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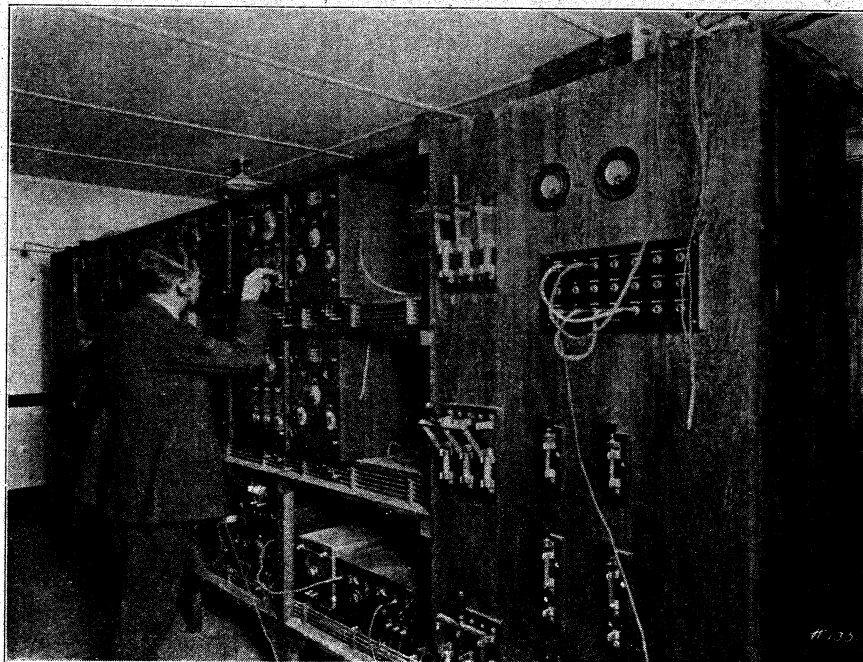
Radio Central



A Paper Presented by *Pierre Boucheron* at meeting of Radio Club of America, Columbia University, January 27, 1922

OUR subject for this evening is to be pictorial rather than technical. I have therefore prepared a short paper based chiefly on the outstanding facts of the big station. I will first read this paper to you and then we shall proceed with the pictorial section. For this we have a number of slides featuring the most prominent sites and apparatus

end entirely. Here we have a huge station built by a commercial concern for a distinctly commercial purpose. My only excuse, therefore, is that the real radio enthusiast, whether an amateur or a professional (and by the way many of us here this evening are professionals) is vitally interested in everything concerning radio. Indeed, one has only to pick up the average radio magazine



Receiving Shelf at Riverhead, L. I.

at Radio Central. We will follow this by a short reel of moving pictures depicting several interesting construction scenes and other incidents connected with the station, followed by some views taken on the official opening day, November 5, 1921.

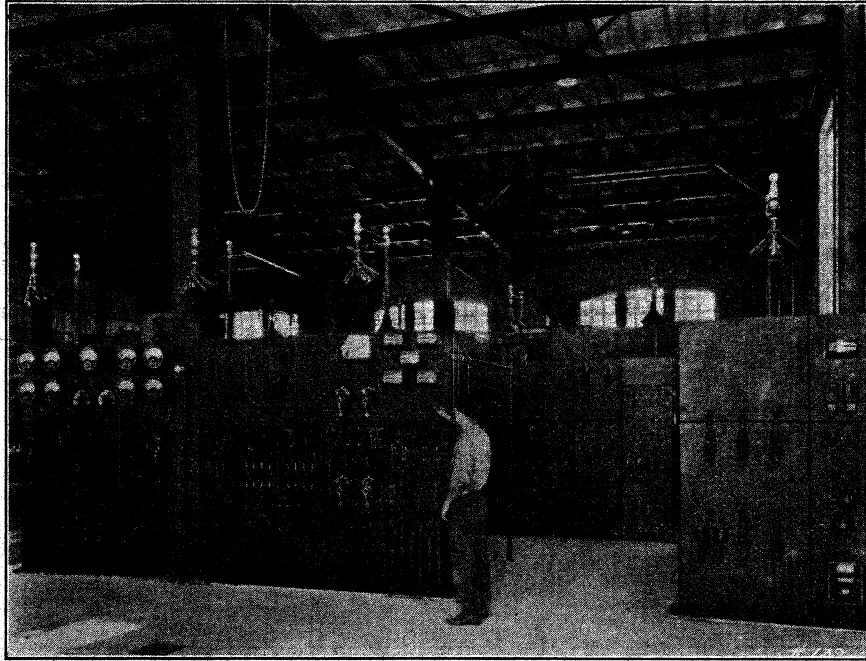
Before we proceed, we shall indulge in a few preliminary remarks. Some of you may wonder why the subject of the evening should be brought up before an amateur organization, for at first thought the activities of Radio Central are essentially commercial ones, and this paper deals with that

