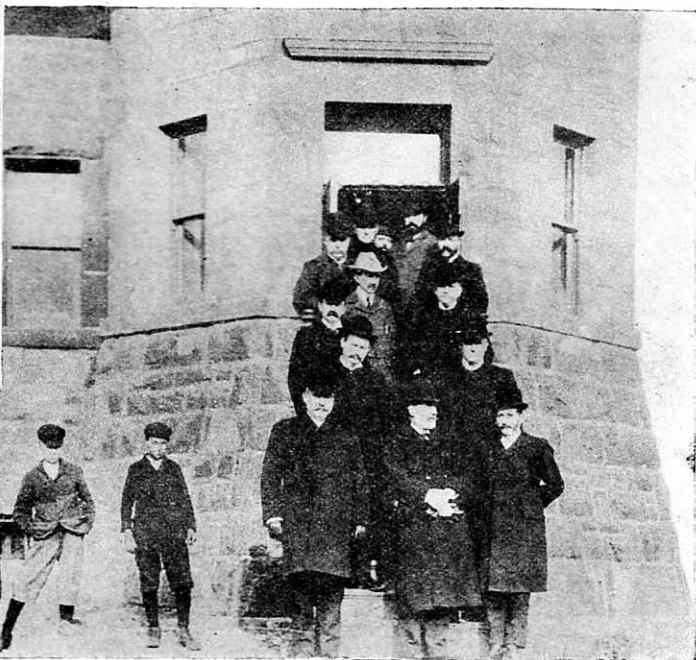
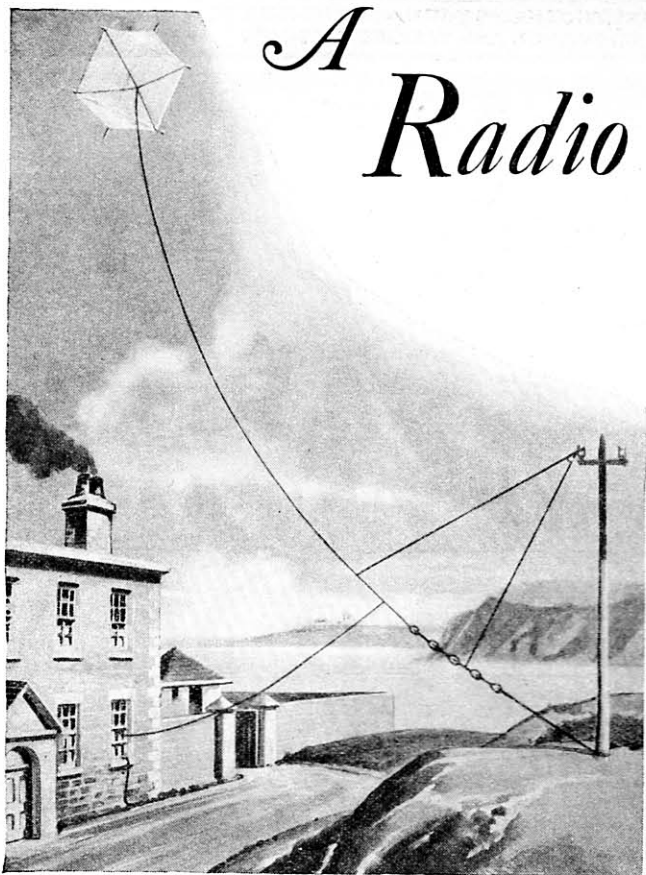


A Radio DREAM

By



Photographs by Courtesy Radio-Victor Corporation
(Upper left) A scene at St. John's, Newfoundland, showing Senatore Marconi's arrangement for using a kite to support the antenna which he used in his first experiments. (Left) The kite itself. (Above) A group of engineers at St. John's who witnessed the first tests.

Following is Senatore Marconi's address delivered from the London studios of the British Broadcasting Corporation and rebroadcast in the United States by the National Broadcasting Company.

THE EDITORS

IT gives me very great pleasure to recount to Americans through the courtesy of the National Broadcasting Company of America and the British Broadcasting Corporation my experiences at the time when I first attempted and, indeed, successfully, to send radio signals across the Atlantic Ocean twenty-eight years ago, almost to the very hour.

From the time of my earliest experiments I had always held the belief, almost amounting to an intuition, that radio signals would some day be regularly sent across the greatest distances on earth, and I felt convinced that trans-Atlantic radio telegraphy would be feasible.

Very naturally I realized that my first endeavor must be directed to prove that an electric wave could be sent right across the Atlantic and detected on the other side.

What was at that time a most powerful wireless station was built at Poldhu in England for this purpose and an antenna system was constructed, supported by a ring of twenty masts, each about two hundred feet high. In the design and construction of the Poldhu station I was assisted by Sir Ambrose Fleming, Mr. R. N. Vyvyan and Mr. W. S. Entwisle.

