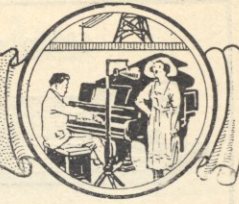


# RADIO BROADCAST



**W**ITH this issue, we are presenting a broadcast map which is a little different than the usual types of broadcasting maps, due to the fact that we would like every reader to keep this one, mounting it upon a piece of cardboard and hanging it up over his radio set. Furthermore, it can be kept up to date indefinitely.

Bordering the map itself are listed the names of towns, states, broadcasting stations, and their respective call letters. Only phone stations, or those which transmit radio telephonic messages or music are to be found. Following each of the names is a code marking such as D-15. In order to find the location of D-15 we look in the horizontal column for the letter "D" and follow this space until it is crossed by the vertical column enumerated 15 on the map. This gives us the location of the town.

Thus, as the new calls come in, and as the list of the stations increases, new towns may be recorded which do not appear on the map. Every month we will publish the names of new

stations and their location with regard to the particular square they are in. In this manner, the radio enthusiasts will find it a comparatively simple matter to enlarge the list and keep his map strictly up-to-date.

A brief summary of the station and the nature of these broadcasts as well as the time the station is broadcasting will be given.

In this work, we would appreciate the assistance of our numerous readers in plotting the new phone stations. Please bear in mind that we desire phone stations only, either amateur or commercially licensed broadcasting stations. So it is up to our readers to get busy now, and make this list complete. We cannot do so without their cooperation. If all the amateurs will secure the names of the transmitting stations, as well as their respective calls, and send them to Broadcast, care of Science and Invention, this map should be completed in a very few issues.

The wave lengths as well as the maximum distances stations have been heard are absolutely

authentic in this list and have been extracted from letters sent to the broadcasting stations from the various amateurs "listening in." Of course, exceptional ranges although tried for, are not within the usual experimenter's pocketbook, and such results as those obtained in Scotland, where American amateurs were heard, are possible only with large groups of vacuum tube amplifiers or during favorable atmospheric conditions.

The Government can only furnish those stations commercially licensed for broadcasting work, but there are many other radio phone stations not so licensed which send an occasional record through the ether, or otherwise pleasantly disturb the air. Have them all listed on your map. After the map has been mounted and placed near your receiving set, listen carefully. Then as you hear the various stations, stick a pin into each location so that you will have a permanent record for yourself. You can then quickly point out to friends the location of the broadcasting stations "heard."

Address all communications to "Broadcast," care of SCIENCE AND INVENTION.

**Akron, Ohio. Radioart Store Station. 8 UX. 190-200 meters.** Temporarily discontinued on account of recent ruling forbidding broadcasts on 200 meters.

**Anacostia, D. C. NOF and NSF. 350 meters.** Former call letters for broadcasts; latter for government work.

**Austin, Texas. State University. 5 XU. 360 meters.** Not yet broadcasting. Call will probably change.

**Berlin, N. H. Y. M. C. A. 1 BKP. 200 meters.** Range about 50 miles; local broadcasts. Impromptu program.

**Charlotte, N. C. Southern Radio Corp. WBT. 360 meters.** Located at 905 Realty Bldg.; 250 watt tube station, consistent range 200 miles daylight, 500 miles night. Broadcasts music, news of general interest daily, and church services on Sunday.

**Chicago, Ill. Westinghouse Station. KYW. 360 meters.** 2,000-mile radius. 9.30 A. M. to 9.15 P. M. every day except Sunday. Sunday (Chapel Service), 3.00-4.30 P. M. General broadcasts, 9.30 A. M. to 1.15 P. M. Market reports, 2.15, 4.15, and 6.30 P. M. News reports after market reports. Special speakers, 7.00 P. M. Children's bed-time story, 7.30 P. M. Music, 8.00 to 9.00 P. M. News, 9.00 to 9.15 P. M.

**Cincinnati, O. Precision Equipment Co. WMH. 360 meters for concerts; 485 for news.** 11.00 A. M. to 4.00 P. M., news and weather reports on week days. 8.15 P. M., concerts on Monday, Wednesday and Saturday. One of the first stations to adopt regular schedule. 1,000 miles maximum distance heard.

