

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY RADIO DIVISION

Washington, January 31, 1928—No. 130

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ABBREVIATIONS

The necessary corrections to the list of Commercial and Government Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name. = Name of station.
 Loc. = Geographical location. O=west longitude. N=north latitude. S=south latitude.
 Call System = Call signal (letters) assigned.
 Range = Radio system used and sparks per second.
 W. l. = Normal range in nautical miles.
 Service = Wave lengths assigned: Normal wave lengths in italics.
 = Nature of service maintained:
 FX=Point-to-point (fixed service).
 PG=General public.
 PR=Limited public.
 RC=Radio compass.
 AB=Aviation beacon.
 B=Beacon.
 P=Private.
 O=Government business exclusively.
- Hours = Hours of operation:
 N=Continuous service
 X=No regular hours.
- F. T. Co. = Federal Telegraph Co.
 I. R. T. Co. = Intercity Radio Telegraph Co.
 I. W. T. C. = Independent Wireless Telegraph Co.
 K. & C. = Kilbourne & Clark Manufacturing Co.
 M. R. T. Co. = Mackay Radio and Telegraph Co.
 R. C. A. = Radio Corporation of America.

- R. M. C. A. = Radiomarine Corporation of America.
 T. R. T. Co. = Tropical Radio Telegraph Co.
 U. R. Corp. = Universal Radio Corp.
 W. S. A. Co. = Wireless Specialty Apparatus Co.
 C. w. = Continuous wave.
 I. c. w. = Interrupted continuous wave.
 Kc. = Kilocycles.
 Fy. = Frequency.
 A. c. = Alternating current.
 V. t. = Vacuum tube.
 U. S. L. = Applies only to the list of Commercial and Government Radio Stations of the United States.

NEW STATIONS

Commercial land stations, alphabetically, by names of stations

[Additions to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1927, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Station	Call signal	Wave lengths	Service	Hours	Station controlled by—
Catanauan, P. I. (Tayabas) ¹ .	KZKN	550-1,100, 750.	PG	-----	Philippine insular government.

¹ Loc. 122° 19' 30" E., 13° 39' 30" N.; range, 120; system, U. S. Army v. t. telegraph; hours, 8 a. m., 12 noon, 2-5.30 p. m. daily; 9-11 a. m., Sundays and holidays, ship service last 10 minutes of each hour; rates, ship service, 6 cents per word.

Commercial ship stations, alphabetically, by names of vessels

[Additions to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1927, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Name of vessel	Call signal	Rates	Service	Hours	Owner of vessel	Station controlled by—
Breeze.....	WQBQ	8	PG	X	Bay State Fishing Co.....	R. M. C. A.
Galveston.....	KDQE	8	PG	X	U. S. S. B.	
Grifco.....	KDFN	8	PG	X	Inter Island Steam Navigation Co.	
Oldham.....	KDQG	8	PG	X	U. S. S. B.	
Potter.....	KDFC	8	PG	X	do.....	
Trinidad.....	WQBP				Panama Canal.....	Owner of vessel.

Commercial land and ship stations, alphabetically, by call signals

[b, ship station; c, land station]

Call signal	Name of station	Call signal	Name of station
KDFC	Potter.....b	KZKN	Catanauan, P. I. (Tayabas).....c
KDFN	Grifco.....b	WQBP	Trinidad.....b
KDQE	Galveston.....b	WQBQ	Breeze.....b
KDQG	Oldham.....b		

Commercial aircraft stations, alphabetically, by names of stations

[Additions to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1927, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Station	Call signal	Wave length	Service	Hours	Station controlled by—
Registration No. NX3903	KDZ	33.1	P	X	George H. Wilkins, care Lockheed Aircraft Co., 1006 North Sycamore Avenue, Los Angeles, Calif.
Zenith Albatross (registration No. X3622). ¹	KHAD	33.1	P	X	Zenith Aircraft Corporation, Santa Ana, Calif.

¹ Power, 50 watts; system, composite v. t. telegraph.

² Power, 15 watts; system, composite v. t. telegraph.

Commercial aircraft stations, alphabetically, by call signals

Call signal	Name of station	Call signal	Name of station
KDZ	NX3903.	KHAD	Zenith Albatross (registration No. X3622).

Broadcasting stations, alphabetically, by names of States and cities

[Additions to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1927]

State and city	Call signal	Wave length	Frequency (kilocycles)	Power (watts)
Mississippi: Gulfport.....	WQBO	222.1	1,350	15

Broadcasting stations, alphabetically, by call signals

Call signal	Location of station (address)	Owner of station	Power (watts)	Wave length	Frequency (kilocycles)
WQBO	Gulfport, Miss., 1319 Twenty-sixth Avenue.	Gulf Coast Music Co.	15	222.1	1,350

Government land stations, alphabetically, by names of stations

[Additions to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1927, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Station	Call signal	Wave length	Service	Hours	Station controlled by—
Dry Tortugas Light Station, Fla. ¹	WVER	600, 706, 1000	B	-----	Bureau of Lighthouses.
Mobile, Ala.....	NCK	-----	O	-----	U. S. Coast Guard.

¹ Loc. 82° 55' 13" W., 24° 37' 59" N.; system, Bureau of Lighthouses v. t. telegraph.

Government ship stations, alphabetically, by names of stations

[Additions to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1927, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Station	Call signal	Wave length	Service	Hours	Station controlled by—
Mendota.....	NATM	O	X	U. S. Navy.
Osprey.....	NIZF	O	X	U. S. Coast Guard.
San Pablo.....	WYBC	706	O	X	U. S. Army.

Government land and ship stations, alphabetically, by call signals

[b, ship station; c, land station]

Call signal	Name of station	Call signal	Name of station
NCK	Mobile, Ala.....c	WYBC	San Pablo.....b
NATM	Mendota.....b	WWER	Dry Tortugas Light Station, Fla.....c
NIZF	Osprey.....b		

ALTERATIONS AND CORRECTIONS

COMMERCIAL LAND STATIONS

[Alterations and corrections to be made to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1927, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

EAST MORICHES, N. Y. (WSA).—Strike out all particulars.

ENSENADA, P. R.—Hours, N.

NEW LONDON, CONN.—Call signal changed to WSA.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY, BY NAMES OF VESSELS

[Alterations and corrections to be made to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1927, and to the International List of Radiotelegraph Stations, published by the Berne Bureau]

ASHBEE.—Name changed to Silverspruce.

ATHERO II.—Name changed to Caroline; owner of vessel, Eldridge R. Johnson.

CRESSIDA.—Station controlled by R. M. C. A.

EDITOR.—Correct call signal KOBG.

EL ABETO.—Owner of vessel, Coastwise S. S. & Barge Co.

EL CEDRO.—Owner of vessel, James Griffiths & Sons.

FOREST KING.—Owner of vessel, Traders Transport Co.

GUANTANAMO.—Name changed to Comeris; owner of vessel, New York & Porto Rico S. S. Co.

HAVANA.—Range, 150-300; system, Navy-W. S. A. Co. spark, 1,000 and I. W. T. Co. arc; service, PG; hours, N.; rates, 8 cents per word; station controlled by R. M. C. A.; owner of vessel, Atlantic, Gulf & West Indies S. S. Lines. Bulletin No. 128, November 30, 1927, incorrectly gave the orthography of the name as "Habana."

HUGUENOT.—Owner of vessel, Huguenot S. S. Corp.

MALIBU.—Owner of vessel, Mary K. Rindge; station controlled by R. M. C. A.

SAGAPORACK.—Owner of vessel, American Scantic Line.

SANTA CECILIA (WBB).—Owner of vessel, Nautilus S. S. Corp.

SAVARONA (KFZT).—Owner of vessel, Mrs. Richard M. Cadwalader, jr.

SAVARONA (WBBY).—Station controlled by R. M. C. A.

SEEKONK.—Owner of vessel, Seekonk Corporation.

SEVERANCE.—Owner of vessel, Diamond S. S. Transportation Corporation.

SILVERBROOK.—Correct orthography of name is "Silveroak"; owner of vessel, Clegg Ship Owning Corporation.

STEELENDOR.—W. 1., 715, 875; rates, Great Lakes service, 4 cents per word.

WEST ERRAL.—Name changed to Diamond Head.

WEST GOTOMSKA.—Station controlled by R. M. C. A. (U. S. L.).

WILLA CROSBY.—Name changed to Admiral Moser.

Strike out all particulars of the following-named vessels: Chillicothe, Shenango.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY, BY CALL SIGNALS

KERJ, read Diamond Head; KFZO, read Caroline; KIGZ, read Silverspruce; KOJG, read Silveroak; KWN, read Comeris; WDF, read Admiral Moser; WSA, read New London, Conn.; strike out all particulars following the call signals, KFAQ, KTC, WST.

BROADCASTING STATIONS, BY CALL SIGNALS

[Alterations and corrections to be made to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1927]

KFNF (Shenandoah, Iowa).—Power, 2,000 from 6 a. m. to 7 p. m.
 KFUR (Farmington, Utah, near).—Changed to Ogden, Utah; power, 50.
 KFWC (San Bernardino, Calif.).—Changed to Ontario, Calif., Valley Boulevard.
 KFXJ (Denver, Colo.).—Power, 50.
 KGBU (Ketchikan, Alaska).—W. l., 399.8, fy. kc., 750.
 KGDX (Shreveport, La.).—Call signal changed to KWEA.
 KGEH (Eugene, Oreg.).—Call signal changed to KIOS.
 KGFP (Mitchell, S. Dak.).—Strike out all particulars.
 KHJ (Los Angeles, Calif.).—W. l., 399.8, fy. kc., 750.
 KLDS (Independence, Mo.).—Owner of station, Midland Broadcasting Co. and Reorganized Church of Jesus Christ of Latter Day Saints.
 KMBS (Independence, Mo.).—Owner of station, Midland Broadcasting Co. and Reorganized Church of Jesus Christ of Latter Day Saints.
 KNX (Los Angeles, Calif.).—Owner of station, Western Broadcast Co.
 WAAF (Chicago, Ill.).—The word "portable" shown in Bulletin No. 128, November 30, 1927, in connection with a change in this station should have appeared on the following line in back of Bethayres, Pa. (WALK), which is now permanently located at Willow Grove, Pa.
 WFBM (Indianapolis, Ind.).—Changed to Perry Township, Ind.; power, 1,000.
 WFBR (Baltimore, Md.).—Power, 250 night, 500 day.
 WHBN (Gainesville, Fla.).—Call signal changed to WRUF; power, 5,000; w. l., 202.6, fy. kc., 1,480 (construction permit for change in power and w. l. issued November 21, 1927).
 WHPP (New York, N. Y.).—Changed to Englewood Cliffs, N. J.
 WIBW (Chicago, Ill., portable).—Changed to Topeka, Kans., Tenth and Kansas Streets; power, 250.
 WLWL Kearney, N. J.—Power, 5,000.
 WMBI (Chicago, Ill.).—Power, 2,500.
 WNAX (Yankton, S. Dak.).—W. l., 302.8, fy. kc., 990.
 WNBL (Bloomington, Ill.).—Strike out all particulars.
 WPUB (New York, N. Y.).—Call signal changed to WMSG.
 WRCV (Norfolk, Va.).—Call signal changed to WIVA.
 WSOE (Milwaukee, Wis.).—Call signal changed to WISN.
 WTAL (Toledo, Ohio).—Call signal changed to WSPD.

