Radio News

May, 1936

"One, Two, Three, Four, Five"

"HELLO SHREEVE"

(First Words Spoken Across Atlantic)

Out of the countless industrial tasks radio has been called upon to fulfill none is as dramatic a story as the transoceanic radio telephone. The public gasps with astonishment when great discoveries are made. Yet when these are applied to work-a-day needs they become accepted in a matter-of-fact way without comment. This is the highest tribute that can be paid to scientific advancement; quick public utility of a new development is a gauge of the homage due it

By **Stanley Kent**

TODAY, you can lift the receiver off your home or office telephone and engage in two-way conversation with any telephone subscriber in sixty foreign lands. The human voice, projected into the ether, knows no limitations of distance. But there was plenty of labor—years of it—behind the successful introduction of the radio-telephone.

It was in the early days of the World War—June, 1915—when the Bell Telephone System sent two young engineers, H. E. Shreeve and A. M. Curtis, to Paris with loads of experimental paraphernalia. Their mission was to carry on tests in the transoceanic reception of radio-telephone transmissions from the U. S. A.

Wartime Tests

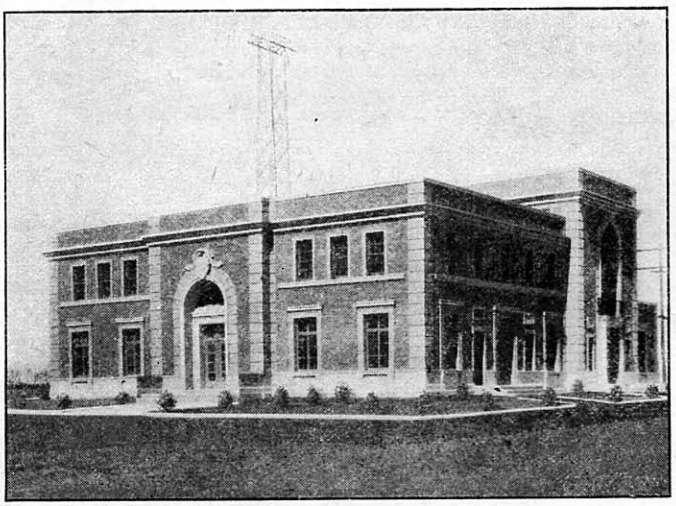
America was still a neutral nation and the French military authorities had very generously permitted Messrs. Shreeve and Curtis to set up their receiving equipment in the Eiffel Tower, which was the nerve center of French military communications.

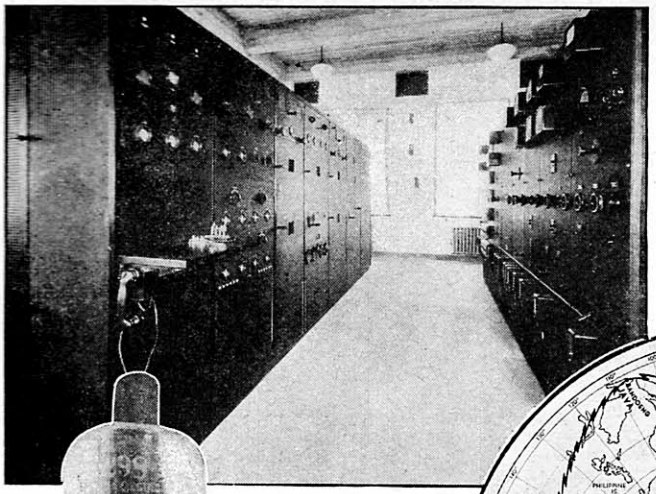
In New York, Bell laboratory workers developed one of the very first vacuum-tube, radio-telephone systems and, through the coöperation of the U. S. Navy, the use of the Arlington radio antenna had been obtained for the experimental transatlantic transmissions. The transmitter installed for the tests had hundreds of newly-developed power tubes.

