



SPANNING A CONTINENT



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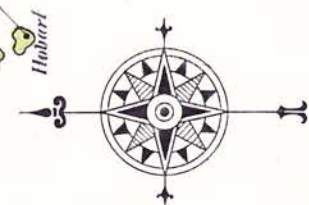
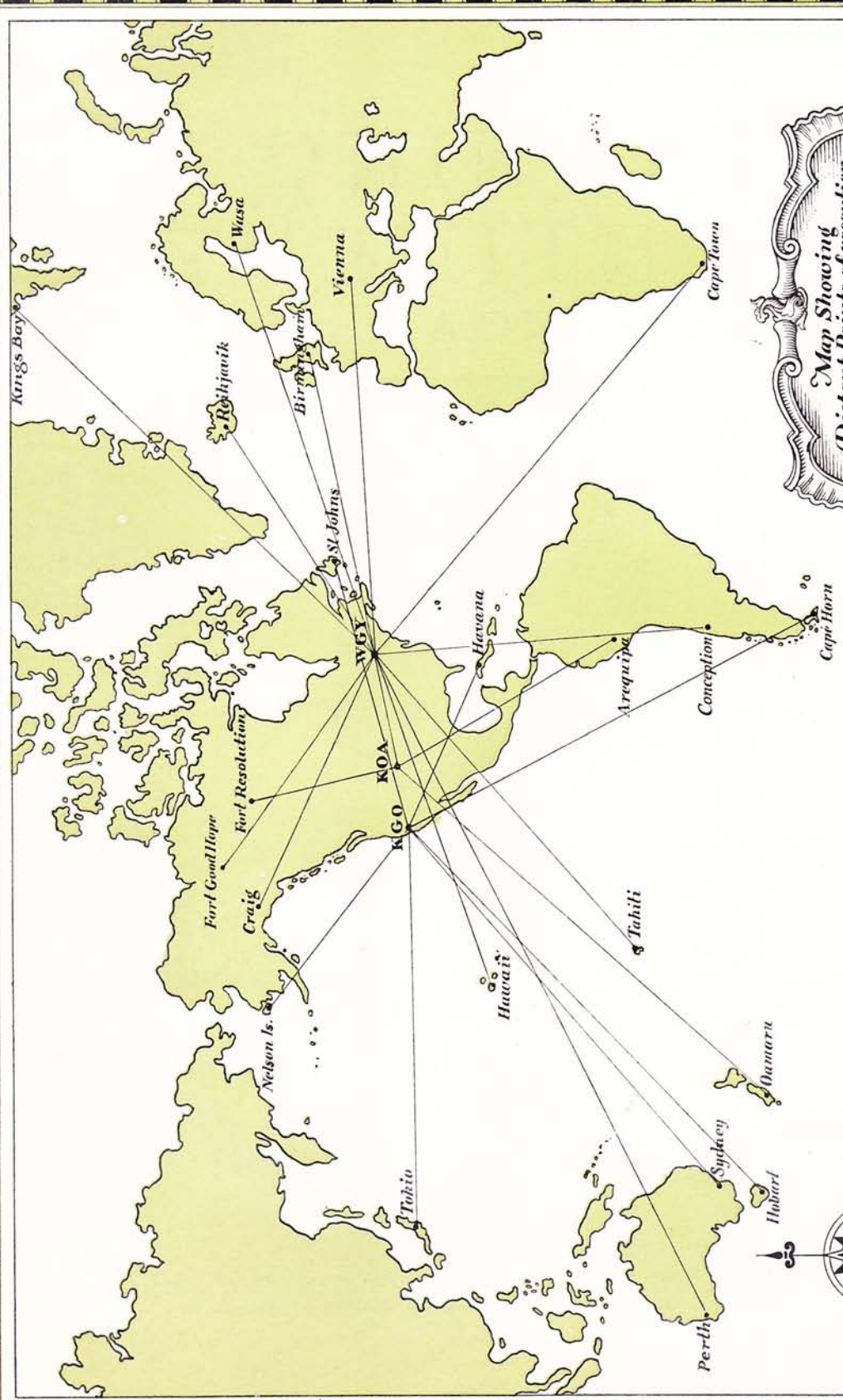
WGY *~* KOA *~* KGO



GENERAL ELECTRIC

GEA-268

Map Showing
Distant Points of reception
WGY - KOA - KGO
GENERAL ELECTRIC
Broadcasting Stations



