RADIO NEWS all the familiar outstanding events which marked radio's rise to its present stature. My purpose in mentioning a few of the many striking achievements is to indicate how each separate achievement has led, and continues to lead, to forward strides in the various related fields of radio.

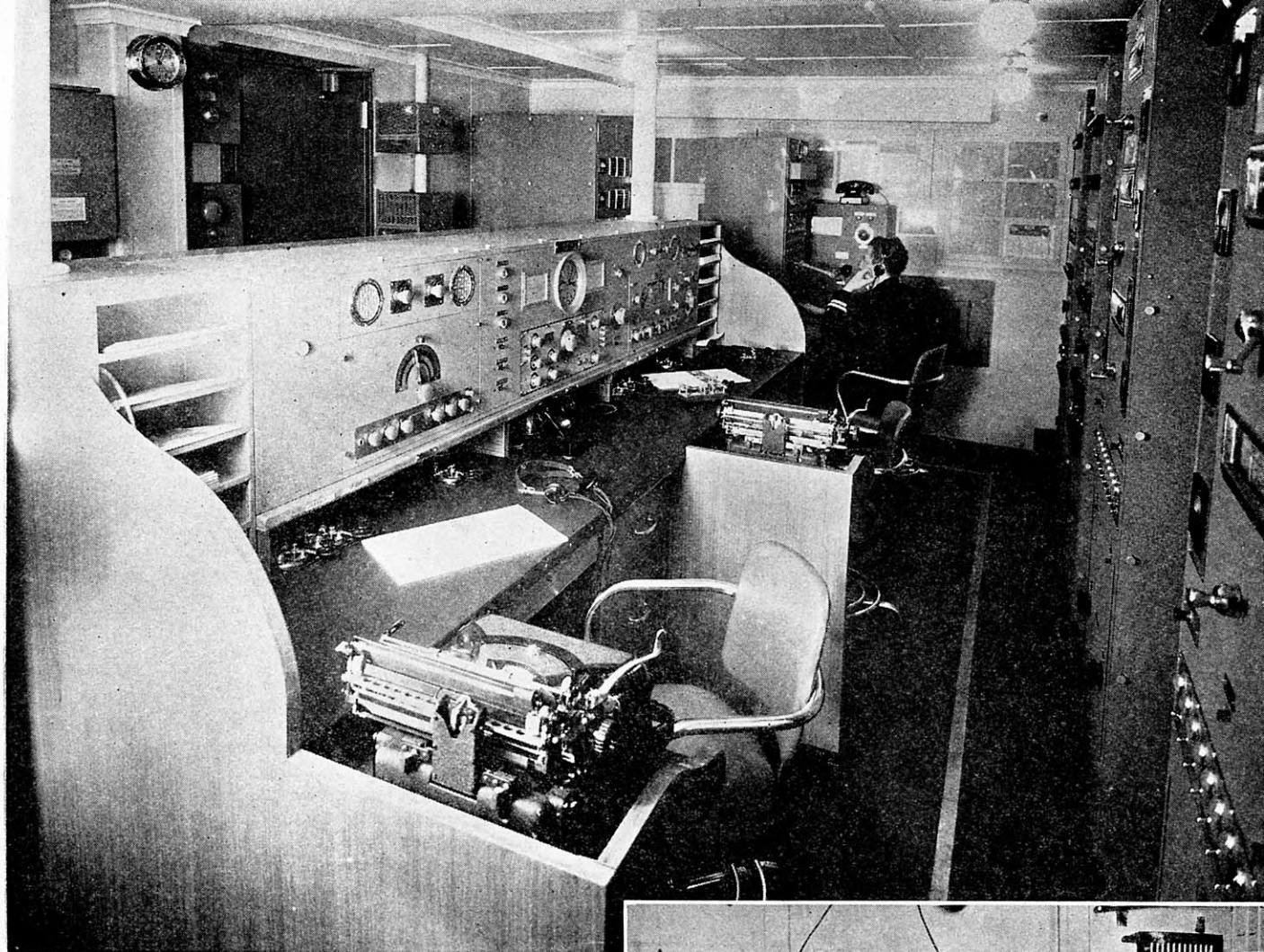
The first great stride of radio after World War I came as a result of the realization in the United States of that war's lesson in what could be accomplished by directed research and by the adjustment of patent claims and counterclaims of rival organizations. The encouragement which the Government gave to the organization of radio in the United States on a practical business basis was followed quickly by the first message flashed across the Atlantic by the Radio Corporation of America, on March 1, 1920, immediately after the return of the high-powered stations that had been under Government control in the war. That was the dawn of an era in which American radio communications companies have linked our nations to all the important countries of the globe.