and glance through the pages to note the many and frequent descriptions of strictly commercial apparatus or plants originating not only in this country but throughout the world as well. This undoubtedly proves that the average radio amateur is interested in other subjects besides the strictly experimental one.

Then too we have in Radio Central perhaps the greatest radio project in the history of the art. In order that we may bring home the significance and the importance of this latest of American under-

takings, a little history is possibly not out of place here. For many years, England has enjoyed the unique position of being the sole arbiter of the world's communi-

world wide wireless communication. This means that existing radio and cable facilities to such leading commercial nations as Great Britain, France, Norway and Ger-



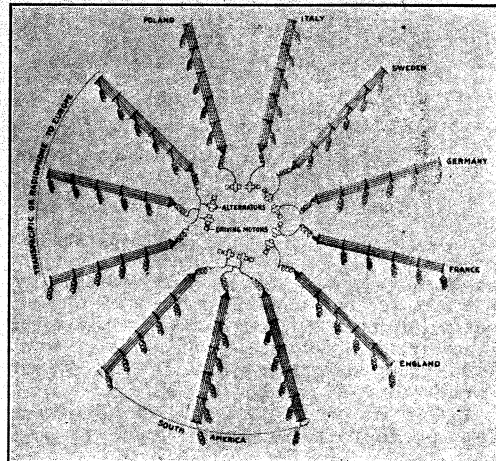
Main Control Switchboard at Radio Central

tion. She has been so to speak the center of communication—cable communication. You have but to look at any communication map to have this fact demonstrated to you in a most conclusive manner. Here you will see the great cables of the world stretching out far and wide to the most remote corners. Incidentally, you will see this giant network of lines merge into one general direction or focal point—that of England. I am not here to tell you that England is to be censured for this. On the contrary, any other nation would have done likewise if placed in the same advantageous position, and it is only natural to expect this. These factors and the fact that the United States has not had adequate means of international communication have not particularly helped us to develop foreign trade. It was quite natural therefore that shortly after the great war, it was decided that if England was the center of cable communication, there was no reason why the United States should not be the center of radio communication. It was thus that Radio Central was conceived—a 100% American owned, controlled and operated wireless central point with facilities for world-wide wireless communication.

With the opening of Radio Central, therefore, New York becomes the focal point of

many are now supplemented by a *direct* radio telegraph service.