**Cleveland, O. Cox Mfg. Co. 8 ACS. 200 meters.** Station shut down because of government order prohibiting 200 meter broadcast.

**Cleveland, O. W. R. Cox. WHK. 360 meters.** 300 miles radius. 1.30 P. M. to 2.00 P. M., 3.30 P. M. to 4.00 P. M. and 8.00 P. M. to 9.30 P. M. every day.

**Columbus, O. Ohio State University. 8 YO. 275 meters.** Time signals, market reports and other useful information. 700 miles.

**Dallas, Texas. Police Dept. WRR. 450 meters.** 7.00 P. M., news; 8.30 P. M., music on week days, 11.00 A. M. and 7.45 P. M. Church services on Sunday. Range, 1,500 miles.

**Davenport, Iowa. Palmer School of Chiropractic. WOC. 360 meters.** Concert daily except Sunday, 5.45 to 6.00 P. M. and 7.00 to 8.00 P. M. Sunday, 8.00 to 8.15, business review. Chimes Sunday, 9.00 to 10.00 A. M. and 5.30 to 6.00 P. M. 1 K.W. two tube set. Station formerly located at Rock Island. 600 miles.

**Dayton, O. McCook Army Station. WFO.** No information as to range or broadcast yet.

**Deal Beach, N. J. American Tel. & Tel. Co. 2 XJ.** Varying wave lengths, working with KDOW, test station.

**Denver, Colo. Fitzsimmons Gen. Hospital Station. DD 5.** 325 meters. Concert, news daily, 8.15 P. M. Range 1,500 miles.

**Denver, Colo. Reynolds Radio Co. 9 ZAF. 360 meters.** Daily weather, 8.30 A. M. Weather and news, 7.45 P. M. Concert, 8.00 to 9.30 P. M. Range 1,500 miles.

**Denver, Colo. W. D. Pyle. 9 WD. 200 meters.** Saturday, 8.00 to 9.50 P. M., concert. Range 1,500 miles.

**Denver, Colo. Y. M. C. A. Station. 9 YAL. 485 meters.** 9.55 P. M., time signals and news. Heard 1,500 miles.

**Detroit, Mich. Detroit News. WWJ. 360 meters.** 4 250-watt tubes, 2 as oscillators; 2 as modulators; and 1 50-watt tube as speech amplifier. 11.30 to 11.55 A. M. phonograph music. 3.30 P. M., market and weather report on 475 meters. 7.00 to 8.15 P. M. evening program. Music, vocal and instrumental, humor, lectures, jokes and vaudeville artists. 1,500 miles.

**Fairfield, Ohio. U. S. Army Station. WL 2.** Experimental station.

**Fort Worth, Texas. Fort Worth Record. WPA. 360 and 475 meters.** News, instructions and hints on radio, special question and answer department, concerts and market reports, weather forecast, police and fire reports, 7.10 P. M. Maximum range 100 miles. New set with consistent range of 1,000 miles now in course of erection.

**Hamilton, O. Doron Bros. Electrical Co. WRK. 360 meters.** Heard 800 miles on crystal; maximum 1,400 miles, 8.30 to 10.30 P. M.; music Monday; 10.30, health lecture. Wednesday 8.30, music, lectures and vaudeville. Saturdays 8.30, music, health and radio lectures. Alternate Sundays, church services.

**Jersey City, N. J. Hudson City Radio Club. 2 CBK. 200 meters.** 2.00 to 3.00 P. M. Sunday, music; 5.00 to 6.00 P. M. week days, music. Uses Hudson City Radio Shop's Station.

**Jersey City, N. J. Hudson City Radio Shop. 2 BPG. 200 meters.** Saturday, 10.00 to 11.00 P. M., music. This station is used to broadcast Hudson City Radio Club material on call 2 CBK.