Broadcasting, talkative, singing, jovial younger brother of radiotelegraphy, had just begun to say a few words and sing a few songs at the time. Some months off was the early public appearance which stands out most prominently in the nation's memory, the announcement of the Harding election returns in November of 1920 from Station KDKA in Pittsburgh. When Americans read their newspapers the next morning they saw that "normalcy" would soon include a development of which most of them had not even dreamed—music and information and entertainment by living voices sent directly into their homes.

Marine and transoceanic radiotelegraphy, which had only recently been regarded as the ultimate objectives and

Present-day RCA laboratory at Princeton, N. J. The advancement of the radio industry is clearly shown by these two photos.





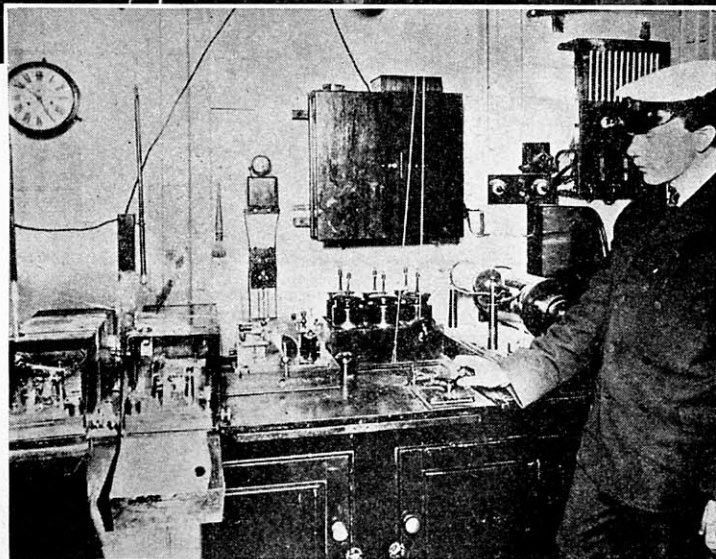
Modern marine installation. Included are five radio transmitters, vacuum-tube type; five receivers; and auto alarm.

limitations of radio, were overshadowed by the general public acclaim of the new marvel of broadcasting. But they were not overshadowed in the minds of radio engineers. These men of the research laboratories saw the spectacular advent of broadcasting as an opening to great, new possibilities in all the branches of radio.

What had been learned and what continued to be learned about radio transmission and reception in marine and shore-to-shore radio was applied to broadcasting. Broadcasting returned the favor by contributing discoveries which were of tremendous value in radiotelegraphy. The experiences of those who were occupied in transmission and reception were of great assistance to the engineers and manufacturers who designed and made radio tubes and receiving sets.

The first commercial marine vacuum-tube transmitting apparatus was installed in the coastal station at Chatham, Mass., late in 1921, introducing a new system of long-distance communication with ships by efficient use of continuous waves. On October 15 of 1922, for the first time in history, vacuum-tube transmitters successfully carried radio messages between New York, England and Germany. In that same year the establishment of a nationwide distribution and merchandising system for broadcast receiving sets and tubes showed that broadcasting had progressed from the status of a novelty to recognition as a permanent feature of the American scene. The vast contribution which radio was destined to make to other industries and services was indicated also in 1922 by successful two-way telephone conversations between the *S.S. America* at sea and ordinary telephones in homes and offices.