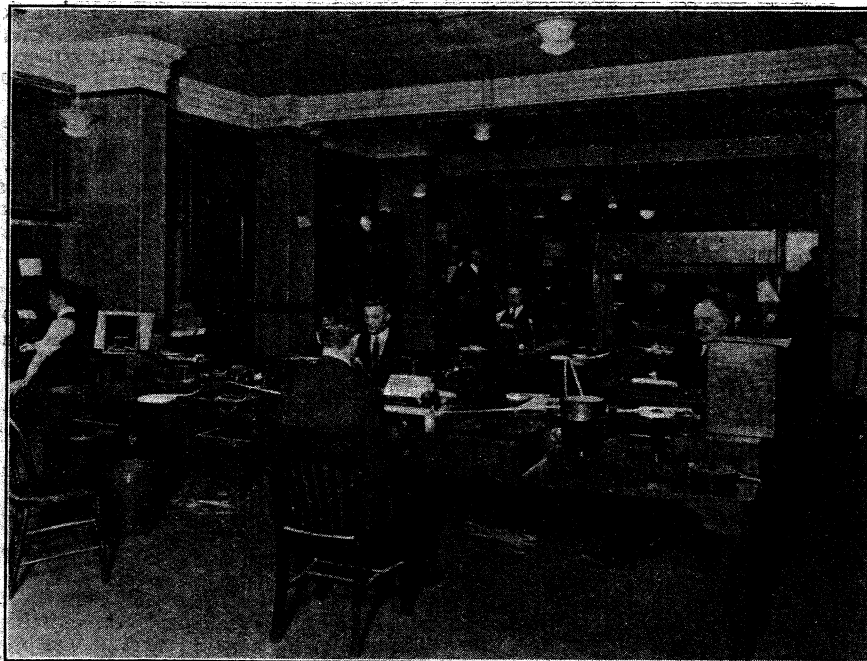
Commerce, as we know it today, depends upon complex and highly specialized factors



The Antenna Combination

for success. One of its most important agencies is communication, bringing, as it

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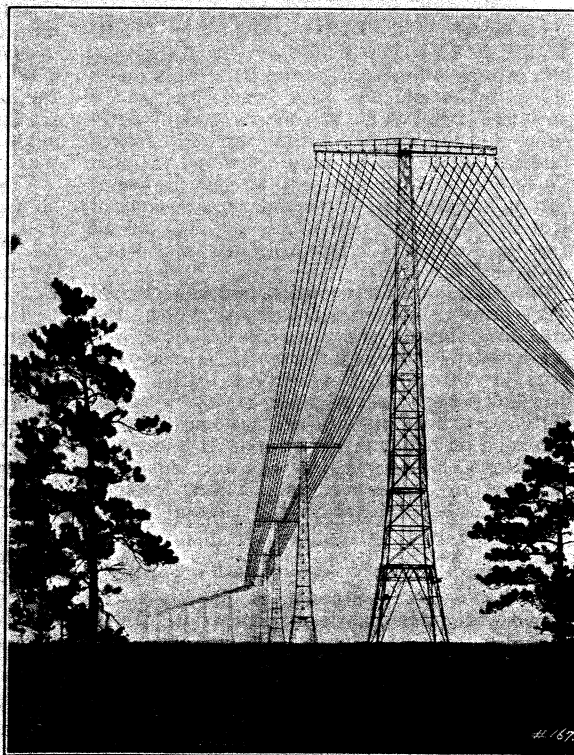
Above: Main Operating Room at New York.
Below: One leg of the antenna.

does, the marts of the world within easy reach of all. Indeed, without this vehicle world trade would fail utterly. Thus it has come to pass that the art of radio communication has slowly but surely taken its place as a necessary supplement to present cable circuits, and not only is Europe and the Orient covered by the radio system but the new station recently opened has been designed to eventually provide an additional and direct circuit to South America, thereby linking all commercial nations together.

Radio Central—Its Purpose and How It Functions

Unlike many industries, radio communication is essentially international in its operation and world wide in its scope. For this reason it has been the dream of communication engineers for several years to erect a huge transmitting station at a centrally located point in such wise as to command a world wide field of activity. Radio Central is the realization of this vision.

In the pioneer days of high power radio telegraphy, a station functioned alternately as a transmitter, a receiver and a telegraph



office. This involved much loss of time and greatly reduced traffic facilities, for a station had to stop sending while it received and vice versa. It, therefore, became apparent that the ideal radio station should comprise three separate but closely connected units operating by remote control and employing a transmitting unit, a receiving unit and a central traffic office, the latter preferably in the heart of the business district of large cities. The Radio Corporation has had this system in operation for some time and having found it most effective has incorporated it in the operation of Radio Central and other trans-Atlantic stations.

The new radio station, therefore, comprises these three units which are:

RADIO CENTRAL—A high power multiplex transmitting station located on Long Island some distance from New York City, planned to have several separate antenna systems each designed to communicate with a given country with remote telegraphic control from a point suitable to the handling of traffic.