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WGY KOA KGO



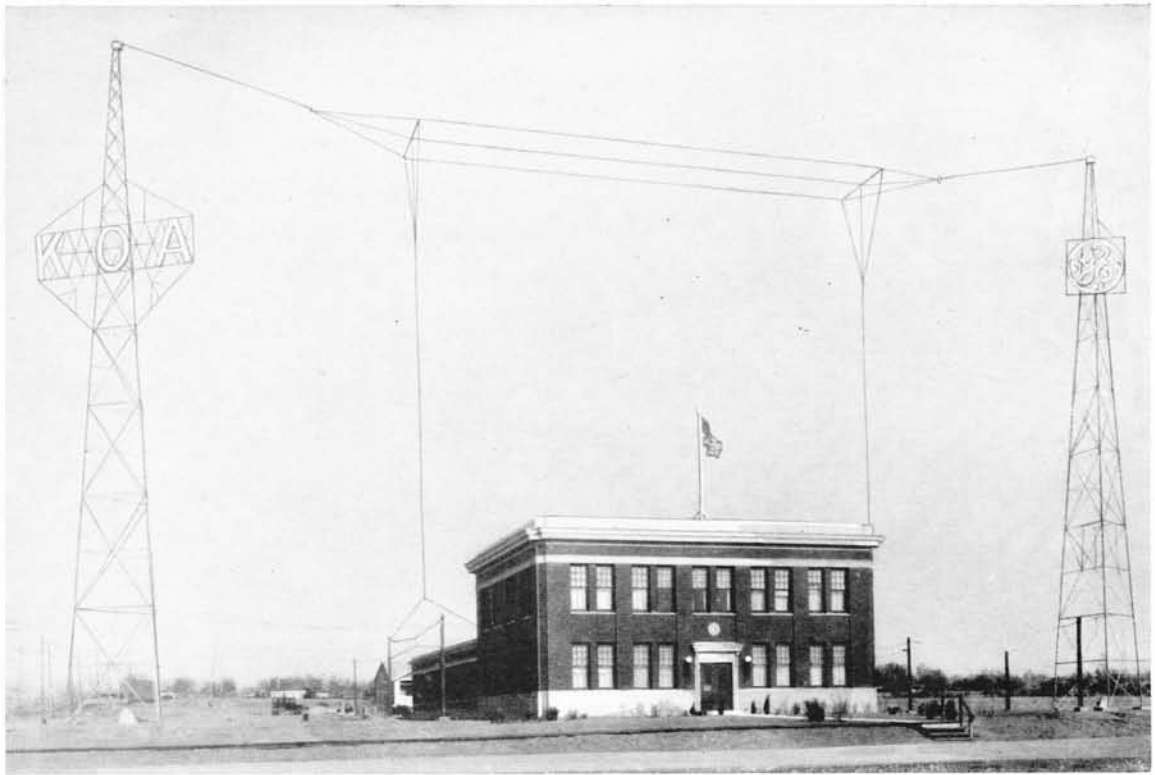
MAIN STUDIO, WGY, SCHENECTADY, NEW YORK

NOT many years ago, a vast but widely scattered people could listen to its statesmen and scholars only at long intervals and after tedious travel. Worthy music and fine entertainment were available to relatively few. Thousands—invalids and the isolated—who longed to attend the services of the church were denied the opportunity. Market and weather reports, especially important in agricultural areas, were frequently so delayed as to lose all timely value.

Today, the words of famous men and learned go out to the end of the world; no American fireside is so remote that there musicians may not give songs in the night; common worship is held in the wilderness home and by the sick bed; almost on the harvest field, official forecasts are published and the latest advice is spoken from centers of trade.

These attainments of radio broadcasting are a part of the program to which the General Electric Company has contributed three great stations that span the American continent—WGY, at Schenectady; KOA, at Denver; and KGO, at Oakland. These stations have established a continuous zone of broadcasting in which they are helping to satisfy vital intellectual needs of multitudes who must, in large part, depend on radio for a share in the finer compensations of life.

Only dwellers in large cities can be present, frequently and conveniently, at symphony concerts, opera, and the rendition of other important instrumental and vocal works of the



KOA ROCKY MOUNTAIN BROADCASTING STATION, DENVER

masters. Our three stations have undertaken to make great music a familiar thing in the most remote villages. Where it is not practicable to broadcast it from the studios, the stations reach out to the nearest important musical center, by means of pick-up circuits, and select from concert hall or stadium a rich gift of musical culture for an entire people.