GOVERNMENT LAND STATIONS, ALPHABETICALLY, BY NAMES OF STATIONS

[Alterations and corrections to be made to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1927, and to the International List of Radio telegraph Stations, published by the Berne Bureau]

BRYAN, OHIO.—Call signal changed to KRL.
 CHEYENNE, WYO.—Call signal changed to KSG.
 ELKO, NEV.—Call signal changed to KOJ.
 IOWA CITY, IOWA.—Call signal changed to KIS.
 MAYWOOD, ILL.—Call signal changed to KDA.
 NORTH PLATTE, NEBR.—Call signal changed to KVM.
 OMAHA, NEBR.—Call signal changed to KJF.
 RENO, NEV.—Call signal changed to KKK.
 ROCK SPRINGS, WYO.—Call signal changed to KDN.
 SACRAMENTO, CALIF.—Call signal changed to KOC.
 SAN FRANCISCO, CALIF. (KFZP).—Call signal changed to KEP.
 Strike out all particulars of the following-named stations: Fort Casey, Wash., and Fort Whitman, Wash.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY, BY NAMES OF STATIONS

[Alterations and corrections to be made to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1927, and to the International List of Radiotelegraph Stations, published by the Berne Bureau]

McCALL.—Owner of vessel, U. S. Coast Guard.

SHAWMUT (NML).—Name changed to Oglala.

WENONAH.—Strike out all particulars.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY, BY CALL SIGNALS

KDEF changed to KJF, KDEG changed to KSG, KDEJ changed to KOJ, KDEK changed to KLK, KDEL changed to KRL, KDHM changed to KVM, KDHN changed to KDN, KDQA changed to KDA, KDQC changed to KOC, KFZP changed to KEP, KDTS changed to KIS, NJJ, NML, name changed to Oglala; WZC, strike out all particulars; WZJ, strike out all particulars.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS

[Alterations and corrections to be made to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1927]

AKRON, OHIO (8XAS).—W. I., 5.35–16.6 (56,000–18,100 kc.), 21.4–23.4 (14,000–12,825 kc.), 42.8–52.6 (7,005–5,700 kc.).

Strike out all particulars of the following-named stations: Bridgeport, Conn. (1XF); Cos Cob, Conn. (1XQ); New York, N. Y. (portable-2XBJ).

MISCELLANEOUS

Vessels equipped with a radio compass

[Additions to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1927, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Name	Call signal ¹	Owner
Ancon	KMS	Commercial:
California	WRS	Panama R. R. Co.
Cambria	WPY	American Line S. S. Corporation.
Crassida	WNBD	Bethlehem Transportation Corporation.
Cristobal	KMD	Herman Oelrichs.
Daniel J. Morrell	KGBD	Panama R. R. Co.
Edward Y. Townsend	KGBE	Cambria S. S. Co.
Emory L. Ford	KFKL	Do.
George G. Henry	WIT	Franklin S. S. Corporation.
Grand Haven		Pan American Petroleum & Transport Co.
Iroquois	KFGD	Grand Trunk & Milwaukee Car Ferry Co.
Lackawanna	WLT	New York & Miami S. S. Corporation.
Lebanon	WLK	Bethlehem Transportation Corporation.
Lehigh	WLN	Do.
Milwaukee		Do.
Nebraskan	WMV	Grand Trunk & Milwaukee Car Ferry Co.
Nevadan	WLZ	American Hawaiian S. S. Co.
Patricia		Do.
Shawnee	WOBG	Vincent Astor.
S. T. Crapo	WOBA	New York & Miami S. S. Corporation.
Steelton	WLX	Huron Transportation Co.
McCall	NJW	Bethlehem Transportation Corporation.
		Government: U. S. Coast Guard.

¹ Vessels which do not have a call signal are not equipped with apparatus for communication.

CHANGES IN RADIOBEACON STATIONS OF THE UNITED STATES

[Additions to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1927, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Stratford Shoal (Middle Ground) Light Station, N. Y.—W. I. changed to 1,034 meters (290 kilocycles).

Fire Island Lightship, N. Y.—W. I. changed to 1,017 meters (295 kilocycles).

Sea Girt Light Station, N. J.—W. I. changed to 1,034 meters (290 kilocycles).

Five Fathom Bank Lightship, N. J.—W. I. changed to 1,034 meters (290 kilocycles).

Jupiter Inlet Light Station, Fla.—Beacon established. Transmits every 180 seconds, groups of 1 dot and 3 dashes for 60 seconds, silent 120 seconds, thus:

. — — — . — — — etc.	Silent.
60 seconds.	120 seconds.

Beacon is operated on 1,034 meters (290 kilocycles) continuously during thick or foggy weather and daily in clear weather from 9 to 9.30 a. m. and p. m., seventy-fifth meridian time. Location: 80° 04' 56" W., 26° y56' 54" N. Radio communication service is not maintained.

Dry Tortugas Light Station, Fla.—Beacon established. Transmits every 180 seconds, groups of 3 dashes for 60 seconds, silent 120 seconds, thus:

— — — — — etc.	Silent.
60 seconds.	120 seconds.

Beacon is operated on 1,000 meters (300 kilocycles) continuously during thick or foggy weather and daily in clear weather from 2 to 2.30 and 8 to 8.30 a. m. and p. m., seventy-fifth meridian time. Location: 82° 55' 13" W., 24° 37' 59" N. Radio communication service is not maintained.

CHARACTERISTIC OF SAMBRO LIGHT VESSEL (NOVA SCOTIA) RADIOBEACON CHANGED AND SUBMARINE OSCILLATOR ESTABLISHED

The beacon has been changed to transmit 1 dot and 2 dashes for 1 minute, silent 1½ minutes. A submarine oscillator which sounds four groups of 5 dashes, each dash 1 second long, with 4 seconds between dashes and 9 seconds between groups and a 39-second interval at the end of each four groups, has been established on the vessel.

Ships equipped with radio and submarine signal receivers will be able to determine their distance from the lightship by noting the difference in time between the reception of the first dot of the radiobeacon and the first dash of the oscillator. This difference in time, in seconds, multiplied by 1,600, will give, approximately, the distance in yards of the ship from the lightship. Location (approximately): 63° 25' 50" W., 44° 21' 48" N.

RADIO-COMPASS SERVICE ESTABLISHED AT INDIAN STATIONS

The station at Bombay (VWB) now maintains an experimental compass service in addition to its regular service. The procedure for obtaining a bearing is as follows: The ship calls the station when within range, and, on receiving an acknowledgement, will transmit either a series of the letter V (. . . —), or a repetition of her own call signal, for a period of 3 minutes, after good and reliable observations have been taken or the ship's position has been accurately fixed by shore bearings.

The compass station will then send the true bearing as observed on the direction finder. The ship will reply with her correct true bearing observed as above, in order that the compass station can effect any necessary adjustments to the station's instruments. Watch is maintained for the compass service between 1,430 and 2,230, G. M. T.

Masters of vessels are requested to communicate with the station with a view to checking the bearings observed at the compass station by means of positions determined by the ordinary methods. The service is to be regarded for the present as experimental, and as many comparisons as possible are required. No charge will be made for the transmission or receipt of bearings until further notice. Correspondence concerning the results obtained should be addressed to the Assistant Divisional Engineer, Wireless Station, Santa Cruz, Bombay, India.

The compass station formerly at Karachi has been moved to 67° 09' 56" E., 24° 52' 44" N., and is now available for service, on 600 meters, spark, and 1,550 meters, c. w. The compass station works in conjunction with Karachi (VWK), which replies to requests for bearings on the above-cited wave lengths. As a temporary arrangement, bearings will be transmitted free of charge to ships and aircraft. The Government of India will accept no liability for any consequences directly resulting from any inaccuracy in the bearings given, from any failure in the service, or from any cause whatever.

An experimental compass station has been established in 88° 11' 51" E., 22° 10' 41" N., Hooghly River, Bay of Bengal, at Diamond Harbor, about 25

miles southward of Calcutta. This station works in conjunction with the Calcutta station (VWC), and the procedure for obtaining a bearing is similar to that used for the compass station at Karachi. Bearings will be furnished free of charge. Call signal, VWC; wave length, 600 meters.

COMPASS SERVICE ESTABLISHED FOR VESSELS APPROACHING DAIREN KO, KWANTUNG PENINSULA, CHINA

The following radio-compass stations have been established for the use of vessels approaching Dairen Ko: A control station, call signal JGDB, wave length 600 meters for receiving, 800 meters for transmitting (i. c. w.), range 170 miles, at Round Island Light Station; location $122^{\circ} 09' 30''$ E., $38^{\circ} 40' 27''$ N. A receiving station, call signal JGEB, range 170 miles, on the top of the railway company's wharf building at Dairen; location, $121^{\circ} 39' 00''$ E., $28^{\circ} 55' 45''$ N.