Another similar station was erected at Cape Cod in Massa-

chusetts. By the end of August, 1901, the erection of the masts was nearly completed when a terrific gale swept the English coasts, with the result that the masts were blown down and the whole construction wrecked. I was naturally extremely disappointed at this unforeseen accident, and for some days had visions of my test having to be postponed for several months or longer, but eventually decided that it might be possible to make a preliminary trial with a simpler aerial attached to a stay stretched between two masts 170 feet high and consisting of sixty almost vertical wires. By the time this aerial was erected another unfortunate accident, also caused by a gale, occurred in America, destroying the antenna system of the Cape Cod station.

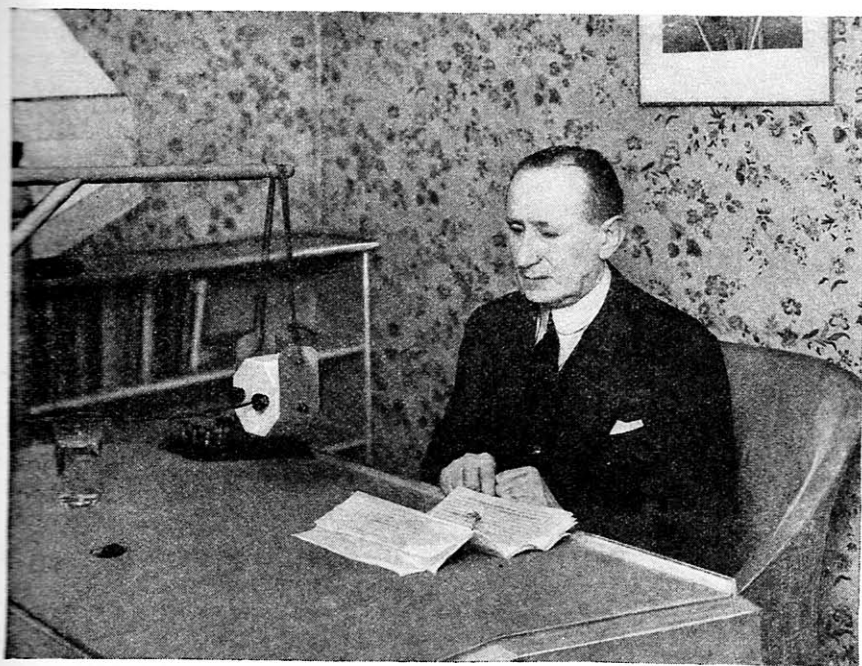
I then decided, notwithstanding this further setback, to carry out experiments to Newfoundland with an aerial supported by

ON December 12, 1929, Senatore Guglielmo Marconi, who sent the first wireless message across the Atlantic twenty-eight years ago, spoke into a microphone in London and his voice was heard throughout the United States. Graham McNamee, in New York, introduced Marconi to American listeners.

Engineers of the National Broadcasting Company and the Radio Corporation of America were successful in picking up a short-wave broadcast from Station G-5SW, at Chelms-

COME TRUE

Senatore Guglielmo Marconi



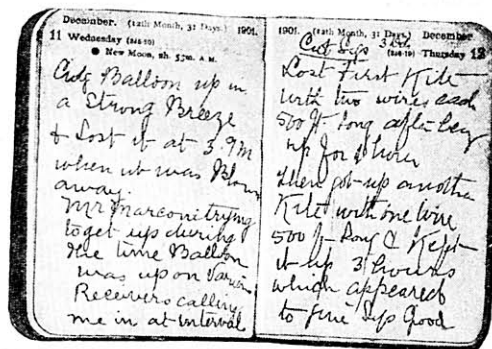
International program on short waves from England celebrates the twenty-eighth anniversary of the first successful trans-oceanic tests

Senatore Marconi broadcasting from the English broadcasting station G-5SW at Chelmsford

a balloon or kite, as it was clearly impossible at that time of the year, owing to the wintry conditions and the shortness of the time at our disposal, to erect high masts to support the receiving aerial. On the twenty-sixth of November, 1900, I sailed from Liverpool accompanied by my two technical assistants, Mr. G. S. Kemp and Mr. P. W. Paget.

We landed at St. Johns, Newfoundland, on Friday, December the sixth, and before beginning operations I visited the Governor, Sir Cavendish Boyle, and the Prime Minister, Sir Robert Bond, and other members of the Newfoundland government, who promised me their heartiest co-operation in order to facilitate my work. After taking a look round at the various sites, I considered that the best one was to be found on Signal Hill, a lofty eminence overlooking the harbor. On the top of this hill was a small plateau which I thought suitable for flying either balloons or kites. On a crag of this plateau rose the Cabot Memorial Tower and close to (Continued on page 849)

(Right) Photo of Marconi's log-book



(Left) Marconi and his two assistants, Mr. G. S. Kemp and Mr. P. W. Paget

ford, England, of Marconi's voice, and it was rebroadcast through a chain of forty-six stations extending as far west as Denver. The short-wave signals were picked up at Riverhead, Long Island, and then routed to the New York NBC studios and the network. The rebroadcast was the sixth successful attempt of this organization to rebroadcast a program from abroad. WFAF and WJZ were the New York outlets.