In the field of literature, the General Electric studios admit a national audience to lectures by educators, savants, and those who write books as well as study them. Without intent or desire to substitute radio instruction for systematic courses in common schools, our stations do open avenues to knowledge that is beyond the easy reach of most rural dwellers and of thousands who live in cities. Reviews of new books, original accounts of travel, and authoritative scientific talks add variety, inspiration, and intellectual value to the broadcast programs.

For lovers of the drama and those who have few opportunities to experience the fine thrill of good plays well acted, the three stations unite in erecting a theater in every home. Standard productions adapted to broadcasting are presented by companies of trained actors at whose hands the "radio drama" stimulates the listener's imagination to a point which leaves little for the eye to desire.

The finest gift of radio to man is the extension of spiritual culture through the broadcasting of religious services. To the devout, there are few heavier trials than enforced absence from church; to invalids, it is often a crowning calamity. Week after week, the Sunday worship of many churches is now sung and spoken in the ears of all who will "hearken unto the Lord."

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If our broadcasting stations had no other mission than to be ministers of this great consolation, they would amply have justified the research that gave them existence and the careful skill that is devoted to their operation.

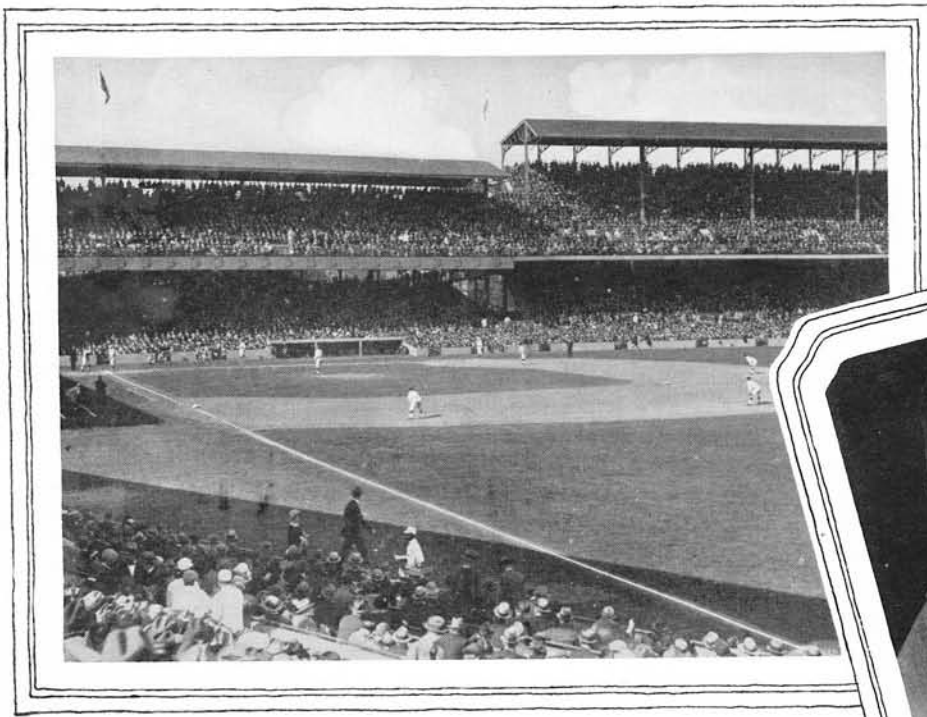
No printed address can have the force or fascination of words actually spoken. America's statesmen—her executives and legislators—are broadcasting their messages of counsel and information to the public; our stations are used to carry their very speech to the ears of vast constituencies. Not otherwise could a democracy of over a hundred million be brought into personal touch with its chosen public servants or so accurately weigh political values.

Thus also do the stations of the General Electric Company enable the electorate to attend party conventions and public meetings. Nomination speeches are made at the rural crossroads, and decisive ballots are registered in the very presence of those who delegated this power. Civic and scientific bodies meet before a public that no hall could hold, and academic exercises become agencies of immediate edification in many homes. Election returns are broadcast as soon as they are determined; produce and stock market reports are made daily; major athletic and sporting events are reported from the field; and material assistance is rendered in finding lost persons and in apprehending criminals.