The following procedure has been prescribed for vessels desiring radio-compass bearings: The wave length employed for determining the bearing is 800 meters. In the event a ship can not transmit on that wave she will be permitted to use 600 meters, specifying in the preliminary signals that she intends to use that wave. The ship calls the control station in the usual manner on the 600-meter wave, making QTE (what is my true bearing?), in conjunction, if necessary, with a number indicating the wave length to be used for taking bearing. The control station acknowledges the signal, and when ready signal "K." The ship proceeds to transmit her call signal for 50 seconds, prolonging the dashes a little. The control station will then reply, making QTE (your true bearing from — is — degrees), expressing in degrees (0 to 360), indicating the true bearing of the ship from the station concerned and also the local standard time (0000 to 2400, commencing at midnight) at which the observation was taken. On receiving the result the ship will repeat the message to the control station, which will acknowledge it, or repeat, if necessary, and when satisfied that the ship has received it correctly will signal "OK" or "R."

A single bearing from the receiving station at Darien can be obtained by calling the control station in the usual manner on 600 meters, making QTE in conjunction with the call signal of the station required and following the procedure outlined above. No charge is made for bearings.

Mariners obtaining bearings are requested to forward a brief report to the Lighthouse Board, Yokohama, Japan, containing the following particulars: Name of vessel, date and local standard time at which radio bearing was taken, estimated position of ship at the above time by methods other than radio, the probable degree of accuracy of the estimated position, weather conditions at the time, remarks, if any.—(*Notice to Mariners 2686, Department of Communications, Tokyo, 1927.*)

LUNDY ISLAND (ENGLAND) RADIOBEACON DISCONTINUED

The experimental radiobeacon at North Lighthouse, Lundy Island, Bristol Channel, has been discontinued. It is intended to establish a permanent beacon at this lighthouse, but several months will elapse before the signal is in operation.

NAVIGATIONAL WARNINGS TRANSMITTED BY PUERTO LIMON (COSTA RICA) STATION

In view of the difficulty experienced by vessels in sighting Puerto Limon in heavy weather, especially early in the morning, this station has been instructed to send signals to all vessels approaching, commencing at 11.30, G. M. T.

If at any time ships anticipate bad weather in entering the port and desire signals to be sent earlier than 11.30, they should communicate with the station and position signals will be transmitted at an earlier hour. Call signal UX, location $83^{\circ} 03' W.$, $10^{\circ} 00' N.$

GENERAL CALL SIGNAL ASSIGNED TO MACKAY RADIO & TELEGRAPH CO.

Call signal KGMM has been assigned to the Mackay Radio & Telegraph Co. as a general call signal for all vessels operated by that company. Notice published in Radio Service Bulletin No. 128, November 30, 1927, incorrectly gave KGGM as the signal.

OPERATORS' LICENSE SUSPENDED

The department has suspended for a period of 30 days operators' licenses No. 16302, first class, third grade, issued August 24, 1926, at New York, and No. 986, first class, issued June 8, 1927, issued at New York, as the holders thereof violated article 6 of the International Convention service regulations (London, 1912) and section 5, paragraph D, subparagraph D, of the radio act of 1927, in that they transmitted superfluous signals by carrying on an unofficial conversation, thereby causing serious interference to the operation of other stations.

APPLICANT BARRED FROM EXAMINATION FOR RADIO OPERATOR

An applicant was barred for a period of six months from taking an examination for radio operator, as he had taken an examination within a period of three months after having failed in a previous examination.

INTERNATIONAL RADIOTELEGRAPH CONVENTION AND GENERAL AND SUPPLEMENTARY REGULATIONS RELATING THERETO

The text of the proceedings of the International Radiotelegraph Convention and the General Regulations adopted by and signed at the International Radiotelegraph Conference held in Washington from October 4 to November 25, 1927, may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 40 cents per copy. The title "International Radiotelegraph Convention, and General and Supplementary Regulations Relating Thereto" (S. Doc., 70th Cong.) should be mentioned when forwarding remittances.

The convention and its regulations were transmitted on December 12, 1927, to the United States Senate by the President for advice and consent to their ratification. Up to the present time no definite action has been taken by the Senate.

INDEPENDENT WIRELESS TELEGRAPH CO. PURCHASED BY THE RADIO CORPORATION OF AMERICA

The fixed assets, good will, and business of the Independent Wireless Telegraph Co. have been purchased by the Radio Corporation of America as of January 1, 1928, and the coastal station services, ship station services, and marine business of both companies will in future be conducted by a new R. C. A. subsidiary, known as the Radiomarine Corporation of America, 66 Broad Street, New York, N. Y.

The International List of Radiotelegraph Stations (Berne List) should be changed to show Radiomarine Corporation of America in lieu of Independent Wireless Telegraph Co. or Radio Corporation of America, in as far as the settlement of message accounts or concerned.

The list of "Commercial and Government Radio Stations of the United States" should be changed accordingly; that is, under the subheading "Station controlled by," R. M. C. A. (Radiomarine Corporation of America) should be shown in lieu of I. W. T. Co. or R. C. A.

AMENDED REGULATIONS GOVERNING THE ISSUANCE OF RADIO OPERATORS' LICENSES

1. *Commercial extra first class.*—To be eligible for examination an applicant for this class of license must have held a commercial first-class license and must have been actually engaged as an operator at stations open to public correspondence for at least 18 months during the two years previous to his application. A speed in transmission and reception of at least 30 words per minute, Continental Morse Code, and 25 words per minute, American Morse Code, five characters to the word, must be attained.

The questions in this examination will be considerably wider in scope than those used for commercial first-class licenses. A percentage of at least 80 will constitute a passing mark.

Holders of licenses of this class are authorized to operate any licensed radio station.

2. *Commercial first class.*—Applicants for this class of license must pass a code test in transmission and reception at a speed of at least 20 words per minute in Continental Morse Code (five characters to the word).

The practical and theoretical examination shall consist of comprehensive questions under the following headings:

- (a) Experience.
- (b) Diagram of receiving and transmitting apparatus.
- (c) Transmitting apparatus.
- (d) Receiving apparatus.
- (e) Operation and care of storage batteries.
- (f) Motors and generators.
- (g) International regulations governing radio communication and the United States Radio Laws and Regulations.

A percentage of 75 will constitute a passing mark for this class of license.

Holders of this class of license are authorized to operate any licensed radio station.

3. *Commercial second class.*—Applicants for this class of license must pass a code test in transmission and reception at a speed of at least 12 words per minute in Continental Morse Code (five characters to the word).

The practical and theoretical examination will cover the same subjects as required for the first-class license. A percentage of 65 will constitute a passing mark.

Holders of this class of license are authorized to operate only licensed radio stations not open to general public correspondence. This fact should be indicated by having all licenses of this class bear across their face, preferably in red, the following restriction: "This license not valid for the operation of any general public service station."

Applicants desiring to operate broadcasting stations only will be given an examination pertaining specifically to broadcasting apparatus. The licenses so issued will indicate this limitation by showing across their face, preferably in red, the following restriction: "This license valid only for the operation of a broadcasting station."

4. *Operator permits.*—In special cases where no interference with communications of other stations is involved, consideration will be given to applications for the operation of particular stations, without technical examination.

5. *Amateur license.*—Applicants for this grade of license must pass a code test in transmission and reception at a speed of at least 10 words per minute in Continental Morse Code (five characters to the word).

An applicant must pass an examination which will develop knowledge of the adjustment and operation of the apparatus which he desires to use and of the international regulations and acts of Congress in so far as they relate to interference with other radio communications and impose duties on all classes of operators. A percentage of 70 will constitute a passing mark. This license is valid for the operation of licensed amateur radio stations only.

6. *Temporary amateur license.*—Amateurs who can not be examined at time of application may be given temporary licenses valid for the operation of a particular station until such time as examination for a regular license can be held, but not to exceed a period of one year.

7. *Renewals.*—(a) *Commercial extra first class:* These licenses may be renewed without examination, provided the record shows 12 months' satisfactory service in a land or ship station open to general public service, at least 6 months of which must have been during the last 12 months of the license period. Holders of these licenses employed as radio inspectors, radio instructors, or in similar occupations requiring exceptional qualifications where the duties require the testing, or demonstrating, or otherwise using commercial radio apparatus and the telegraph codes may be issued renewals of their licenses without examination, provided such employment has covered a period of 18 months out of the two-year license period. Where the applicant has not regularly used the telegraph codes he will be given the code examination as for an original license, and if he has used only one code, he will be examined in the code not used.

(b) *Other renewals:* Renewal licenses may be issued to operators of other classes without examination, provided the operator has had three months' satisfactory service during the last six months of the license term. One year satisfactory service out of two years of the license term may be accepted for renewal at the discretion of the examining officer.

(c) Holders of commercial first-class radio operator licenses who have not had sufficient service at commercial stations to permit the unconditional renewal of such licenses, but indicate satisfactory service at broadcasting stations for the

length of time necessary for renewal and are unable to pass the required code test or to present themselves for a code test, may be issued restricted renewals of their existing licenses. The licenses so issued should bear across their face, preferably in red, the following restriction: "This license not valid for the operation of any limited or general public service station."

Holders of commercial second-class radio operator licenses who have passed the regular commercial second-class examination but have not had sufficient service at stations regularly using the Continental Code to permit unconditional renewal of such licenses, but indicate satisfactory service at broadcasting stations for the length of time necessary for renewal but are unable to pass the required code test or to present themselves for a code test may be issued restricted renewals of their existing licenses. The licenses so issued should bear across their face, preferably in red, the following restriction: "This license not valid for the operation of any limited or general public service station."

Applicants holding restricted commercial operators' licenses or broadcast operators' licenses may be issued renewals of such licenses provided the service records indicate three months' satisfactory service during the last six months of the license term. One year satisfactory service out of the two-year term of the license may be accepted at the discretion of the examining officer. Renewal commercial-class licenses so issued shall bear the indorsement "This license not valid for the operation of any limited or general public station," and renewal broadcast licenses should bear the indorsement "Valid only for the operation of a broadcasting station."