Night after night, the American scientists in their Eiffel Tower station searched the air for the Paris voice signals without success. But in all this intervening period valuable data on static and interference were entered in their notebooks. War conditions necessitated the granting of minimum test time to these American experimenters in Paris. Some dubious reception was reported, but the first definitely successful test words, "One, two, three, four, five—" and "Hello!'" uttered in Arlington, were heard in Paris on October 9, 1915. Two days later, other fragments of speech were intelligibly received. But it was not until October 23 that the following entry went into the engineers' notebook: "At 5:37 heard the phrase, 'Hello, Shreeve! How is the weather this morning?'" It is from this latter date that the successful bridging of the Atlantic by

WHERE TELEPHONE VOICES JUMP INTO ETHER

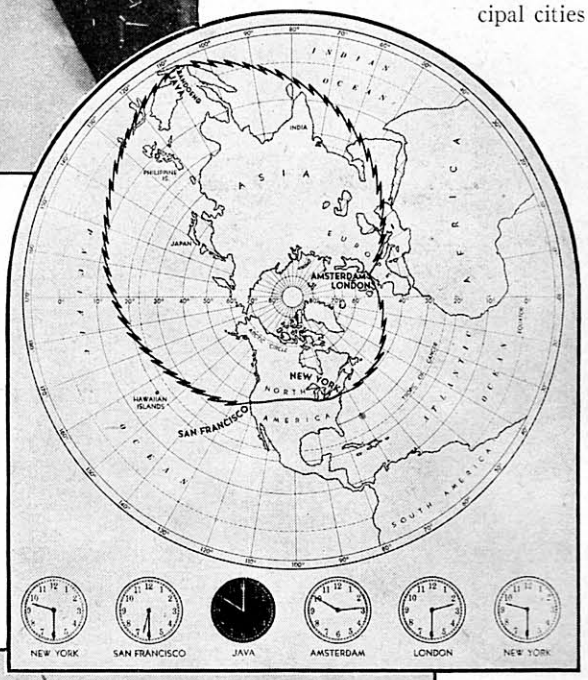
The radio-telephone transmitting station at Lawrenceville, New Jersey, the American terminal of the transatlantic radio telephone link, where human voices are put on radio waves for transmission to the European terminals, where they are again "captured" and made to travel along telephone wires





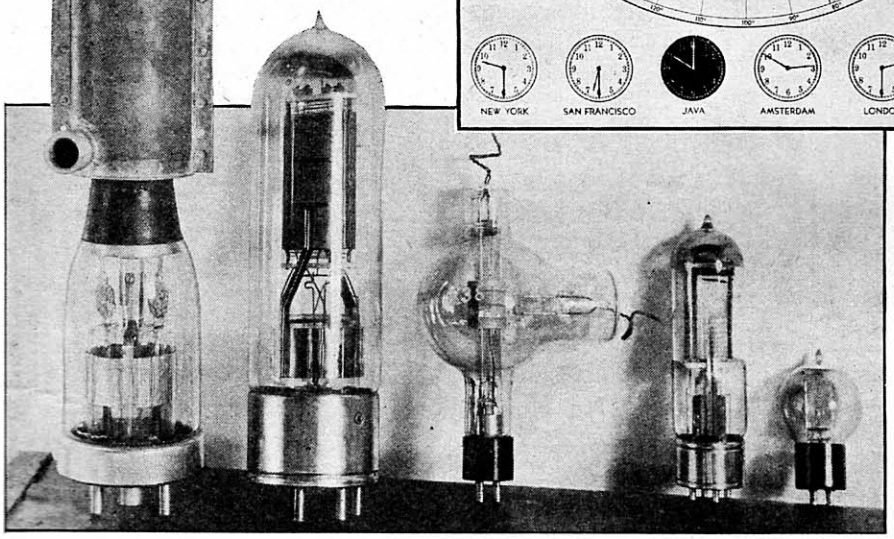
TRANSPACIFIC

Radio-telephone transmitter at Dixon, California. At left: The transmitting panels. Right: The power control board



CIRCLES GLOBE

Right: Path of first two-way telephone message around the world. Clock diagrams show different times, day and night, signals passed through on their world flight



TUBES USED FOR TELEPHONY

This group of vacuum tubes are the various types employed for transmitting telephone messages, by radio, from the American stations to different parts of the world. Left to right, the tubes are: type 240A, 10,000 watts; type 212D, 250 watts; type 260A, 75 watts; type 248A, 50 watts and type 205D, 5 watts

radioed voice is measured by the world.