This service of information is supplemented by series of talks on public health, personal hygiene, and other topics of general interest, delivered by government experts and specialists in the respective fields. One of the most valuable contributions to practical knowledge is the regular broadcasting to farmers of information as to agricultural methods and markets and weather forecasts—a matter of the highest importance, especially at harvest time.



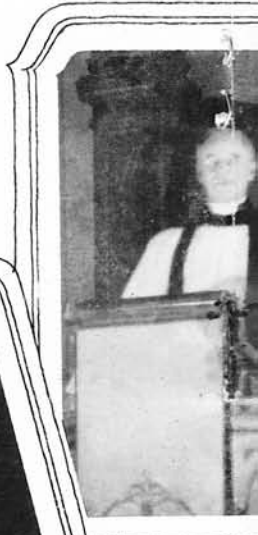
STUDIO AT KGO, OAKLAND, CALIFORNIA



Sports—World Series Baseball Game



Exploration—Vilhjalmur Stefansson



Religion—Dr. B.



Education—Helen Keller



Music—Concert of the New York Philharmonic

INTEREST FINDS EXPRESSION IN RADIO



igion—Dr. B. W. R. Tayler



Science—Luther Burbank



Football Game in Yale Bowl



ilharmonic Symphony Orchestra in Lewisohn Stadium



Government—Hon. Alfred E. Smith, Governor of New York

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The refreshment of bright, clean entertainment is a general necessity for a hard-working, nervously tense people; the lack of it has been a serious discouragement to life in small communities and more especially in isolated farm homes. From the very first, the General Electric stations have made their programs contribute—frankly and heartily—to the joy of living as well as to its more serious aspects. The sparkle of popular melody and operetta, the lilt of dance music, the mental seasoning of humor and jest, all these occupy an honorable place in our broadcasting; in thousands of remote places they bring literal fulfillment of the vision:

“And the night shall be filled with music,
And the cares, that infest the day,
Shall fold their tents, like the Arabs,
And as silently steal away.”

Popular radio broadcasting has not yet reached its growth. The General Electric Company is co-operating with Federal authorities and with experimental engineering interests in a far-reaching program of development. In the measure that the use of increased power is proved to be of common advantage—as the interlocking of stations becomes increasingly practicable—as new devices for neutralizing unfavorable natural conditions are perfected—to that degree will WGY, KGO, and KOA reflect scientific advance in the clarity and reach of their broadcast programs.

We turn from a fruitful past to a future of high promise, confident in the belief that “the best is yet to be.”