**Jersey City, N. J. Jersey Review. 2 IA. 200 meters.** Third station in the U. S. to broadcast concert, 7.00 to 8.00 P. M. week evenings. One-half hour chapel service Sunday evenings. Heard in Memphis, Tenn.; Owensboro, Ky.; S. S. Corona, 950 miles at sea; Toronto, Canada, and Calais, Me.

**Jersey City, N. J. N. J. Wireless Telephone Co. WNO. 360 meters.** Hourly on the half hour from 12.30 to 5.30 P. M., news of the day and music. 6.30 P. M. Monday, half hour program for children; 6.30 P. M. Tuesday, first act of local popular play; 6.30 P. M. Wednesday, Thursday, Friday, Saturday, music.

**Lincoln, Neb. University of Nebraska. 9 YY. 375 meters.** Heard at Hazelton, Pa. 10.10, market reports and weather forecast. 1,200 miles maximum distance heard.

**Los Altos, Calif. Colin B. Kennedy Co. KLP. 360 meters.** 7.30 to 8.30 P. M., news supplied by the Journal of Electricity and Western Industry, followed by music on Monday. 8.30 to 9.00 P. M., music on Thursday; 4.00 to 5.00 P. M., music on Sunday. Heard in Washington, Oregon, California, Nevada, Idaho, Utah, Arizona, Montana, Wyoming, Colorado, New Mexico, South Dakota, Nebraska, Kansas, Texas, Minnesota, Iowa, Ohio, Canada, Alaska and Hawaii.

**Los Altos, Calif. Colin B. Kennedy Co. 6 XAC. 200 meters.** Experimental station.

**Los Angeles, Calif. C. R. Kierliff & Co. KHJ. 360 meters.** Broadcasting for Los Angeles Times. Schedule not yet arranged.

**Los Angeles, Calif. Leo J. Meyberg Co. KYJ. 360 meters.** Operating for Hamberger Department Store. Heard 1,000 miles in North and Three Rivers, Canada by airplane. San Francisco receives easily, also Idaho, Wyoming and Washington. Music 4.00 P. M. to 5.00 P. M. Weather reports Tuesday, Thursday and Saturday, 8.00 P. M. to 9.00 P. M. Educational matters, 9.30 A. M. to 10.30 A. M. In connection with this station there is a free radio school—300 to 400 pupils. Night school for adults.

**Los Angeles, Calif. Western Radio Elec. Co. KOG.** Heard in Quartzburg, Idaho and Bozeman, Montana. Press notices every afternoon except Sunday, 5.00 P. M. to 5.45 P. M. Music Tuesday and Wednesday evenings, 8.00 P. M. to 9.00 P. M. Music Friday evenings, 8.15 P. M. to 9.00 P. M.

**Madison, Wisconsin. University of Wisconsin. WHA. 360 and 485 meters.** Range 1,000 miles. Daily press and market reports by telephone and telegraph, weather and time signals, Music, lectures, Tuesday evenings, 8.00 P. M. to 9.30 P. M. Press bulletin, music and announcement of weekly program Friday evenings, and concerts.

**Mamaroneck, New York. Experimental Station. 2 BQH. 200 and 1,200 meters.** Works on test work exclusively from 10.30 P. M. and after, Tuesday, Thursday and Saturday nights. This station is experimental, working continually for the benefit of the amateur, and is in charge of a competent radio engineer. Heard 1,400 miles away.

**Medford Hillside, Mass. American Radio Research Co. WGI.** Daily 8.00 P. M. Music and regular broadcasts. Radius 1,000 miles. Police reports in slow code, then phone. Station formerly called 1-XE.

**Newark, N. J. L. Bamberger & Co. WOR. 350 meters.** Music from 9.30 to 6.30 hourly on half hour. No Sunday program. Lectures and talks included. Heard at Boston.

**Newark, N. J. Westinghouse Test Station. 2 SAI.** No schedule.

**Newark, N. J. Westinghouse Elec. Mfg. Co. WJZ. 360 meters.** Program daily from 11.00 to 6.00 hourly on the hour. Regular program from 7.00 to 10.30. Music, shows, lectures, operas, artists, etc. Time and weather reports. Church services and sacred music on Sundays. 1,800 miles.