RIVERHEAD, L. I.—A multiplex receiving station also located some distance from New York but separated by sixteen miles from the transmitter and so planned and arranged as to simultaneously receive all radiograms destined to the United States from as many foreign countries as take part in the world wide wireless system.

CENTRAL TRAFFIC OFFICE, NEW YORK CITY—The traffic center of the system where all actual radio telegraph operating takes place. Here radiograms are gathered from various sources and directly radioed to foreign points through Radio Central and other high power stations. This direct transmission is accomplished through the use of a special remote control system whereby operators at 64 Broad Street, New York City, do all necessary transmitting work.

In a like manner reception is accomplished with similar direct advantages where the incoming signals are made audible at Riverhead, L. I., and automatically transferred over land-lines to the central traffic office located in the heart of New York's financial district. These signals are interpreted and recorded on typewriters by skilled telegraph operators at high speed or are automatically received by ink-recorders. Final delivery is then effected through the regular messenger service.

Outstanding Facts About Radio Central

Radio Central Station is designed for world-wide wireless communication which includes Europe, South America and the Far East. This Super-Station is situated at Rocky Point (seven miles east of Port Jefferson) on the northern shore of Long Island, seventy miles from New York City. The station site covers 6,400 acres or 10

square miles. The construction began in July, 1920, and the first test signals were sent in October, 1921, a little more than a year later, a record in itself when one considers the great amount of work accomplished. 1,800 tons of structural steel were used to erect the first twelve towers, each employing approximately 150 tons. Each tower is 410 feet in overall height and the cross arm or bridge supporting the antenna wires at the top is 150 feet long. 8,200 tons of concrete were employed for the foundations of the twelve towers, the base of each tower leg being sunk nine feet below the ground with a total base area of 360 square feet. The distance between two adjacent towers is 1,250 feet or nearly three miles from the first to the twelfth tower.

Each antenna consists of sixteen silicon bronze cables $\frac{3}{8}$ inches in diameter stretched horizontally from tower to tower. In all, fifty miles of this cable has been used for the first two antenna systems. The ground system for both antennae consists of 450 miles of copper wire buried in the ground in starfish and grid-iron fashion. The first power-house section covers a space of 130 feet by 60 feet and accommodates two 200 K.W. high frequency transmitting alternators with auxiliaries and equipment. A sending speed of 100 words per minute is possible with the use of each transmitting unit at Radio Central. This means a combined sending capacity of 200 words per minute for the two completed units. The present wave length in use is 16,500 meters. The erection of additional antenna units forming the spokes of the huge wheel and further improvements which are being made will correspondingly increase the transmitting capacity of the big station.

The transmitting range of Radio Central is practically world wide, as demonstrated at the official opening when the station was heard in all parts of Europe, as well as Australia, South America, Japan, and New Zealand.

The cooling pond for cooling the water after it has circulated through the high speed alternators covers a ground space of 64 feet by 42 feet and is 7 feet deep. The pond is equipped with four spray heads which, when operating, present a beautiful and ornamental appearance.

The community house for the staff is a low one-story building closely resembling an exclusive country club. It contains sixteen single rooms, an official suite, a large living room and dining room as well as quarters for servants. The engineer in charge with a staff of fifteen assistants comprises the personnel necessary to maintain the huge station in operation at present. The 23,000 volt transmission line was built from Port Jefferson to the station, a distance of seven miles. There are no radio operators at Radio Central, the actual transmission taking place by remote control