Applicants who have passed the regular commercial examination, but who hold renewal licenses indorsed "This license is not valid for the operation of any limited or general public service station," may be issued unconditional renewals of such licenses, provided they have the required service as indicated above and pass the code test required by the regulations for the class of license held by them.

(d) Renewals or new licenses may be issued a reasonable length of time previous to the expiration of existing licenses, but must bear the exact date of issue, which must correspond with the date on the back of Form 756 forwarded to the radio division.

Operators who fail to apply for renewal of their licenses on or prior to the date of expiration must be reexamined. If, because of circumstances over which the applicant has no control, an operator is unable to apply for renewal of license on or prior to the date of expiration, an affidavit may be submitted to the radio division through the supervisor of radio or examining officer, attesting to the facts, which will be considered by the radio division, which will advise the supervisor of radio or examining officer in regard to the issue of a renewal of the license without reexamination.

Service records must be completed and signed only by masters, employers, or the duly authorized agents of either.

Any improper alteration of the service record or the forgery of masters' or employers' signature constitutes a violation of the regulations, and the operator may suffer suspension of license for a period not exceeding one year, at the discretion of the Secretary of Commerce.

8. *Reexamination.*—No applicant who fails to qualify will be reexamined within three months from date of the previous examination. All examination papers, except amateur, whether the applicant qualifies or not, will be forwarded to the Department of Commerce, Radio Division, for filing.

REGULATIONS GOVERNING THE LICENSING AND OPERATION OF AMATEUR STATIONS

The Federal Radio Commission has established the following regulations governing the licensing and operation of amateur radio stations:

Amateur radio stations are authorized for communication only with similarly licensed stations and on wave lengths or frequencies within the following bands:

Kilocycles:

- 401,000 to 400,000.
- 64,000 to 56,000.
- 16,000 to 14,000.
- 8,000 to 7,000.
- 4,000 to 3,500.
- 2,000 to 1,500.

Meters:

- 0.7477 to 0.7496.
- 4.69 to 5.35.
- 18.7 to 21.4.
- 37.5 to 42.8.
- 75 to 85.7.
- 150 to 200.

and at all times unless interference is caused with other radio services, in which event a silent period must be observed between the hours of 8 and 10.30 p. m., local time, and on Sundays during local church services.

Amateur radio telephone operation will be permitted only in the following bands:

Kilocycles:	Meters:
64,000 to 56,000.	4.69 to 5.35.
14,500 to 14,000.	20.68 to 21.4.
2,000 to 1,580.	150 to 190.

Spark transmitters will not be authorized for amateur use.

Amateur stations must use circuits loosely coupled to the radiating system or devices that will produce equivalent effects to minimize key impacts, harmonics, and plate supply modulations. Conductive coupling, even though loose, will not be permitted, but this restriction shall not apply against the employment of transmission line feeder systems to Hertzian antennae.

Amateur stations are not permitted to communicate with commercial or Government stations unless authorized by the licensing authority except in an emergency or for testing purposes. This restriction does not apply to communication with small pleasure craft such as yachts and motor boats holding limited commercial station licenses which may have difficulty in establishing communication with commercial or Government stations.

Amateur stations are not authorized to broadcast news, music, lectures, sermons, or any other form of entertainment.

No person shall operate an amateur station except under and in accordance with an operator's license issued to him by the Secretary of Commerce.

TRANSMITTING SCHEDULES OF WASHINGTON (ARLINGTON) NAVAL STATION CHANGED

The transmitting schedules of Washington (Arlington (NAA)), exclusive of radiotelephone broadcast on 434.5 meters, 690 kc., are as follows:

8.15 a. m.—Special aviation weather on 74.7 meters, 4,015 kc.; 37.4 meters, 8,030 kc.; 24.9 meters, 12,045 kc.

10 a. m.—Marine weather—Major bulletin on 2,677 meters, 112 kc., and 18.6 meters, 16,060 kc., followed by ice reports (in season) on 2,677 meters, 112 kc.

11 a. m.—Angot message on 24.9 meters, 12,045 kc.

11.55 a. m.—Time on 2,677 meters, 112 kc.; 74.7 meters, 4,015 kc.; 37.4 meters, 8,030 kc.; 24.9 meters, 12,045 kc.

12 (noon).—Navigational warnings on 2,677 meters, 112 kc.

8.15 p. m.—Special aviation weather on 74.7 meters, 4,015 kc.

9.55 p. m.—Time on 2,677 meters, 112 kc.; 74.7 meters, 4,015 kc.; 37.4 meters, 8,030 kc.; 24.9 meters, 12,045 kc.

10 p. m.—Marine weather—Major bulletin, followed by ice reports (in season) and navigational warnings on 8,328 meters, 36 kc. (this wave length is discontinued at 11 p. m.), and 2,677 meters, 112 kc.

11 p. m.—Angot message on 74.7 meters, 4,015 kc.

All times given are eastern standard. Time, weather, and navigational warnings are sent on a. c. w.

TIME SIGNALS BY MOGDISHU (MOGADISCIO), ITALIAN SOMALILAND STATION

Time signals are now transmitted by this station daily at 0900 G. M. T., corresponding to 1200 standard time. Preliminary signals are transmitted at 0852 and 0858.

LIST OF MASTER CONTROL AND ALTERNATE CONTROL STATIONS OF THE NAVAL COMMUNICATION RESERVE

The stations named below have been assigned naval call signals to date, as follows:

Naval district	Call signal	Location	Amateur call signal where authorized
First.....	NRRA	Wellesley, Mass.....	1BTR
Third.....	NRRC	District headquarters, New York, N. Y.....	
Fourth.....	NRRD	Darby, Pa.....	3BTU
Fifth.....	NRRE	Naval operating base, Hampton Roads, Va.....	
Fifth ¹	NRRK	Richmond, Va.....	3ANM
Seventh.....	NRRG	Winter Park, Fla.....	4NKF
Seventh ¹	NRRQ	Jacksonville, Fla.....	4RA
Ninth.....	NRRL	Madison, Wis.....	9XH
Ninth ¹	NRRL	Minnetka, Ill.....	9ZN
Twelfth.....	NRRB	Oakland, Calif.....	6ND

¹ Alternate.

INTERNATIONAL ICE-PATROL SERVICE

The Coast Guard cutters *Modoc* and *Mojave* have been detailed for the season of 1928 to carry on the international ice-observation and ice-patrol service provided for by the international convention for the safety of life at sea at London in 1913 and 1914.

The object of the ice-patrol service is to locate the icebergs and field ice nearest to the trans-Atlantic steamship lane. It will be the duty of the patrol vessels to determine the southerly, easterly, and westerly limits of the ice and to keep in touch with these fields as they move to the southward in order that radio messages may be sent out daily giving the whereabouts of the ice, particularly the ice that may be in the immediate vicinity of the regular trans-Atlantic steamship lanes.

During the months of March, April, May, and June, and as much longer as necessary, these two vessels will base on Halifax, Nova Scotia. The patrol will be continuous, and the vessel on patrol will not leave her station until relieved by the other vessel unless it is absolutely necessary to do so.

Having located the ice, the vessel on patrol will transmit four daily radio broadcasts, giving ice information, for the benefit of shipping, each broadcast being repeated three times with an interval of two minutes between each repeat. Each broadcast will be preceded by the general call QST on 600 meters (500 kilocycles) wave length, immediately followed by the ice broadcast on the wave length specified, as follows:

Time	G. C. T.	Seventy-fifth meridian	Wave length	Frequency
			Meters	Kilocycles
0000.....		1900	1,713	175
1100.....		0600	706	425
1200.....		0700	1,713	175
2300.....		1800	706	425

Ice information will be given by radio at any time to any ship with which the patrol vessel can communicate. Such information will be furnished as regular radio traffic (without charge) on commercial traffic frequencies (wave lengths).

Ice-information broadcasts will be given in as plain, concise English as practicable and will state in the following order: (a) Position of patrol vessel, (b) location and description of ice, (c) other data.

The ice-patrol vessels' general radio call letters are NIDK. This is a special call for the vessel actually on patrol and should not be confused with the regular radio call letters assigned to the individual vessels.

The work of the United States Coast Guard cutters engaged on this ice-patrol duty will be greatly facilitated if the principal trans-Atlantic steamships report the following data by radio to the patrol vessels:

(a) Icebergs or obstructions sighted, giving date, time (G. C. T.), latitude, longitude, set, and drift; and in case it is an iceberg the temperature of the water at the time should be included.

(b) Surface temperature of the sea water every four hours when between latitude 39° N. and 48° N. and between longitude 43° W. and 58° W. when bound either east or west and giving time of observation (G. C. T.), the latitude and longitude, course, and speed.

These data will facilitate the drawing of a temperature curve which will be useful in locating the branches of the Labrador current.

It is requested that radio operators desist, as far as practicable, from operating at the above times in order to lessen radio interference.

VESSELS CLEARING CHILEAN PORTS REQUIRED TO BE EQUIPPED WITH RADIO TRANSMITTERS

Beginning January 25, 1928, mechanically propelled vessels of more than 500 tons and sailing vessels of over 1,000 tons (both Chilean and foreign) will not be permitted to clear from ports of the Republic unless equipped with a radiotelegraph installation permitting communication during the day at sea in an effective manner, covering a distance of 200 nautical miles and without having on board a personnel capable of operating said installation.

LIST OF BRITISH STATIONS TRANSMITTING NAVIGATIONAL WARNINGS

Radio navigational warnings, containing information relating to derelicts, temporary extinction of lights or displacement of principal aids to navigation, drifting mines, and other important hydrographic matter, are transmitted to shipping. Full particulars are given in the undermentioned schedule.