**New York City, N. Y. Hudson Radio Club. 200 meters and over. 2 AYZ, 240 W. 80th St.; 2 BHY, 171 E. 70th St.; 2 KP, 345 W. 88th St.; 2 ADK, 650 West End Ave.** Music and club publicity.

**New York City, N. Y. Shipowners' Radio Service. WDT. 360 meters.** No regular schedule at present time.

**New York City, N. Y. John Wanamaker. WWZ. 360 meters.** Broadcasts hourly on the 40 minutes from 11.40 to 5.40 inclusive. At 10.30 broadcasts till midnight. Program music, talks on unusually interesting matters. Heard 1,400 miles.



N. Y. Harbor, N. Y., Fort Wood, Governor's Island. WVP. 1,450 meters. Irregular program. Music. Lectures and radio questions answered via radio telephone. Heard 1,200 miles.

Oakland, Calif. Hotel Oakland. Western Radio Inst. Preston D. Allen. KZM. 360 meters. 1,900-mile radius. News on week days, 7.15 P. M. Music on Tuesdays, 7.30 to 8.15 P. M. Music on Fridays, 8.15 to 9.00 P. M. Sent out first radio sermon in the west to an audience of 30,000.

Parkersburg, Pa. H. A. Beale. 3XW. 3Z0. 200 meters. Heard in all the New England states. Range about 1,000 miles.

Pasadena, Calif. J. J. Dunn & Co. KLB. 360 meters. Heard 600 miles. Music Monday and Friday, 7.30 to 8.15 P. M. Music Sunday, 3.00 to 4.00 P. M. and 8.00 to 9.00 P. M. Power to be increased ten times in six weeks from present entry. Professional talent at least once a week.

Pawtucket, R. I. DeLancey, Felch & Co. Station of Raymond W. Farnum. 1 OJ. 200 meters. No regular program now. Music. Range 150 miles.

Pawtucket, R. I. Standard Radio & Elec. Co. 1 XAD. 290 meters. Thos. P. Giblin Station. 2 50-watt tubes, radius 400 miles. Heard at distances of 1,000 miles. Located at 463 Broadway, same city. Broadcasts three days per week, music, lectures and letters read. Now working on 290 meters. Aerial 70 feet long, 9 wires on spreader 15 feet, 11 wires on counterpoise. Ground, 11 wires 70 feet long, copper plates at end.

Philadelphia, Pa. Gimbel Bros. WIP. 360 meters. Heard 1,000 miles. Music, speeches, news items. Programs published in Philadelphia papers.

Philadelphia, Pa. T. F. Howlette. WGL. 330 meters. No schedule.

Philadelphia, Pa. Strawbridge & Clothier. WFL. 360 meters.

Philadelphia, Pa. John Wanamaker. WOO. 360 meters. Broadcasting principally a musical program, 7.00 to 10.00 P. M. Temporary installation.

Pittsburgh, Pa. Westinghouse Elec. Co. KDKA. 360 meters. 10.00 to 10.15 A. M., music; 12.30 to 1.00 P. M., music; 2.00 to 2.20 P. M., music; 4.00 to 4.20 P. M., music; 7.30 to 7.45 P. M., bed time story; 7.45 P. M., news; 8.30 to 9.00 P. M., music; 9.00 to 9.05 P. M., United Press Service News; 9.05 to 9.30 P. M., music; 9.55 to 10.00 P. M., time signals. Sundays, chapel services, 11.00 A. M., 3.00 and 7.30 P. M. Range 2,000 miles.

Portland, Ore. Willard P. Hawley. 7 XG. 200 meters. Experimental and vocal music between 8.00 and 8.45 P. M. Tuesday and Wednesday, and between 9.00 and 9.30 P. M. Thursday.

Portland, Ore. Northwestern Radio Mfg. Co. 7 XF. Broadcasts every Tuesday and Friday evening at 8.45 P. M. Public Health Service Bulletins. Sends out Industrial News every Monday evening.

Portland, Ore. The Oregonian. KSW. 360 meters. Music, talks, news bulletins daily. Maximum distance 900 miles.