And now, with a score and one years past since that eventful test, about 93 percent of the world's telephones are available on your home instrument. Consistently, through the years, borrowing on all the great improvements to the radio art, the service became more and more reliable until the process of calling London, Africa or Java is not thought more of a wonder than calling a neighbor a few doors away.

Service Established

Commercial transatlantic telephone service does not, of course, date back to the initial 1915 tests. The achievements of later years' experimenting contributed to the launching on January 7, 1927, of the first commercial telephone service between the United States and Europe. It was on that day that the London service was opened. This joined, by human voice, the Old World and the New with two-way phone service. And, today, with still added improvements available, overseas radio-telephony links every continent.

All other extensions of the system were applied gradually. The service from the U. S. A. to London was soon available to all of the British Isles. In 1928, service was opened, via the London station, to many parts of Belgium, Holland, France, Germany, Sweden, Norway, Denmark, Switzerland, Spain, Hungary, Czechoslovakia and Austria. Also, this same year, extension to Africa was achieved when the overseas radio service reached Ceuta in Spanish Morocco, Africa.

In 1930, a great stride was made when the South American link was added and the service was made available to principal cities in Argentina, Chile and Uruguay. The following year saw the addition of Java, Sumatra, Bermuda, the Canary Islands and Hawaii to the world roster of the service. In 1933, the Philippines, the Canal Zone and Central American nations were added to the list. The next year saw the addition of Japan to the circuit.

Now World-Wide

Thus, in less than a decade since the start of commercial transoceanic service, the world had been encircled by the radio-telephone. A recent event that demonstrated the conquering of early obstacles was the impressive round-the-world conversation between Walter S. Gifford, president of the American Telephone and Telegraph Company, and T. G. Miller, head of the firm's long lines department. The pair took part in a novel test to demonstrate the importance of the vacuum tube in making practical globe-encircling radio-telephone connections.

Gifford and Miller sat fifty feet apart for the unique test. Gifford's voice traveled west and reached Miller's ear from the east while Miller's utterances journeyed eastward and arrived from the west. In each of the globe-encircling circuits, 490 vacuum tubes were employed—*a total of 980 for the two-way talk!*

1000 Vacuum Tubes

Using almost 1000 tubes for a conversation seems startling. But what a huge task they performed with definitely assured results! A quantity of the total number of tubes was in telephone repeaters between New York and San Francisco. Others were in the special radio-telephone transmitting and receiving stations employed in the hook-ups. Approximately 85 percent of the distance around the world was covered by radio-telephone, the remaining 15 percent by land lines.

The tubes ranged from some no bigger than the average home receiver uses to the giant, water-cooled metal transmitting valves. Electric waves, traveling by wire or radio, diminish in strength or power with distance. Hence, vacuum tubes (*Turn to page* 693)

heard on 15.3 meters Sunday nights 6:45 to 9 p.m. E.S.T.? Is it LRU, Buenos Aires? (Sauberlich, Moore.)

CEC, Santiago, Chile, 10670 kc., 5 to 6:45 p.m. E.S.T. (Dressler.)

OCI, Lima, Peru, 47.97 meters, reported heard. (Byrns.)

OAX4D, Lima, Peru, 5780 kc. reported as best South American station after 11 p.m. E.S.T. (McKay, Cox.)

CB615, Santiago, Chile, 6150 kc., reported heard 7 to 10 p.m. E.S.T. (Chambers.)

CE960, Santiago, Chile, 9600 kc. reported heard 6 to 10 p.m. E.S.T. (Chambers, Pilgrim, Gallagher, Moore, Skatzes, Hammersley, Edbrooke.)

HCK, Quito, Ecuador, has changed frequency to about 5890 kc. heard 9-10 p.m. E.S.T. (Smith.)

HC1PQ, Quito, Ecuador, 6680 kc. reported heard until 11:30 p.m. E.S.T. (Stokes, Andrews.)

OCEANIA

KKP, Honolulu, Hawaii, 16030 kc. heard irregularly 11:30 p.m. E.S.T. (Hull, Wolf.)