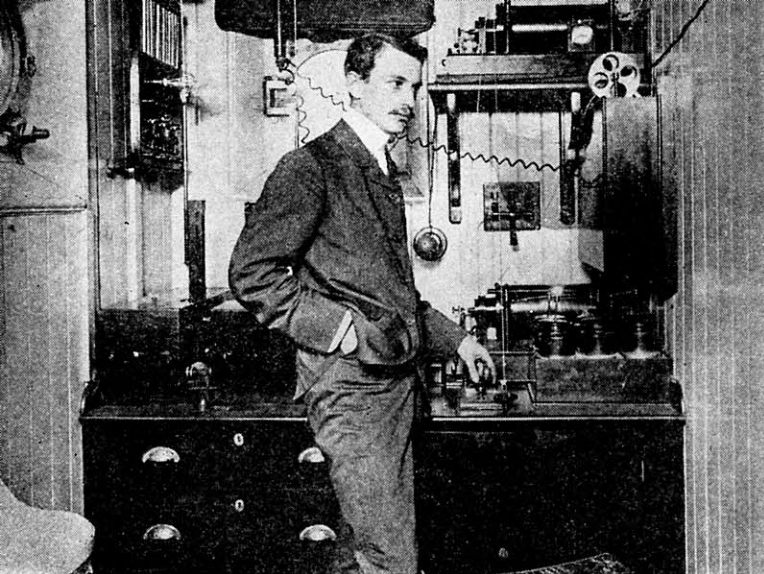
The next year found engineers investigating the prop-



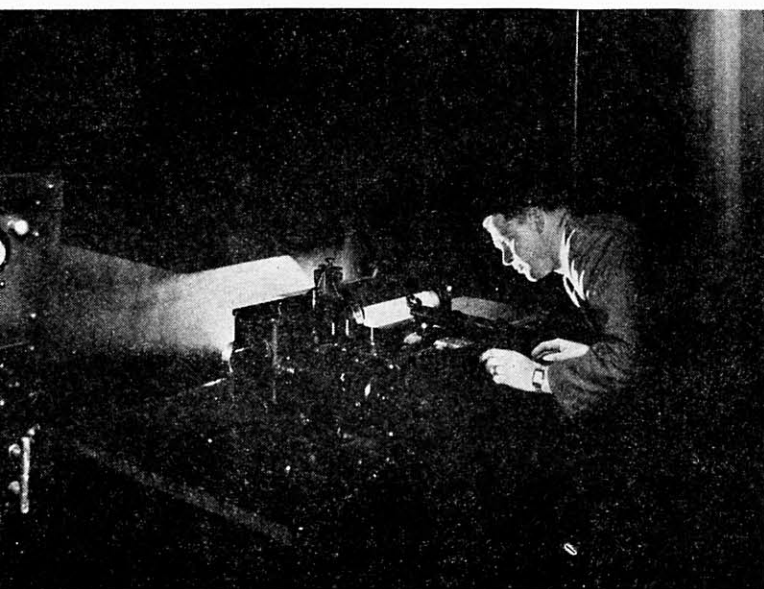
Spark type marine installation, by the British Marconi Co. in 1903. Shown at the left are the screened receiver and coherer.

erties of short waves. This was a quest which revealed radio treasures immediately, a quest which has gone on to this day and will continue to go on into the future, delving deeper into the spectrum and adding wider potentialities. The first use of broadcasting in a national political campaign in the Republican and Democratic conventions of 1924 came in the year when the superheterodyne receiving set first was marketed. International broadcasting made its formal debut in the next year when speech and music broadcast in England were retransmitted to American audiences.

The application of short waves to marine communication made possible the attainment of the ultimate distance in world communication in 1926 when contact was maintained



Early ship installation, British Marconi 1902 spark transmitter. (Left) shielded receiver and coherer; (right) open-type spark-gap.