A Radio Dream Come True

(Continued from page 785)

it was an old military barracks. It was in a room of this building that I set up my receiving apparatus in preparation for the great experiment.

On Monday, December 9th, barely three days after my arrival, I and my assistants began work on Signal Hill. The weather was very bad and very cold. On the Tuesday we flew a kite with 600 feet of antenna wire as a preliminary test, and on the Wednesday we had inflated one of our small balloons, which made its first ascent during the morning. Owing, however, to the strength of the wind, the balloon soon broke away and disappeared in the mist. I then concluded that perhaps kites would answer better, and decided to use them for the crucial test.

I had arranged with my assistants in Cornwall to send a series of "S's" at a prearranged speed during certain hours of the day. I chose the letter "S" because it was easy to transmit, and with the very primitive apparatus used at Poldhu I was afraid that the transmission of other Morse signals, which included dashes, might perhaps cause too much strain on it and break it down. Mr. Entwisle, Mr. George and Mr. Taylor were in charge of the English station at Poldhu during the transmission of signals to Newfoundland.

On the morning of Thursday, the twelfth of December, the critical moment for which I had been working for so long at last arrived, and, in spite of the gale raging, we managed to fly a kite carrying an antenna wire some 400 feet long. I was at last on the point of putting the correctness of my belief to the test! Up to then I had nearly always used a receiving arrangement including a coherer, which recorded automatically signals through a relay and a Morse instrument. I decided in this instance to use also a telephone connected to a self-restoring coherer, the human ear being far more sensitive than the recorder.

Suddenly, at about half-past twelve, a succession of three faint clicks on the telephone, corresponding to the three dots of the letter S, sounded several times in my ear, beyond the possibility of a doubt.

I asked my assistant, Mr. Kemp, for corroboration if he had heard anything. He had, in fact, heard the same signals that I had.

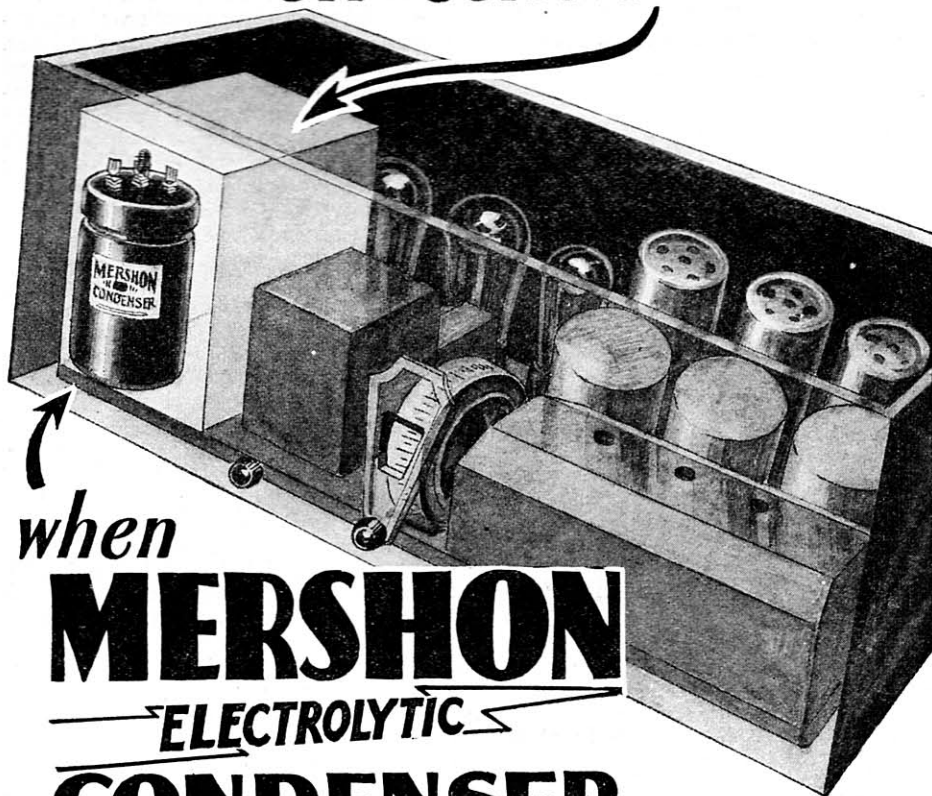
I then knew that I had been justified in my anticipations. The electric waves which were being sent out into space from Poldhu had traversed the Atlantic, unimpeded by the curvature of the earth which so many considered to be a fatal obstacle, and they were now audible in my receiver in Newfoundland!