KKO, Kahuku, Hawaii, heard at about 15300 kc. relaying programs to N.B.C. at 7:45 p.m. E.S.T. onward. (Christoph.)

KKH, Kahuku, Hawaii, 7520 kc. relays KGMB Mondays 12:30 a.m. E.S.T. (Lawton.)

KIO, Hawaii, 25.12 meters heard testing with music 5:15 p.m. (Loke.)

K6BAZ, Howland Island, 20.9 meters; an amateur heard at 5:30 p.m. (Loke.) New station in Tahiti testing on 7.1 megacycles Tuesdays and Fridays 11-12 midnight; call sound like FZ or F3 to start with. (Harris.)

VPD, Suva, Fiji Islands, 13075 reported heard 12:30-1:30 a.m. E.S.T. (Pickering, Costes, Craft, Bower.)

Readers Who Are Awarded "Honorable Mention" for Their Work in Connection with This Month's Short-Wave Report

W. G. Graham, Ed. McKay, R. W. Sahlbach, Virgil Scott, Roderick C. Owen, Russell L. Eley, Shirley Brown, George W. Osbahr, A. H. Dalal, H. J. Dent, Baron von Huene, Arthur Church, George Illenberger, Daniel Henry Carey, Rafael Penalver y Ballina, Kenneth Dressler, G. L. Harris, E. R. Wickham, Kenneth Duncan, Leonard Deutsch, Leo Herz, Thaddeus L. Grabek, Charles Spielman, Frank Clarke, Donald T. Silbert, Gus Sochor, Warren Hartman, John G. McConomy, Jose Rodriguez Rivas, Raymond Anderson, Clayton D. Sands, Arni Sigurdsson, Harry E. Kentzel, Fletcher W. Hartman, H. Thursten Clarke, Ralph Clarke, Rodney M. Craig, H. Kemp, John Hartshorn, F. T. Reilly, Gabriel M. Costes, J. F. Snyder, Jr., Eugene S. Allen, H. Westman, D. A. Seneviratne, Harry Wolf, Gerald Liccione, C. H. Skatzes, Clarence Morman, Fred Cost, Edward DeLaet, Howard E. Sauberlich, George C. Sholin, G. W. Twomey, Leonard Trinkle, Fred M. Craft, James P. Dod, Caleb A. Wilkinson, L. C. Hanna, J. F. Edbrooke, L. M. Jensen, Orval Dickes, Ian Foote, Hugo Lindquist, E. M. Siren, Oliver Amlie, C. A. Fraul, George L. Loke, L. D. Brewer, A. F. Dittmann, Louis Kuslan, Don Adams, R. O. Lamb, Richard H. Graham, James M. Coleman, Thos. Fallon, O. Ingmar Oleson, Robert Herman, Joe Stokes, Ian Cleveland Morgan, Charles Holt, C. McCormick, Gideon Brainerd, Don E. Sollenberger, James E. Moore, Jr., Frank J. Flora, V. L. Jacobs, A. B. Coover, Robert B. Hammersley, R. S. Houghton, A. V. Deterly, Harold H. Flick, Wm. Koehnlein, Trzuskowski, L. T. Lee, Jr., Edgar J. Vassallo, Augusto Anca, George James Ellsworth, Lewis Miller, Werner Howald, Jack Bews, Forrest W. Dodge, L. Cummins, Bruce Holmgren, Carleton L. Whittaker, Juan Manuel Salazar, Salvatore G. DeMarco, George H. Fletcher, Leon Stabler, George C. Akins, J. T. Atkinson, Louis Horwath, Jr., Paul E. Byrns, Bill Schumacher, Jerry M. Hynek, Robert Rogers, Frank Wheeler, Reeve Owen, R. Homsher, Roy T. Denkler, Robert A. Curtis, Floyd M. Murphy, Frank Emerson, Roy Sikus, Robert H. Weaver, Ed Brandon, M. Michaelson, Raymond S. Swenson, Paul V. Trice, Dwight Williamson, E. W. Turner, H. F. Gould, Fred A. Pilgrim, Arthur Leutenberg, Charlie E. Hansen, Roy L. Christoph L. Judson Greer, A. Kosynsky, Gordon L. Rich, J. R. Saladin, Fred. C. Lowe, Jr., Boris Scheierman, J. Edwin Wilson, R. C. Messer, Harold W. Bower, Duncan T. Donaldson, J. Wendell Partner, G. C. Gallagher, Walter F. Johnson, Morgan Foshay, Albert Pickering, A. T. Hull, Jr., R. L. Young, C. R. Devaraj, Manuel E. Betances, Walter L. Chambers, A. Belanger, A. B. Baadsgaard, Malcomb L. Gavin, Isaac T. Davis, Arthur Hamilton, Manuel Ortiz G., Thomas F. Tynan, Jack Lunn, R. Allen, Spencer E. Lawton, H. H. Parker, Laurent Gagnon, D. W. Parsons, Frank Sakely, Frank Nosworthy, Al Monoghan, Stanley E. Armsby, W. H. Capell, William J. Flanders.