Present-day RCA Transoceanic radio facsimile recorder in operation at Broad Street Central operating office, New York City, N. Y.

with the *S.S. Carintia* around the globe. On May 1 of that year, commercial facsimile service was inaugurated between New York and London by RCA for the transmission of photographs, and on September 9 the National Broadcasting Company was organized to provide network programs.

A.c. radio tubes, eliminating all batteries, were an outstanding achievement of 1927, the year in which radio collected weather reports for the transatlantic flights of Lindbergh and Byrd and communicated with Byrd's radio-equipped plane throughout most of its historic leap to the coast of France. A sound-on-film method for synchronized talking motion pictures came at about the same time, based on radio principles. Within twelve months diversity reception and directional transmission had been applied commercially to give short-wave international communication far greater reliability. They were designed for radiotelegraphy, but without them we could never have had the excellence of international broadcasting which has changed all previous ideas of the dissemination of historic world news in the second World War.

We could continue reviewing radio's advances, point by point down to the present day and find continuously recurring evidences of the interrelation and the exchange of knowledge between each of radio's separate fields. The whims of chance do not determine its future, because its

development did not come by chance. It is a product of directed research, tested in its growth by the application of theory to the exacting standards of daily use. Vacuum tubes, for example, did not reach their present perfection in a vacuum of pure guesswork. They were planned by scientists, tried in everyday commercial practice, replanned and retried to meet every new requirement. If one may borrow from a well known authority, "We planned it that way."

Substantial symbols of radio's scientific parenthood are seen in the industry's laboratories, including the RCA Laboratories at Princeton, N. J., opened proudly in the spring of 1942 as a center of research and pioneering and dedicated to increasing the usefulness of radio and electronics to the nation, to the public, and to the industry.

War has intensified both research and production. In its third year of the present war, radio is providing services which were not dreamed of by those who knew it as an undeveloped rookie in the A.E.F. of the first World War. Radio production in the United States, all for the armed services, now amounts to \$250,000,000 a month, according to recent reports, as compared to \$30,000,000 a month last year. This is the industry which boasted of the almost unbelievable production of receiving sets with a total value of \$2,000,000 in the year 1920!

Radio at war rides with and guides our ships on all the seas. It flies with our planes, shares life-saving rafts with our sailors, goes into foxholes as a walkie-talkie, onto beachheads as a handy-talkie, calls the shots as radar. It reports the war's events to all America every hour of the day and night, takes music, news and entertainment from home to our fighting men at distant points, slices through all barriers to talk to the people of enemy and occupied countries. It helps to time the attack, to find the enemy and assist the artillery in aiming its fire. It coordinates ground, sea and air operations and sustains the precision with which bomber squadrons range and strike deep into hostile territory.

When the complete story of radio in the second World War can be told there will be disclosures which will surprise even those who are close to the industry. The war's developments will stand ready for adoption to peacetime use, along with other developments held up by the war for commercial introduction. All indications are that after victory—on which the industry is now concentrating all its efforts—there will be a surge of radio progress.

Television looms among the prospects for a postwar era in which reconversion of factories will be a problem and the creation of jobs an essential objective of industry and the nation. This service which the public is awaiting eagerly cannot be developed in a day, a week or within a few months. But when it does come, it will open tremendous opportunities for radio. Paul Hoffman, president of the Studebaker Company and Chairman of the Committee for Economic Development, has estimated that in television there is a potential source of 4,600,000 new jobs within a decade of its full commercialization.

Frequency modulation on ultra-short waves, extension of the use of radio heating in industry, increased applications of the electron microscope and the electron micro-analyzer, and tiny tubes which will make possible much more compact apparatus are also among the near or more distant promises of the years after victory.

The greatest promise of radio rests upon the fact that it is a science as well as an industry producing vital services. Science knows virtually no boundaries. So long as keenly inquiring researchers seek new discoveries, so long as invention, independent enterprise, and individual initiative are encouraged, it can never be said truthfully of the workers in radio: "They've gone about as far as they can go."