Richmond, Ind. Richmond Palladium Newspaper Co. WOZ. 360 meters. Stock and market reports daily at 4.00 and 6.30 P. M. Range about 100 miles.

Ridgewood, N. Y. Broadcasting Corp. of America for Times Publishing Co. WHN. 360 meters. 100 miles radius. Every hour on the hour from 8.00 to 11.00 A. M. Every hour on the half hour, 11.00 A. M. to 9.30 P. M.

Roselle Park, N. J. Radio Corp. of America. WDJ. 360 meters. Program combined with WJZ, the Westinghouse station at Newark, N. J. The Radio Corporation will open a new station in New York about June 1st.

Sacramento, Calif. J. C. Hobrecht. KVQ. 360 meters. Operating in connection with Sacramento Bee newspaper. Equipment, 5 5-watt tubes, 2 oscillators, 2 modulators, 1 speech amplifier. Heard in Alberta, Canada, Washington, Wyoming, Utah and Idaho. Every afternoon from 5.30 to 6.30, press notices and music. Wednesday and Saturday, 8.00 to 9.00 P. M., music. Range about 1,000 miles.

San Jose, Calif. Chas. D. Herrold. KQW. 360 meters. Equipment, 50 watt phone with facilities for connecting with the telephone line. 1,500-mile radius. Music and church services are transmitted by telephone to the laboratories, and then re-transmitted via radio.

Schenectady, N. Y. General Electric Co. WGY. 360 meters. Heard in Iowa, Minneapolis and Cuba. 1,600 miles. Broadcasts music, speech and topics of general interest.

Schenectady, N. Y. Union College Radio Club. WRL. 360 meters. Weekly program, Sunday 7.30 P. M. Irregular program during week. Power, 1KW.

Seattle, Wash. Excelsior Motorcycle Co. KHQ. Works on divided schedule with Northwest Radio Service. Broadcast 7.00 to 9.00 P. M. Music.

Seattle, Wash. Northern Radio Elec. Co. WJO. 360 meters. Operating in conjunction with Seattle Post Intelligencer. 100 watt vacuum tube transmitter. Heard by ship 3,600 miles at sea. News, market reports, music, etc. Seven to nine hours daily. Land range about 1,200 miles.

Seattle, Wash. Post Intelligencer. KFC. 360 meters. Operated by the Northern Radio Co. News bulletins between 12.00 and 1.00 P. M. on special occasions; at 3.30 and 5.30 P. M., news bulletins, market quotations and music. 8.30 to 10.30 P. M., cables, news, new phonograph records, concerts.

Springfield, Mass. Westinghouse Station. WBZ. 360 meters. Children's bed time story, 7.30 P. M. (every day except Sunday); prominent speaker, 7.45 P. M. (every day except Sunday); musical program, 8.00 to 9.00 P. M. (every day except Sunday); chapel service, 3.00 P. M. Sunday; church service, 8.00 P. M. Sunday. Maximum distance 1,400 miles.

Stockton, Calif. C. O. Gould. KJQ. 360 meters. 75 to 100 mile radius, operated by D. W. Horstmeyer. 5.00 to 5.30 P. M., news and music on week days. 7.00 to 8.00 P. M., music on Wednesdays and Sundays. 10.00 to 11.00 A. M., church services on Sundays.

Washington, D. C. Doubleday Hill Elec. Co. KQV. Every afternoon from 4.30 to 5.30 P. M. Thursday and Friday from 7.30 to 8.30 P. M.

Washington, D. C. White & Boyer Co. Concerts with short lectures on radio, Keith's vaudeville, music, etc. Range 1,000 miles.