Schedule

Station	Call signal	Position (latitude, longitude)	Time (G. M. T.)	Wave (meters)	Additional details
Nilton	GNI	50 35 N. 1 17 W.		600	Does not broadcast but advises ships approaching or leaving the port of Southampton.
Land's End	GLD	50 07 N. 5 40 W.	0200, 0800, 1400, 2000	600	Broadcasts to shipping in the English Channel and Bay of Biscay.
Fishguard	GRL	52 01 N. 4 59 W.	0218, 0818, 1418, 2018	600	Broadcasts to shipping approaching or leaving St. Georges and Bristol Channels.
Seaforth	GLV	53 28 N. 3 01 W.		600	Does not broadcast but advises ships approaching the port of Liverpool of dangers within the area bounded by Northwest Mark (Formby Point)—Northwest Lightboat—Hilbre islet. Vessels leaving the River Mersey and requiring such warnings by wireless can obtain them on request of this station at the usual coast station charges for inquiry and reply.
Port Patrick	GPK	54 51 N. 5 07 W.	0218, 0818, 1418, 2018	600	Broadcasts to shipping in the North Channel and Firth of Clyde.
Wick	GKR	58 26 N. 3 06 W.	0200, 0800, 1400, 2000	600	Broadcasts to shipping in the North Sea, and to shipping approaching or leaving the Pentland Firth.
Cullercoats	GCC	55 02 N. 1 26 W.	0218, 0818, 1418, 2018	600	Broadcasts to shipping in the North Sea.
Humber	GKZ	53 20 N. 0 17 E.		600	Does not broadcast but advises ships approaching or leaving the Humber.
North Foreland	GNF	51 22 N. 1 27 E.	0200, 0800, 1400, 2000	600	Broadcasts to shipping in the English Channel and North Sea. Information re wrecks in River Thames above Southend will only be broadcast immediately after the casualty and at each scheduled hour of broadcast for the following 24 hours, after which no further transmission will be made.
Valencia	GCK	51 56 N. 10 21 W.	0218, 0818, 1418, 2018	600	Broadcasts to shipping in the Atlantic.
Malin Head	GMH	55 22 N. 7 20 W.	0200, 0800, 1400, 2000	600	Do.

All warnings are preceded by the radio danger call — — — (TTT), repeated at short intervals 10 times on full power; the warning is broadcast one minute later. The warnings are first of all broadcast immediately upon receipt by the station concerned and then at the above-mentioned times.

A repetition of any warning can be obtained by request to the station concerned at the usual coast station charge for inquiry and reply. Operators should, however, make every effort to get the warning at the scheduled hours of transmission.

Warnings relating to lights on light buoys, etc., will not be broadcast at 0800 or 0818 throughout the year or at 1400 and 1418 during May 13 to August 6. Warnings will be broadcast at the scheduled hours as long as may be necessary, but the cancellation of a previous warning will not be broadcast except under special circumstances.—Admiralty Notice to Mariners No. 9, London, January 2, 1928.

List of broadcasting stations, alphabetically by call signal

Call signal	Location of station ¹	Owner of station	Power (watts)	Wave length	Frequency (kilo-cycles)
KDKA	East Pittsburgh, Pa.	Westinghouse Electric & Manufacturing Co.	50,000	315.6	950
KDLR	Devils Lake, N. Dak.	Radio Electric Co.	15	230.6	1,300
KDYL	Salt Lake City, Utah, Ezra Thompson Building.	Intermountain Broadcasting Corporation.	500	234.2	1,280
KELW	{Burbank, Calif., 3702 Magnolia Avenue.}	Earl L. White.	{ 1,500 11,000 }	228.9	1,310
KEX	Portland, Oreg.	Western Broadcasting Co.	2,500	239.9	1,250
KFAB	Lincoln, Nebr., Thirteenth and Q Streets.	Nebraska Buick Auto Co.	5,000	319.0	940
KFAD	Phoenix, Ariz., 312 North Central Street.	Electrical Equipment Co.	500	272.6	1,100
KFAU	Boise, Idaho.	{Boise High School (independent school district of Boise City).}	{2,000 4,000 }	285.5	1,050
KFBB	Havre, Mont.	F. A. Buttrey Co.	50	275.1	1,060
KFBC	San Diego, Calif., 207 Electric Building.	Arthur W. Yale.	100	247.8	1,210
KFBK	Sacramento, Calif., 607 K Street.	Kimball-Upson Co.	100	535.4	560
KFBL	Everett, Wash., 2814 Rucker Avenue.	Leese Bros.	50	223.7	1,340
KFBU	Laramie, Wyo., St. Matthews Cathedral.	Bishop N. S. Thomas.	500	463.6	620
KFCB	Phoenix, Ariz., 311 North Central Avenue.	Nielsen Radio Supply Co.	125	243.8	1,230
KFCR	Santa Barbara, Calif., 1200 Anacapa Street.	Santa Barbara Broadcasting Co.	50	211.1	1,420
KFDM	Beaumont, Tex.	Magnolia Petroleum Co.	500	483.6	620
KFDX	Shreveport, La.	First Baptist Church.	250	236.1	1,270
KFDY	Brookings, S. Dak.	South Dakota State College.	500	545.1	550
KFDZ	Minneapolis, Minn., 2510 Thomas Avenue south.	Harry O. Iverson.	10	215.7	1,390
KFEC	Portland, Oreg.	Meier & Frank Co.	50	214.2	1,400
KFEL	Denver, Colo., 233 East Colfax Street.	Eugene P. O'Fallon (Inc.)	250	247.8	1,210
KFEQ	St. Joseph, Mo.	Scroggin & Co. Bank.	1,000	230.6	1,300
KFEY	Kellogg, Idaho.	Union High School.	10	232.4	1,290
KFGQ	Boone, Iowa.	Boone Biblical College.	10	209.7	1,430
KFH	Wichita, Kans.	Hotel Lassen.	500	245.8	1,220
KFHA	Gunnison, Colo.	Western State College of Colorado.	50	254.1	1,180
KFHL	Oskaloosa, Iowa.	Penn College.	10	212.6	1,400
KFI	Los Angeles, Calif., Tenth and Hope Streets.	Earle C. Anthony (Inc.)	5,000	468.5	640
KFIF	Portland, Oreg.	Benson Polytechnic Institute.	50	214.2	1,400
KFIO	Spokane, Wash.	North Central High School.	100	245.8	1,220
KFIU	Juneau, Alaska.	Alaska Electric Light & Power Co.	10	225.4	1,330
KFIZ	Fond du Lac, Wis., 18 Forest Avenue.	Fond du Lac Commonwealth Reporter.	100	267.7	1,120
KFJB	Marshalltown, Iowa.	Marshall Electric Co.	{ 100 250 }	247.8	1,210
KFJF	Oklahoma, Okla.	National Radio Manufacturing Co.	{ 750 1,000 }	272.6	1,100
KFJI	Astoria, Oreg.	E. E. Marsh.	15	249.9	1,200
KFJM	Grand Forks, N. Dak.	University of North Dakota.	100	333.1	900

¹ The street shown is the post-office address of the owner and not necessarily the street location of the transmitter. In some cases the post-office address is in a city other than where the transmitter is located. Construction permits have been issued for removal of several stations, however, and new data pertaining thereto will not be published until new licenses have been issued.

² Night.
³ Day.

List of broadcasting stations, alphabetically by call signal—Continued

Call signal	Location of station	Owner of station	Power (watts)	Wave length	Frequency (kilo-cycles)
KFJR	Portland, Oreg., 95 Fifth Street.	Ashley C. Dixon & Son.....	100	282.8	1,060
KFJY	Fort Dodge, Iowa, 1004 Central Avenue.	Tunwall Radio Co.....	100	232.4	1,290
KFJZ	Fort Worth, Tex., 3219 Avenue L.	W. E. Branch.....	50	249.9	1,200
KFKA	Greeley, Colo.....	Colorado State Teachers College.....	200	249.9	1,200
KFKB	Milford, Kans.....	J. R. Brinkley, M. D.....	2,500	241.8	1,240
KFKU	Lawrence, Kans.....	University of Kansas.....	500	254.1	1,180
KFKX	Chicago, Ill.....	Westinghouse Electric & Manufacturing Co.....	2,500	526.	570
KFKZ	Kirksville, Mo.....	Northeast Missouri State Teachers College.....	15	225.4	1,330
KFLV	Rockford, Ill.....	Swedish Evangelical Mission Church.....	100	267.7	1,120
KFLX	Galveston, Tex., 3327 Avenue P.	George R. Clough.....	100	270.1	1,110
KFMR	Sioux City, Iowa.....	Morningside College.....	100	232.4	1,290
KFMX	Northfield, Minn.....	Carleton College.....	500	236.1	1,270
KFNF	Shenandoah, Iowa.....	Henry Field Seed Co.....	2,000	461.3	650
KFOA	Seattle, Wash., 1321 Second Avenue.	Rhodes Department Store.....	1,000	447.5	670
KFON	Long Beach, Calif., Jergens Trust Building.	Nichols & Warinner (Inc.).....	500	241.8	1,240
KFOR	Lincoln, Nebr.....	Howard A. Shuman.....	100	217.3	1,380
KFOX	Omaha, Nebr.....	Technical High School (Board of Education).	100	258.5	1,160
KFOY	St. Paul, Minn., Fourth and Robert Streets.	Maurice G. Goldberg.....	250	222.1	1,350
KFPL	Dublin, Tex., 1105 Grafton Street.	C. C. Baxter.....	15	275.1	1,090
KFPM	Greenville, Tex.....	New Furniture Co.....	15	230.6	1,300
KFPR	Los Angeles, Calif.....	Los Angeles County Forestry Department.	250	232.4	1,290
KEPW	Cartersville, Mo.....	Rev. L. W. Stewart (St. Johns Church, South).	50	263.0	1,140
KFPY	Spokane, Wash., Howard Street and Sprague Avenue.	Symons Investment Co.....	250	245.8	1,220
KFQA	St. Louis, Mo., 5539 Page Avenue.	The Principia.....	50	234.2	1,280
KFQB	Fort Worth, Tex., Westbrook Hotel.	Lone Star Broadcast Co.....	1,000	333.1	900
KFQD	Anchorage, Alaska.....	Anchorage Radio Club.....	100	344.6	870
KFQU	Alma (Holy City), Calif.....	W. E. Riker.....	100	249.9	1,200
KFQW	Seattle, Wash., 315 Seneca Street.	K F Q W (Inc.).....	100	217.3	1,350
KFQZ	Hollywood, Calif.....	Taft Radio & Broadcasting Co.....	100	232.4	1,290
KFRG	San Francisco, Calif.....	Don Lee (Inc.).....	1,000	454.3	660
KFRU	Columbia, Mo.....	Stephens College.....	500	249.9	1,200
KFRS	San Diego, Calif., 326 Broadway.	Airman Radio Corporation.....	500	440.9	680
KFSG	Los Angeles, Calif., 1100 Gledale Boulevard.	Echo Park Evangelistic Association.	500	275.1	1,090
KFUL	Galveston, Tex., 2126 Market Street.	Thomas Goggan & Bros.....	500	258.5	1,160
KFUM	Colorado Springs, Colo., 114 West Del Norte Street.	W. D. Corley.....	1,000	252.8	1,060
KFUO	Clayton, Mo.....	Concordia Theological Seminary.....	2,100	545.1	550
KFUP	Denver, Colo.....	Fitzsimons General Hospital.....	100	227.1	1,320
KFUR	Ogden, Utah.....	Peery Building Co.....	50	225.4	1,330
KFUS	Oakland, Calif., 1444 Havenscourt Boulevard.	Louis L. Sherman.....	50	258.3	1,170
KFUT	Salt Lake City, Utah.....	University of Utah.....	50	249.9	1,200
KFVD	San Pedro (Venice), Calif., 1825 South Pacific Avenue.	W. J. and C. I. McWhinnie.....	250	208.2	1,440
KFVG	Independence, Kans.....	First Methodist Episcopal Church	50	225.4	1,330
KFVI	Houston, Tex.....	Fifty-sixth Cavalry Brigade, Headquarters Troop.	50	238.0	1,260
KFVS	Cape Girardeau, Mo., 312 South Frederick Street.	Hirsch Battery & Radio Co.....	50	223.7	1,340
KFWB	Hollywood, Calif., 5842 Sunset Boulevard.	Warner Brothers Broadcasting Corporation.	500	361.2	830
KFWC	Ontario, Calif., Fifth and E Streets.	Lawrence E. Wall.....	100	222.1	1,350
KFWF	St. Louis, Mo., 4030 Lindell Boulevard.	St. Louis Truth Center.....	250	214.2	1,400
KFWI	San Francisco, Calif., 1400 Van Ness Avenue.	Radio Entertainments (Inc.).....	500	267.7	1,120