EXTERIOR KGO, OAKLAND STATION



KOA POWER HOUSE ROOM

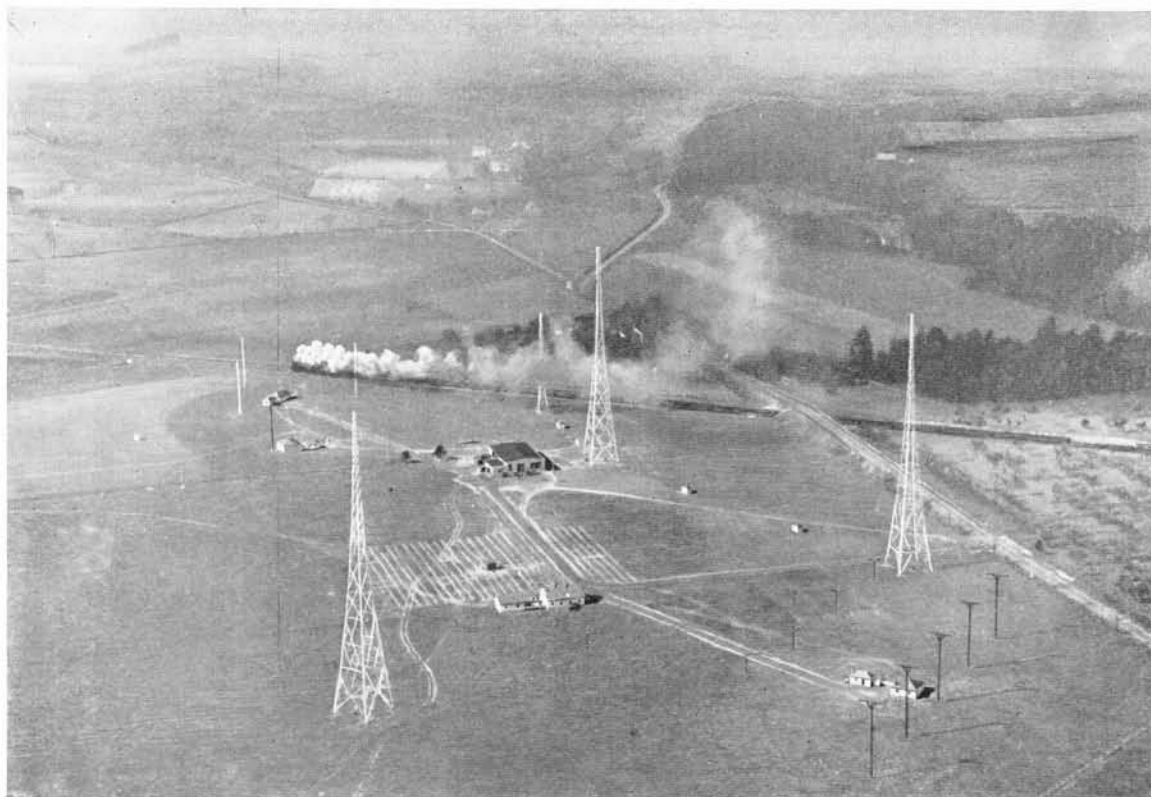
A FEW TECHNICAL DETAILS

The stations of the General Electric Company have been located with a view of maintaining high standards of broadcasting and of serving, as far as practicable, the peoples of all the states. Fundamentally, they are equipped with the same type of apparatus, but in all of them, alterations are still being made and new equipment is being added.

Each station is provided with two independent radio transmitters. Service is thus continued through one channel while improvements are being made in the other. Each station has one transmitter uniform with the spare transmitters at the other stations and one that is being revised to keep step with technical progress.

The common type employs one metal-type water-cooled pliotron, in a special oscillating circuit, arranged to keep the transmitted frequency substantially constant. This pliotron oscillator, in combination with a "tank circuit," converts high-voltage direct current into high-frequency alternating current, which is transferred through coupling coils to energize the antenna. The antenna is of the multiple-tuned type, consisting of two sections which are tuned to resonance with an elevated counterpoise ground. The conventional arrangement of step-up transformer and kenotron rectifier is used to develop the high-voltage direct current necessary for conversion by the pliotron.

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DEVELOPMENTAL STATION AT SOUTH SCHENECTADY

We now turn to the equipment that controls or moulds this radio power into the modulated waves that carry speech and musical impressions. At our stations, the sounds to be broadcast are "picked up" by means of very sensitive high-quality condenser microphone transmitters. These devices convert the sound waves into minute changes in electric voltage, which are amplified through several stages of resistance capacity amplification. This audio power is then transferred to the radio room where, through the combination of two tubes of the same type as the pliotron oscillator and a reactance, it controls—in proportion to the energy in the audio power—the amount of high-frequency energy generated by the pliotron oscillator. The two tubes are termed modulators, and the system is called constant-current modulation.

At KGO, the second radio transmitter is a duplicate of the original transmitters supplied to each station. At KOA, a master oscillator transmitter employing six metal tubes has been installed; this has been designed to hold the frequency to an even finer degree than the original equipment. WGY has a quartz crystal oscillator which maintains absolutely constant carrier frequency.