There are other stations which are not yet listed on this schedule because the information regarding them has been received from various sources, and the call letters or nature of the broadcasts are not yet definitely determined. In other words, the stations here listed may not be in operation or their call letters may have been changed. Nevertheless, phone messages from each have been heard. Where possible, the name of the concern is given and, in those places where two different calls are found, some writers have reported hearing one and some the other. Telegrams have been dispatched to nearly every station here listed, but many had not replied up to the time we went to press. The list follows:

- Atlanta, Ga. Garter Electric Co. 4-CD.  
Chicago, Ill. WBU.  
Cleveland, Ohio. Cleveland Radio Association.  
Cleveland, Ohio. WHK.  
Columbus, Ohio. Electrical Specialty Co. BYU. 200 meters.  
Detroit, Mich. Police Department. KOP.  
Gridley, Calif. KFU.  
Hollywood, Calif. Elec. Lighting Co. KGC.  
Indianapolis, Ind. WOH.  
Indianapolis, Ind. Hamilton Mfg. Co. WLK.  
Jefferson City, Mo. WOS.  
Kansas City, Mo. WOQ.  
Lansing, Mich. WHW.  
Los Gatos, Calif. Heard by ships 2,500 miles at sea. 360 meters.  
Mexico City, Mex. XDA.  
Montreal, Can. Marconi Telegraph Co.  
New Haven, Conn. A. C. Gilbert Co. WGJ or WCS.  
New York, N. Y. Deforest Radio Co. WJX. 360 meters.  
Ossining, N. Y. Deforest R. T. & T. Co. 3-Z0.  
Philadelphia, Pa. WCL.  
Pinebluff, Ark. WOK.  
Pittsburgh, Pa. Newspaper Ptg. Co. WPB.  
Pomona, Calif. KGF.  
Rochester, N. Y. WHQ.  
Rome, Ga. 4-BQ.  
San Francisco, Calif. Fairmont Hotel. 360 meters.  
San Francisco, Calif. KUO.  
Stockton, Calif. Portable Wireless Tel. Co. KWG.  
Sunnyvale, Calif. Radio Shop. KJJ.  
Toledo, Ohio. Marshall Gerkin Co. WDZ, WHU.  
Washington, D. C. Church of the Covenant. WDH.  
Washington, D. C. Radio Construction Co. WDW.

## Radio Reception on Aircraft

By G. H. DALY, D. S. M.

LISTENING to the terrific roar of an airplane's engine one might well be justified in supposing that the reception of wireless signals under such conditions is an utter impossibility. Yet the fact, that the aero wireless operator receives signals as efficiently as his contemporary on land or sea, is well known.

It is possible for the operator to pick out the signals thru the noise, just as an expert musician can pick out the sound of one particular instrument in a large orchestra including many other instruments.

Altho the amplifying relay has overcome the difficulty of receiving without interference by the external noise of the aircraft engine, there is another and more troublesome disturbance, which the engine creates to the detriment of the wireless receiver, namely magneto induction noises arising from the numerous high tension circuits of the modern aircraft engine.

The magneto induction noises set up by these small wireless stations are known

as eddy or parasitic currents and their chief aim in life is to let themselves be heard much and often in the receiving telephones. Frequently when an aero operator is straining his utmost over a particularly weak signal of national importance he will be interrupted by a sound resembling static gone mad. The aero-engine maker has had to take special precautions to eliminate them when constructing the engine.

A striking demonstration of this is shown in the case of the latest and most powerful aero engine yet invented, namely the thousand horse-power Napier Cub.

This engine has sixteen cylinders with two sparking plugs in each cylinder which are fed by high tension current from four magnetos. The number of revolutions which the engine can do is in the vicinity of two thousand per minute—and as there are about eight sparks per revolution, or in other words, eight parasitic wireless stations transmitting per revolution, there

are roughly sixteen thousand transmissions during a minute of time.

But, as mentioned above, a way has been found by which the trouble is cured and the parasitic currents will have to toe the line. This is done by sheathing all the high tension cable in a special braided covering of an electrically conductive material and carrying the cables in aluminum brackets four inches apart secured to the top of the crank case. Thus the currents are collected in groups and earthed into the body of the engine.

But these parasites, with the pertinacity of youth on being ousted from one position, carry on in another part of the electrical circuit of the engine called the distributor.

These distributors are earthed by means of brass shields each with a length of copper wire attached to an earthing terminal on the crank case so that all the obnoxious currents exhaust themselves in the large metallic body of the engine.