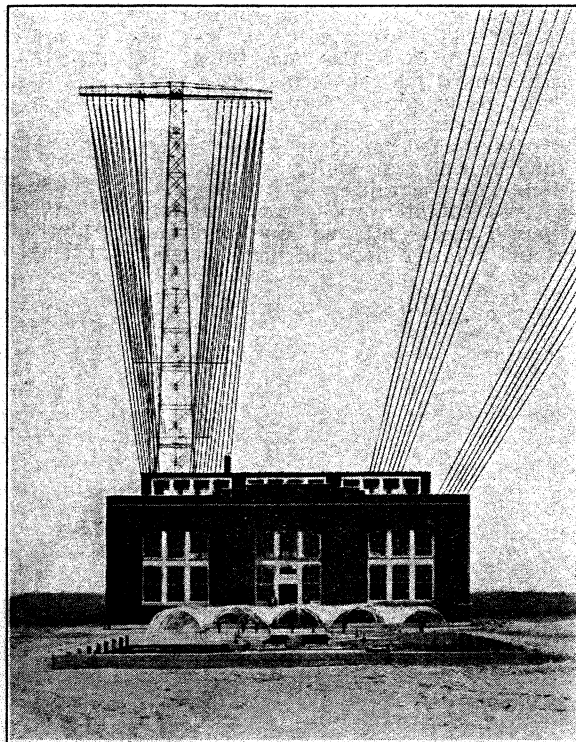
from the Central Traffic Office at 64 Broad Street, New York City.

The receiving station working in conjunction with Radio Central is located at Riverhead, L. I., sixteen miles away. No operators are located here, for the distant signals are first received by radio, automatically transferred to wire lines and received at audible tones at the central traffic office, New York City. The action is automatic from the time the signals are transmitted abroad, picked up by the aerial, to the moment of actual transcribing by the receiving operators in New York.

The final installation at Radio Central will comprise twelve antenna units supported by 72 towers, forming so to speak the spokes of a giant wheel nearly three miles in diameter. Ten high-frequency alternators will be employed which in total will give a power output of 2,000 kilowatts or 2,700 horsepower. The electrical force thus brought into play at Radio Central permits the realization of the vision of communication engineers to transmit messages to all points of the world from a *single* centrally-located source.

The station was officially opened by President Harding on November 5, 1921 who took advantage of the occasion by sending a message addressed to the entire world. The sending of this message was accomplished as follows. It was first punched out on a tape by means of the Kleinschmidt perforator and then passed through a Wheatstone automatic transmitter. At a given moment, the President closed a switch near his desk at the White House and the message sped on its way from Washington to Rocky Point via the medium of a direct wire connected to the sending relay at Radio Central from where of course it was broadcasted. Something like thirty-three nations heard the President's message and these immediately acknowledged it by means of the quickest available method. Some of course, not being equipped with high power transmitters, cabled their reply but the majority came by radio. Incidentally, a world record for long distance radio communication was established at this time when far-off Auckland, New Zealand, a distance of over 10,000 miles, easily copied the message and reported the signals quite strong and reliable.

An interesting contrast to this record transmission is furnished us by some remarks exchanged between Guglielmo Marconi and a reporter twenty-five years ago



The Power House at Radio Central.

during an interview shortly thereafter published in McClure's Magazine for March, 1897:

—“And how far do you think a despatch could thus be sent?”

“Twenty miles!” (replied Mr. Marconi).

“Why do you limit it to twenty miles?”

“I am speaking within practical limits, and thinking of the transmitter and receiver as thus far calculated. The distance depends simply upon the amount of the exciting energy and the dimensions of the two conductors from which the wave proceeds.”

Twenty miles in 1897—10,000 miles in 1922. In the comparatively short span of 25 years, radio communication has certainly made tremendous progress.

There is another little matter too which may have occurred to you and this has to do with the recent trans-Atlantic amateur test. Mr. Godley had no sooner assured us that amateur short wave communication across the Atlantic was an accomplished fact that some of the general public began to ask “how come” the fact that amateurs could with their “home made” sending sets send across the Atlantic with as low as a

50-watt tube when it took the commercial stations 200 kilowatts more or less of electrical energy to do the same thing. It has been a hard job convincing these wise folks that telegraphing across the pond with comparatively small power at a special prearranged period at a most favorable time of the year under best possible conditions was one thing and to telegraph across the Atlantic with comparatively great power under all and any condition, winter and summer day and night and at

high speed was quite another proposition. To you of course, familiar as you are with the wiles of radio, it is quite understandable but it is a different thing to prove it to the casual observer. I bring it to your attention only because to some it may seem rather incongruous to feature Radio Central at this time when we have not yet recovered from the glorious achievement of American amateur radio and its international communication possibilities.