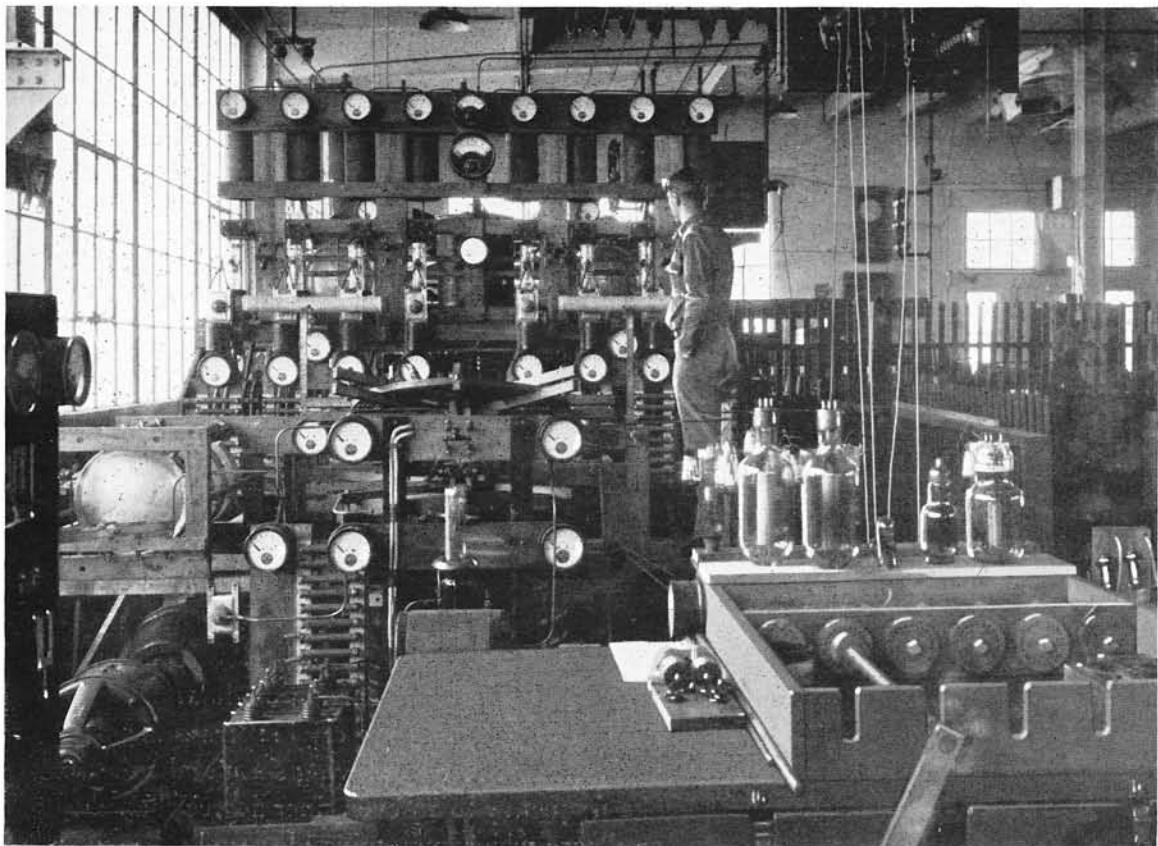
For the purpose of scientific experiment and development, the Radio Engineering Department of the Company has erected a large developmental station near Schenectady. This station is equipped to transmit on wavelengths between 15 meters and 1600 meters.

The developmental station has been broadcasting, simultaneously with WGY, programs on three wavelengths—2XAF on 32.79 meters, 2XK on 109 or 65 meters, and 2XAH on 1500

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meters. The two short-wave stations have been heard in Europe, South Africa, New Zealand, Australia, and South America. This station also transmits at regular intervals the WGY programs with an antenna power of 50 kilowatts. This was the first station equipped for 50-kilowatt broadcasting and the first station authorized by the Department of Commerce to test higher power.

This station affords opportunity for frequent changes of apparatus and for tests and experiments that are adding daily to accurate knowledge of radio phenomena. It also serves as a laboratory for testing and developing new apparatus and systems for the further improvement of broadcasting. Precision frequency indicators, volume indicators with volume controls, distortion-checking equipment, microphone equipment for pick-ups outside the studio, and many other devices essential to a radio broadcasting station present interesting problems which are receiving constant attention by engineers of the General Electric Company.



50 KW. EXPERIMENTAL BROADCASTING TRANSMITTER

GENERAL ELECTRIC COMPANY

GENERAL OFFICE: SCHENECTADY, N. Y.

SALES OFFICES (Address nearest Office)