* Night.

* Day.

* 6 a. m. to 7 p. m.

List of broadcasting stations, alphabetically by call signal—Continued

Call signal	Location of station	Owner of station	Power (watts)	Wave length	Frequency (kilo-cycles)
KFWM	Oakland, Calif.	Oakland Educational Society	{ ² 500 ¹ 1,000	236.1	1,270
KFWO	Avalon, Calif.	Lawrence Mott	250	299.8	1,000
KFXD	Jerome, Idaho	Service Radio Co.	{ ² 15 ³ 50	204.0	1,470
KFXK	Denver, Colo., 209 Sixteenth Street.	Pikes Peak Broadcasting Co.	250	282.8	1,060
KFXJ	Edgewater, Colo. (near)	R. G. Howell (Olinger Gardens)	50	215.7	1,390
KFXR	Oklahoma, Okla., 1305 Pennsylvania Street.	Exchange Avenue Baptist Church.	50	223.7	1,340
KFXY	Flagstaff, Ariz.	Miss Mary M. Costigan (Orpheum Theater).	25	205.4	1,460
KFYO	Breckenridge, Tex.	Kirksey Bros. Battery & Electric Co.	15	211.1	1,420
KFYR	{Bismarck, N. Dak., 200 Fourth Street.	{Hoskins-Meyer (Inc.)	{ ² 250 ³ 500	{249.9	{1,200
KGA	Spokane, Wash., 325 Rowan Avenue.	Northwest Radio Service Co.	2,000	260.7	1,150
KGAR	Tucson, Ariz., 80 South Stone Avenue.	Citizen Publishing Co. (Tucson Citizen).	100	234.2	1,280
KGBU	Ketchikan, Alaska	Alaska Radio & Service Co.	500	399.8	750
KGBX	St. Joseph, Mo., 1221 Frederick Avenue.	Foster-Hall Tire Co.	100	288.3	1,040
KGBY	Columbus, Nebr.	Thelen & Taddiken	50	222.1	1,350
KGBZ	York, Nebr., 715 Grant Avenue	Federal Live Stock Remedy Co. (George R. Miller).	100	212.6	1,410
KGCA	Decorah, Iowa	Charles W. Greenley	10	247.8	1,210
KGCB	Oklahoma, Okla., 103 West Thirteenth Street.	Wallace Radio Institute.	50	215.7	1,390
KGCH	Wayne, Nebr.	Wayne Hospital (S. A. Lutgen)	250	293.9	1,020
KGCI	San Antonio, Tex., 409 South Flores Street.	Liberto Radio Sales.	100	220.4	1,360
KGCL	Seattle, Wash., 1107 Second Avenue.	Louis Wasmer and Archie Taft	50	230.6	1,300
KGCN	Concordia, Kans.	Concordia Broadcasting Co.	50	208.2	1,440
KGCR	Brookings, S. Dak.	Cutler's Radio Broadcasting Service (Inc.)	15	208.2	1,440
KGCU	Mandan, N. Dak.	Mandan Radio Association	100	239.9	1,250
KGCX	Vida, Mont.	First State Bank of Vida.	10	243.8	1,230
KGDA	Dell Rapids, S. Dak.	Home Auto Co. (J. R. Nelson)	15	254.1	1,180
KGDE	Barrett, Minn.	Jaren Drug Co.	50	205.4	1,460
KGDM	Stockton, Calif., 42 South California Street.	E. F. Peffer	10	217.3	1,380
KGDP	Pueblo, Colo., 2927 High Street	Boy Scouts of America, Pueblo, Council.	10	223.7	1,340
KGDR	San Antonio, Tex., 208 Laurel Heights Place.	Joe B. McShane	15	206.8	1,450
KGDW	Humboldt, Nebr.	Frank J. Rist Plainview hog and seed farm.	100	293.9	1,020
KGDY	Oldham, S. Dak.	J. Albert Loesch	15	206.8	1,450
KGEF	Los Angeles, Calif.	Trinity Methodist Church	500	263.0	1,140
KGEK	Yuma, Colo., 109 West Second Avenue.	Beehler Electrical Equipment Co.	10	263.0	1,140
KGEN	El Centro, Calif.	E. R. Irely and F. M. Bowles	15	225.4	1,330
KGEO	Grand Island, Nebr.	Hotel Yancey	100	205.4	1,460
KGEQ	Minneapolis, Minn., 920 Fifth Avenue North.	Fred W. Herrmann	50	204.0	1,470
KGER	Long Beach, Calif., 435 Pine Avenue.	C. Merwin Dobyns	100	215.7	1,390
KGES	Central City, Nebr., 1516 Twenty-third Street.	Central Radio Electric Co.	10	204.0	1,470
KGEW	Fort Morgan, Colo.	City of Fort Morgan	{ ² 100 ³ 200	{218.8	{1,370
KGEY	Denver, Colo., 1917 East Twenty-eighth Avenue.	J. W. Dietz	15	201.2	1,490
KGEZ	Kalispell, Mont.	Flathead Broadcasting Association	100	293.9	1,020
KGFB	Iowa City, Iowa, 205 East College Street.	Albert C. Dunkel	10	223.7	1,340
KGFF	Alva, Okla.	Earl E. Hampshire	25	205.4	1,460
KGFG	Oklahoma, Okla.	Full Gospel Church	50	215.7	1,390
KGFH	La Crescenta, Calif.	Frederick Robinson	250	223.7	1,340
KGFI	San Angelo, Tex.	M. L. Eaves, pastor First Presbyterian Church.	15	220.4	1,360
KGFJ	Los Angeles, Calif., 233 West Twenty-first Street.	Ben S. McGlashan	100	208.2	1,440
KGFK	Hallock, Minn.	Kittson County Enterprise	50	223.7	1,340
KGFL	Raton, N. Mex.	N. L. Cotter	50	222.1	1,350

² Night

³ Day.