Micro Waves

(*Continued from page 657*)

for the desired compactness. Micro-waves, he declared, also offered a phenomenal degree of penetration through intervening structures, so the tiny waves were employed in developing the new portable transmitter.

Experimenters with micro-waves may occasionally have the opportunity of picking up the NBC miniature transmitter when the program events originate within a short distance from their homes. Some of the earliest pioneer work on midget transmitters and receivers for utilizing these micro-waves was sponsored by RADIO NEWS during the latter part of the year 1934 and the beginning of 1935. A full description of these experiments and a detailed explanation of the apparatus can be found in the articles on ¾ meter transmission and reception (with the acorn tube) in the May, June, July, and August 1935 issues of this magazine.

"Hello, Shreeve"

(*Continued from page 648*)

in telephone repeaters, radio transmitters and radio receivers, build up and re-amplify the waning waves. Bell statisticians bring forth the fact that, on the two-way Gifford-Miller test, the various amplifications of power along the route—to compensate for power decreases and deflations—amounted to the total of 1,000,000 times 1,000,000 times 1,000,000, and so on for 33 multiplications in power.

The wide scope of radio-telephone facilities available to the public today can be discerned in studying the route of the circuits used in the Gifford-Miller talk. The route of the call was through San Francisco, Java, Amsterdam, London, and back to New York. Mr. Gifford's voice, from New York, crossed the continent over land lines through St. Louis and Los Angeles to San Francisco and then to the Bell short wave transmitter at Dixon, California. Leaping 9,000 miles across the Pacific to the overseas station of the Netherlands Telephone Administration at Bandoeng, Java, it was transferred to another short wave circuit spanning the distance of 7,000 miles to Amsterdam. Then it was carried by submarine cable to the London trunk exchange and, in turn, to the British Post Office station at Rugby. The relay from Rugby was received by the American Telephone and Telegraph Company station at Netcong, New Jersey, and telephone cable completed the circuit to New York.

Miller's utterances, traveling in the opposite direction, were put on the air at the telephone company's transmitter at Lawrenceville, New Jersey. Received at Baldcock, England, the impulses, by wire, were conveyed to Amsterdam, for short wave relay to Java for retransmission to California. Wire lines completed the cross-country circuit to New York.

Thus the radio voice has dramatically conquered space. Present-day, world-wide service is a far cry from a Bell engineer's report in 1926 that "the chief obstacle to regular radio telephone service between New York and London is the lack of a reliable and stable connecting circuit." Constant research and technical advancements have triumphed. America's part in the development of the splendid 1936 service deserves abundant praise.

The DX Corner (Broadcast Band)

(*Continued from page 671*)

English program every morning, 3-4 (Wheatley).

VAS, Glace Bay, N.S., 652 kc. verifies reception (Loke).

WATL DX program, midnight—7 a.m. Sundays (Parfitt).

WBNY, a new station operating 7-8:30 a.m., 10 a.m.—2 p.m., 3 p.m.—midnight, daily (Kalmbach).

WCAX does not desire reports from listeners (Parfitt).

WEDC is silent on Tuesday mornings (Parfitt).