| | | | |
|-------------------------|-----------------------------|---------------------------|------------------------------|
| Akron, Ohio..... | 159 South Main Street | Louisville, Ky..... | 455 South Fourth Street |
| Atlanta, Ga..... | 123 Spring Street | Memphis, Tenn..... | 130 Madison Avenue |
| Baltimore, Md..... | 39 West Lexington Street | Milwaukee, Wis..... | 425 East Water Street |
| Birmingham, Ala..... | 602 North Eighteenth Street | Minneapolis, Minn..... | 107 Fifth Street, South |
| Bluefield, W. Va..... | 104 Federal Street | Nashville, Tenn..... | 234 Third Avenue, North |
| Boston, Mass..... | 84 State Street | Newark, N. J..... | 20 Washington Place |
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| Chattanooga, Tenn..... | 536 Market Street | Omaha, Neb..... | 409 South Seventeenth Street |
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| Cincinnati, Ohio..... | 215 West Third Street | Phoenix, Ariz..... | 11 West Jefferson Street |
| Cleveland, Ohio..... | 925 Euclid Avenue | Pittsburgh, Pa..... | 535 Smithfield Street |
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| Duluth, Minn..... | 14 West Superior Street | San Francisco, Cal..... | 116 New Montgomery Street |
| Elmira, N. Y..... | 342 East Water Street | Schenectady, N. Y..... | 1 River Road |
| El Paso, Tex..... | 109 North Oregon Street | Seattle, Wash..... | 811 First Avenue |
| Erie, Pa..... | 10 East Twelfth Street | Spokane, Wash..... | 423 Riverside Avenue |
| Fort Wayne, Ind..... | 1635 Broadway | Springfield, Mass..... | 1387 Main Street |
| Grand Rapids, Mich..... | 201 Monroe Avenue | Syracuse, N. Y..... | 113 South Salina Street |
| Hartford, Conn..... | 18 Asylum Street | Tacoma, Wash..... | 950 Pacific Avenue |
| Houston, Tex..... | 1016 Walker Avenue | Tampa, Fla..... | 112 Cass Street |
| Indianapolis, Ind..... | 106 North Illinois Street | Terre Haute, Ind..... | 701 Wabash Avenue |
| Jackson, Mich..... | 308 Francis Street | Toledo, Ohio..... | 520 Madison Avenue |
| Jacksonville, Fla..... | 108 West Forsyth Street | Tulsa, Okla..... | 409 South Boston Street |
| Kansas City, Mo..... | 1004 Baltimore Avenue | Utica, N. Y..... | 239 Genesee Street |
| Knoxville, Tenn..... | 602 South Gay Street | Washington, D. C..... | 1405 G Street N. W. |
| Little Rock, Ark..... | 223 West Second Street | Waterbury, Conn..... | 195 Grand Street |
| Los Angeles, Cal..... | 5201 Santa Fe Avenue | Worcester, Mass..... | 340 Main Street |
| | | Youngstown, Ohio..... | 16 Central Square |

Canada: Canadian General Electric Company, Ltd., Toronto

Hawaii: W. A. Ramsay, Ltd., Honolulu.

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| | | | |
|------------------|----------------------------|-------------------|------------------------|
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| Chicago..... | 509 East Illinois Street | Minneapolis..... | 410 Third Ave., North |
| Cincinnati..... | 215 West Third Street | New York..... | 627 Greenwich Street |
| Cleveland..... | 1133 East 152nd Street | Philadelphia..... | 1223 Washington Avenue |
| Dallas..... | 1801 North Lamar Street | St. Louis..... | 1009 Spruce Street |
| Detroit..... | 700 Antoinette Street | Seattle..... | 1509 Fourth Ave. S. |
| Kansas City..... | 819 East Nineteenth Street | | |

Special service divisions are also maintained at the following works of the Company: Bloomfield, N. J.; Erie, Pa.; Ft. Wayne, Ind.; Oakland, Calif.; Pittsfield, Mass.; Schenectady, N. Y. and West Lynn, Mass.—River Works and West Lynn Works.

BROADCASTING STATIONS

WGY, Schenectady, N. Y. KOA, Denver, Colo. KGO, Oakland, Calif.

Distributors for the General Electric Company outside of the United States and Canada

INTERNATIONAL GENERAL ELECTRIC COMPANY, INC.

New York City, 120 Broadway

General Sales Offices, Schenectady, N. Y.

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ARGENTINA: General Electric, S. A., Buenos Aires
AUSTRALIA: Australian General Electric Company, Ltd., Sydney, Melbourne, Adelaide, Brisbane and Newcastle
BELGIUM AND COLONIES: Societe d'Electricite et de Mecanique (Procedes Thomson-Houston & Carels)
Societe Anonyme, Brussels, Belgium
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CHILE: International Machinery Company, Santiago, Antofagasta and Valparaiso; Nitrate Agencies, Ltd., Iquique
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PORTUGAL AND COLONIES: Sociedad Iberica de Construccoes Electricas Lda., Lisbon
RUSSIA: (See China)
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SOUTH AFRICA: South African General Electric Company, Ltd., Johannesburg and Capetown
SPAIN AND COLONIES: Sociedad Iberica de Construcciones Electricas, Madrid, Barcelona and Sevilla
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