List of broadcasting stations, alphabetically by call signal—Continued

Call signal	Location of station	Owner of station	Power (watts)	Wave length	Frequency (kilo-cycles)
KGFN	Aneta, N. Dak.	Haraldson and Thingstad	15	199.9	1,500
KGFO	Los Angeles, Calif. (portable), 2055 North Thirteenth Street, Terre Haute, Ind.	Brant Radio Power Co.	100	204.0	1,470
KGFW	Ravenna, Nebr.	Otto F. Sothman	10	296.9	1,010
KGFX	Pierre, S. Dak., 510 Summit Avenue.	Dana McNeil	200	254.1	1,180
KGGE	Picher, Okla.	Dr. D. L. Connell	100	206.8	1,460
KGGH	Cedar Grove, La.	Bates Radio & Electric Co.	50	212.6	1,410
KGGM	Inglewood, Calif. (portable)	Jay Peters	100	204.0	1,470
KGHB	Honolulu, Hawaii	Radio Sales Co.	250	227.1	1,320
KGHC	Slayton, Minn.	Hegsted Radio Co.	15	209.7	1,430
KGHF	Pueblo, Colo.	Philip G. Lasky and J. H. Albert	250	209.7	1,430
KGHP	Hardin, Mont.	Hardin Post No. 8 American Legion.	50	263.0	1,140
KGO	Oakland, Calif., 5555 East Fourteenth Street.	General Electric Co.	5,000	384.4	780
KGRC	San Antonio, Tex., 103 San Pe- dro Avenue.	Gene Roth & Co.	100	220.4	1,360
KGRS	Amarillo, Tex., 108 East Eighth Street.	Gish Radio Service	250	243.8	1,230
KGTT	San Francisco, Calif.	Glad Tidings Temple and Bible Institute.	50	206.8	1,450
KGU	Honolulu, Hawaii, 217 South King Street.	Marion A. Mulrony	600	270.1	1,110
KGW	Portland, Oreg., Sixth and Alder Streets.	Portland Morning Oregonian	1,000	491.5	610
KGY	Lacey, Wash.	St. Martins College	50	243.8	1,230
KHAC	Airplane, 6138 Fulton Street, San Francisco, Calif.	Flying Broadcasters (Inc.)	50	204.0	1,470
KHJ	Los Angeles, Calif., 100 North Broadway.	Don Leo (Inc.)	500	436.4	720
KHMC	Harlingen, Tex.	Harlingen Music Co.	100	236.1	1,270
KHQ	Spokane, Wash., Davenport Hotel.	Louis Wasmer	1,000	370.2	810
KICK	Atlantic, Iowa.	Atlantic Automobile Co.	100	322.4	930
KIOS	Eugene, Oreg.	Eugene Broadcast Station	50	201.2	1,490
KJBS	San Francisco, Calif., 1360 Bush Street.	Julius Brunton & Sons Co.	50	220.4	1,360
KJR	Seattle, Wash., 611 Terminal Sales Building.	Northwest Radio Service Co.	2,500	348.6	860
KKP	Seattle, Wash.	City of Seattle, Harbor Depart- ment.	15	265.3	1,130
KLCN	Blytheville, Ark.	Daily Courier-News	50	285.5	1,050
KLDS	Independence, Mo.	Reorganized Church of Jesus Christ of Latter Day Saints.	1,500	270.1	1,110
KLIT	Portland, Oreg., 475 Twenty- first Street.	Lewis I. Thompson	10	206.8	1,450
KLS	Oakland, Calif., 2201 Telegraph Avenue.	Warner Bros.	250	245.8	1,220
KLX	Oakland, Calif., Thirteenth and Franklin Streets.	Oakland Tribune	500	308.2	590
KLZ	Denver, Colo., Seventeenth and Broadway.	Reynolds Radio Co.	750	296.0	1,010
KMA	Shenandoah, Iowa.	May Seed & Nursery Co.	1,000	394.5	760
KMBC	Independence, Mo.	Midland Broadcasting Co. and Reorganized Church of Jesus Christ of Latter Day Saints.	1,500	270.1	1,110
KMED	Medford, Oreg., Sparta Build- ing.	W. J. Virgin	50	249.9	1,200
KMIC	Inglewood, Calif., 219 North Market Street.	James R. Fouch	250	223.7	1,340
KMJ	Fresno, Calif.	Fresno Bee	50	365.6	820
KMMJ	Clay Center, Nebr.	M. M. Johnson Co.	250	285.5	1,050
KMO	Tacoma, Wash., Hotel Win- throp.	K M O (Inc.)	250	254.1	1,180
KMOX	Kirkwood, Mo., Hotel Mayfair.	Voice of St. Louis (Inc.)	5,000	299.8	1,000
KMTR	Los Angeles, Calif., 1025 North Highland Avenue	K M T R Radio Corporation	500	226.0	570
KNRC	Santa Monica, Calif., Municipal Auditorium.	Clarence B. Juneau	500	374.8	800
KNX	Los Angeles, Calif.	Western Broadcast Co.	500	336.9	890
KOA	Denver, Colo., 1370 Krameria Street.	General Electric Co.	2,500	325.9	920
KOAC	Corvallis, Oreg.	Oregon State Agricultural College.	500	270.1	1,110
KOB	State College, N. Mex.	New Mexico College of Agricul- ture and Mechanic Arts.	5,000	394.5	760

* Night.

* Day.

List of broadcasting stations, alphabetically by call signal—Continued

Call signal	Location of station	Owner of station	Power (watts)	Wave length	Frequency (kilocycles)
KOCH	Omaha, Nebr.	Omaha Central High School	250	268.5	1,160
KOCW	Chickasha, Okla., 1800 Eighteenth Street.	Oklahoma College for Women	250	252.0	1,190
KOIL	Council Bluffs, Iowa, 1124 South Sixth Street.	Mona Motor Oil Co.	5,000	319.0	940
KOIN	Sylvan, Oreg.	K O I N (Inc.)	1,000	319.0	940
KOMO	Seattle, Wash., Harbor Island	Fisher's Blend Station (Inc.)	1,000	305.9	980
KOW	Denver, Colo., 1429 Champa Street.	The Olinger Corporation Broadcasting.	250	247.8	1,210
KPCB	Seattle, Wash., 505 Central Building.	Pacific Coast Biscuit Co.	50	290.6	1,300
KPJM	Prescott, Ariz., box 730	Frank Wilburn	15	214.2	1,400
KPLA	Los Angeles, Calif., Commercial Exchange Building.	Pacific Development Radio Co.	500	252.0	1,190
KPNP	Muscatine, Iowa, 213 Chestnut Street.	Central Radio Co.	100	211.1	1,420
KPO	San Francisco, Calif., Fifth and Market Streets.	Hale Bros. and The Chronicle	1,000	422.3	710
KPPC	Pasadena, Calif.	Pasadena Presbyterian Church	50	228.9	1,310
KPRC	Houston, Tex.	Post Dispatch (Houston Printing Co.)	500	203.9	1,020
KPSN	Pasadena, Calif.	Pasadena Star News	1,000	315.6	950
KQV	Pittsburgh, Pa., 719 Liberty Avenue.	Doubleday-Hill Electric Co.	500	270.1	1,110
KQW	San Jose, Calif.	First Baptist Church	500	296.9	1,010
KRAC	Shreveport, La., 504 Wall Street.	Caddo Radio Club	50	220.4	1,360
KRE	Berkeley, Calif.	First Congregational Church	100	256.3	1,170
KRLD	Dallas, Tex., Adolphus Hotel	K R L D (Inc.)	500	461.3	650
KRLO	Los Angeles, Calif., 218 North Larchmont Boulevard.	Freeman Lang and A. B. Scott	250	215.7	1,390
KRSC	Seattle, Wash., 1202 Fifth Avenue.	Radio Sales Corporation	50	211.1	1,420
KSAC	Manhattan, Kans.	Kansas State Agricultural College	500	333.1	900
KSBA	Shreveport, La., Youree Hotel	W. G. Patterson	1,000	267.7	1,120
KS CJ	Sioux City, Iowa	Sioux City Journal (Perkins Bros. Co.)	1,500	243.8	1,230
KSD	St. Louis, Mo.	St. Louis Post Dispatch (Pulitzer Publishing Co.)	500	545.1	550
KSEI	Pocatello, Idaho, 141 South Sixth Avenue.	K S E I Broadcasting Association	250	333.1	900
KSL	Salt Lake City, Utah, 47 W. S. Temple Street.	Radio Service Corporation of Utah	1,000	302.8	990
KSMR	Santa Maria, Calif.	Santa Maria Valley R. R. Co.	100	272.6	1,100
KSO	Clarinda, Iowa	A. A. Berry Seed Co.	500	227.1	1,320
KSOO	Sioux Falls, S. Dak., Carpenter Hotel.	Sioux Falls Broadcast Association	250	209.7	1,430
KTAB	Oakland, Calif., 1410 Tenth Avenue.	Associated Broadcasters	500	280.2	1,070
KTAP	San Antonio, Tex., 822 West Mulberry Street.	Robert B. Bridge	20	228.9	1,310
KTBI	Los Angeles, Calif., 536 South Hope Street.	Bible Institute of Los Angeles	500	288.3	1,040
KTBR	Portland, Oreg., 153 Sixteenth Street.	M. E. Brown	50	282.8	1,060
KTHS	Hot Springs, Ark.	Arlington Hotel Co.	1,000	384.4	780
KTNT	Muscatine, Iowa	Norman Baker	2,000	256.3	1,170
KTSA	San Antonio, Tex., Plaza Hotel	Alamo Broadcast Co.	2,000	265.3	1,180
KTUE	Houston, Tex., 614 Fannin Street.	Uhalt Electric	5	212.6	1,410
KTW	Seattle, Wash., Seventh Avenue and Spring Street.	First Presbyterian Church	1,000	394.5	760
KUJ	Seattle, Wash., 20 North Tacoma Avenue, Tacoma, Wash.	Puget Sound Radio Broadcasting Co.	10	199.9	1,500
KUOA	Fayetteville, Ark.	University of Arkansas	500	296.9	1,010
KUOM	Misoula, Mont.	University of Montana	500	461.3	650
KUSD	Vermillion, S. Dak.	University of South Dakota	230	483.6	620
KUT	Austin, Tex.	University of Texas	500	232.4	1,290
KVI	Tacoma, Wash., 20 Tacoma Avenue.	Puget Sound Radio Broadcasting Co.	50	234.2	1,280
KVL	Seattle, Wash., Moore Hotel	Arthur C. Dailey	100	202.6	1,430
KVOO	Bristow, Okla., Roland Hotel	Southwestern Sales Corporation	1,000	348.6	860
KVOS	Bellingham, Wash., 1366 State Street.	L. Kessler	50	209.7	1,430
KWBS	Portland, Oreg., 226 East Forty-first Street.	Schaeffer Radio Co.	15	199.9	1,500
KWCR	Cedar Rapids, Iowa, 1444 Second Avenue East.	Harry F. Paar	250	288.0	1,250