I then felt for the first time absolutely certain that the day when I should be able to send messages without wires or cables across the Atlantic and across other oceans and, perhaps, continents, was not far distant. The then enormous distance, for radio, of 1,700 miles had been successfully bridged.

On the following day the signals were again heard, though not quite as distinctly. However, there was no further doubt possible that the experiment had succeeded.

(Continued on page 850)

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A Radio Dream Come True

(Continued from page 849)

The result was much more than the mere successful realization of an experiment. It was a discovery which proved that, contrary to the general belief, radio signals could travel over such great distances as those separating Europe from America and it constituted, as Sir Oliver Lodge has stated, an epoch in history.

It must be remembered that at that time there was no suggestion of the existence of the Heaviside-Kennelly layer, nor of the reflection of electric waves from the higher regions of the atmosphere. The instruments we had at our disposal were very crude compared with those we have today. We had no valves or tubes, no amplifiers, no sensitive super-heterodyne sets, no directional transmitters and receivers, and no means of making continuous waves. All we had for transmitting was the means of making crude damped waves by means of irregular spark discharges. The receivers that were then employed were insensitive as compared with those of the present day.

Following the success of the test I was promptly notified by the Anglo-American Telegraph Company that, as they had the exclusive right to construct and operate stations for telegraphic communication between Newfoundland and places outside that colony, the work upon which I was engaged was a violation of their rights. I was asked to give an immediate promise not to proceed with my experiments and to remove my apparatus or legal proceedings would be taken. I was absolutely astounded by this communication, which, however, at least gave me the satisfaction of knowing that one of the great cable companies not only believed in my success but feared the competition of radio trans-Atlantic communication.

I mention this to show why my experiments in Newfoundland were thus cut short. When, however, the reason became known, I received a very cordial invitation from the government of Canada to erect a station in Nova Scotia, an offer which I gladly accepted.

The announcement that I had succeeded in transmitting radio signals across the Atlantic was received with scepticism by

most scientists, principally in Europe. The same thing cannot be said of American electrical engineers, for the American Institute of Electrical Engineers was the first technical and scientific body which believed in me and my statement of having received signals across the Atlantic Ocean. It was the first distinguished and authoritative society enthusiastically to celebrate the event and to extend to me its generous support and valuable encouragement. It celebrated the occasion by a dinner given to me in New York, at which most distinguished American scientists took part, including men whose names were and still are household words in electrical science, such as Dr. Alexander Graham Bell, the inventor of the telephone, Professor Elihu Thomson, Dr. Steinmetz, Dr. Michael Pupin, Mr. Frank Sprague, and many others. In less than three months from the date of the tests to Newfoundland these long-distance results were more than confirmed by experiments carried out by myself on the S.S. *Philadelphia* of the American Line.

Spanning great distances is now child's play compared with what it was then. The 1-beam projector and other commercial radio telegraph and telephone stations are now exchanging daily hundreds of thousands of words between distant parts of the earth. Wireless telephony over world-wide distances is now a reality, together with transmission of pictures, and the day is approaching when television will also be a commonplace. It may even be that the transmission of power over moderate distance may be developed in the not far distant future. I must leave to your imaginations the uses which can be made of these new powers. They will probably be as wonderful as anything which we have experienced so far.

Mr. Kemp and Mr. Paget are with me at the microphone today while I am addressing you, and I wish to send my most cordial greetings to all those interested in radio in America (I feel sure they form the majority of the American people) and to all my friends at the other side of the Atlantic.

A New Tool for the Serviceman

(Continued from page 808)

meter ranges are indicated in Fig. 4. Binding posts were placed at point "m." These binding posts are short circuited during normal use. If, however, we wish to cover a range such as 0-1 volt with a full-scale deflection, the jumper is removed and a zero to two hundred micro-ammeter substituted.

Since this meter can be used on either a.c. or d.c., we may calibrate on d.c. and use it on a.c. A distinct advantage of the method used to multiply the range is that it can be calibrated at any one range and will then be accurate for all ranges. It is of course understood that the input resistances should be exact in

values. A good d.c. voltmeter of convenient range may be used in calibrating.

The finished instrument will come in handy in any experimental laboratory where an exact knowledge of circuit behavior is desired. It can be used to measure the gain of audio amplifiers, radio amplifiers, total gain of sets, loud speaker performance, microphone characteristics, and for a great many other measurements. Through its use we can find out how an amplifier behaves at different frequencies and with different circuit characteristics.

A future article will explain how some of these measurements can be made.