List of broadcasting stations, alphabetically by call signal—Continued

Call signal	Location of station	Owner of station	Power (watts)	Wave length	Frequency (kilocycles)
KWEA	Shreveport, La., 1513 Laurel Street.	William E. Antony.....	250	212.6	1,410
KWG	Stockton, Calif., 902 Commercial & Savings Bank Building.	Portable Wireless Telephone Co..	50	344.6	870
KWJJ	Portland, Oreg.	Wilbur Jerman.....	50	228.9	1,310
KWK	St. Louis, Mo., 4965 Lindell Boulevard.	Greater St. Louis Broadcasting Corporation.	{ 1,000 } { 2,000 }	234.2	1,280
KWKC	Kansas City, Mo., Thirty-ninth and Main Streets.	Wilson Duncan Broadcasting Co..	100	222.1	1,350
KWKH	Kennonwood, La., Spring and Fanning Streets.	W. K. Henderson Iron Works & Supply Co.	1,000	394.5	760
KWLO	Decorah, Iowa.....	Luther College (Norwegian Lutheran College).	50	247.8	1,210
KWSC	Pullman, Wash.	State College of Washington.	500	391.5	760
KWTC	Santa Ana, Calif., 1101 North Ross Street.	Dr. John W. Hancock.....	100	222.1	1,350
KWUC	Le Mars, Iowa.....	Western Union College.....	1,500	243.8	1,230
KWWG	Brownsville, Tex.	Chamber of Commerce (city of Brownsville).	500	277.6	1,080
KXA	Seattle Wash., 1520 Westlake Avenue.	American Radio Telephone Co....	500	348.6	860
KXL	Portland, Oreg., 130 Sixth Street.	K X L Broadcasters.....	50	220.4	1,360
KXRO	Aberdeen, Wash., Finch Building, Heron and South Heron Streets.	K X R O (Inc.).....	50	227.1	1,320
KYA	San Francisco, Calif., Clift Hotel.	Pacific Broadcasting Corporation..	500	309.1	970
KYW	Chicago, Ill., 700 Braddock Avenue.	Westinghouse Electric & Manufacturing Co.	{ 2,500 } { 5,000 }	526.0	570
KZIB	Manila, P. I., 20 Plaza Moraga.	I. Beck (Inc.).....	20	249.9	1,200
KZKZ	Manila, P. I., 109 Plaza Moraga.	Electrical Supply Co.....	100	270.1	1,110
KZM	Oakland, Calif., Hotel Oakland.	Preston D. Allen.....	100	245.8	1,220
KZRQ	Manila, P. I., Manila Hotel.....	Far Eastern Radio (Inc.).....	500	399.8	760
NAA	Arlington, Va.	U. S. Navy.....	1,000	434.5	690
WAAD	Cincinnati, Ohio.....	Ohio Mechanics Institute.....	25	230.6	1,300
WAAF	Chicago, Ill., 836 Exchange Avenue.	Drovers Journal Publishing Co..	500	389.4	770
WAAM	Newark, N. J., 1 Bond Street.	W A A M (Inc.).....	250	267.7	1,120
WAAT	Jersey City, N. J., 91 Sip Avenue.	Bremer Broadcasting Corporation.	300	245.8	1,220
WAAW	Omaha, Nebr., Grain Exchange Building.	Omaha Grain Exchange.....	500	440.9	680
WABC	Richmond Hill, N. Y., 113 West Fifth-seventh Street, New York City.	Atlantic Broadcasting Corporation.	{ 2,500 } { 5,000 }	309.1	970
WABF	Kingston, Pa. (Pringleboro).....	Markle Broadcasting Corporation.	250	265.4	1,460
WABI	Bangor, Me.	First Universalist Church.....	100	389.4	770
WABO	Rochester, N. Y.	Lake Avenue Baptist Church and Society.	{ 1,250 } { 500 }	254.1	1,180
WABW	Wooster, Ohio.	College of Wooster.....	50	247.8	1,210
WABY	Philadelphia, Pa., 930 South Eighth Street.	John Magaldi, jr.....	50	247.8	1,210
WABZ	New Orleans, La.	Coliseum Place Baptist Church.	50	238.0	1,260
WADC	Akron, Ohio.	Allen Theater (Allen T. Simmons).	1,000	238.0	1,260
WAFD	Detroit, Mich., Charlotte Street and Woodward Avenue.	Albert B. Parfet Co.....	100	230.6	1,300
WAGM	Royal Oak, Mich., 726 Kayser Street.	Robert L. Miller.....	50	225.4	1,330
WAIT	Taunton, Mass., 32 Weir Street.	A. H. Waite & Co.....	10	214.2	1,400
WAIU	Columbus, Ohio.	American Insurance Union.....	5,000	282.8	1,060
WAIZ	Appleton, Wis.	Irving Zuelke (Inc.).....	100	227.1	1,320
WALK	Willow Grove, Pa.	Albert A. Walker.....	50	201.2	1,490
WAMD	Minneapolis, Minn., Hotel Radisson.	Radisson Radio Corporation and Stanley E. Hubbard.	500	222.1	1,350
WAPI	Auburn, Ala.	Alabama Polytechnic Institute....	1,000	340.7	880
WASH	Grand Rapids, Mich.	Barter Laundries (Inc.).....	250	256.3	1,170
WATT	Boston, Mass. (portable), 39 Boylston Street.	Edison Electric Illuminating Co. of Boston.	100	201.2	1,490
WBAA	West Lafayette, Ind.	Purdue University.....	500	272.6	1,100
WBAK	Harrisburg, Pa.	Pennsylvania State Police.....	7,500	299.8	1,000
WBAL	Glen Morris, Md. (near Baltimore, Md.).	Consolidated Gas, Electric Light & Power Co.	5,000	285.5	1,050
WBAO	Decatur, Ill.	James Millikin University.....	100	267.7	1,120
WBAP	Fort Worth, Tex., 400 West Seventh Street.	Carter Publications (Inc.).....	5,000	499.7	600
WBAW	Nashville, Tenn., Eighth Avenue, South and Broad Streets.	Waldrum Drug Co.....	500	239.9	1,250

* Night.

* Day.

* 6 a. m. to 10 p. m.

* After 10 p. m.

* Day only.

List of broadcasting stations, alphabetically by call signal—Continued

Call signal	Location of station	Owner of station	Power (watts)	Wave length	Frequency (kilocycles)
WBAX	Wilkes-Barre, Pa., 66 Gildersleeve Street.	John H. Stenger, jr.	100	249.9	1,200
WBBC	Brooklyn, N. Y., 2123 Troy Avenue.	Brooklyn Broadcasting Corporation.	500	227.1	1,320
WBBL	Richmond, Va.	Grace Covenant Presbyterian Church.	100	234.2	1,280
WBBM	Glenview, Ill., 1554 Howard Street.	Atlas Investment Co.	5,000	389.4	770
WBBP	Petoskey, Mich.	Petoskey High School.	100	239.9	1,250
WBBR	Rossville, N. Y., 124 Columbia Heights, Brooklyn, N. Y.	Peoples Pulpit Association.	1,000	256.3	1,170
WBBW	Norfolk, Va.	Ruffner Junior High School.	100	236.1	1,270
WBBY	Charleston, S. C.	Washington Light Infantry.	75	249.9	1,200
WBBZ	Chicago, Ill. (portable), 36 South State Street.	C. L. Carrell.	100	204.0	1,470
WBCN	Chicago, Ill., 728 West Sixty-fifth Street.	Great Lakes Broadcasting Co.	250	288.3	1,040
WBES	Tacoma Park, Md.	Bliss Electrical School.	100	265.3	1,130
WBET	Boston, Mass., 324 Washington Street.	Boston Transcript Co.	500	288.3	1,040
WBIS	Boston, Mass., 1 Winter Place.	Shepard Stores.	500	461.3	650
WBKN	Brooklyn, N. Y., 350 Stone Avenue.	Arthur Fiske.	100	199.9	1,500
WBMH	Detroit, Mich., 13214 East Jefferson Street.	Braun's Music House.	100	211.1	1,420
WBMS	Union City, N. J., 964 Bergenline Avenue.	WBMS Broadcasting Corporation.	100	199.9	1,500
WBNY	New York, N. Y., 400 East One hundred and thirty-ninth Street.	Baruchrome Corporation.	500	236.1	1,270
WBOQ	Richmond Hill, N. Y., 113 West Fifty-seventh Street, New York City.	Atlantic Broadcasting Corporation.	500	309.1	970
WBRC	Birmingham, Ala., 1913 Fifth Avenue.	Birmingham Broadcasting Co.	250	241.8	1,240
WBRE	Wilkes-Barre, Pa., 16 North Main Street.	Louis G. Baltimore.	100	249.9	1,200
WBRL	Tilton, N. H., 23 Summer Street.	Booth Radio Laboratories.	500	232.4	1,290
WBRS	Cliffside, N. J., 434 Lafayette Street, Brooklyn, N. Y.	Italian Educational Broadcast Co.	250	211.1	1,420
WBSO	Wellesley Hills, Mass., Babson Park, Mass.	Babson's Statistical Organization.	100	384.4	780
WBT	Charlotte, N. C.	C. C. Coddington.	{ 750 1,000	} 258.5	} 1,160
WBZ	Springfield, Mass.	Westinghouse Electric & Manufacturing Co.	15,000		
WBZA	Boston, Mass., Hotel Statler.	do.	500	333.1	900
WCAO	Mansfield, Conn.	Connecticut Agricultural College.	500	535.4	560
WCAD	Canton, N. Y.	St. Lawrence University.	{ 500 1,000	} 243.8	} 1,230
WCAE	Pittsburgh, Pa., Sixth and Smithfield Streets.	Kaufmann & Baer Co.	500		
WCAH	Columbus, Ohio, 321 West Tenth Avenue.	Entrekin Electric Co.	250	234.2	1,280
WCAJ	Lincoln, Nebr. (University Place).	Nebraska Wesleyan University.	500	379.5	790
WCAL	Northfield, Minn.	St. Olaf College.	500	285.5	1,050
WCAM	Camden, N. J.	City of Camden.	500	223.7	1,340
WCAO	Baltimore, Md., 844 North Howard Street.	Monumental Radio (Inc.)	250	243.8	1,230
WCAP	Asbury Park, N. J., Isolation Hospital.	Radio Industries Broadcast Co.	500	239.9	1,250
WCAT	Rapid City, S. Dak.	South Dakota State School of Mines.	100	247.8	1,210
WCAU	Philadelphia, Pa., Hotel Pennsylvania.	Universal Broadcasting Co.	500	260.7	1,150
WCAZ	Burlington, Vt.	University of Vermont.	100	254.1	1,180
WCAZ	Carthage, Ill.	Carthage College.	50	249.9	1,200
WCBA	Allentown, Pa., 1015 Allen Street.	Charles W. Heimbach and E. Bryan Musselman.	100	222.1	1,350
WCBD	Zion, Ill.	Wilbur G. Voliva.	5,000	344.6	870
WCBE	New Orleans, La., Hotel De Soto.	Uhalt Radio.	5	227.1	1,320
WCBM	Baltimore, Md., Charles Street and North Avenue.	Hotel Chateau.	100	225.4	1,330
WCBR	Providence, R. I. (portable), 42 Doyle Avenue.	Charles H. Messter.	100	201.2	1,490

² Night.

³ Day.

List of broadcasting stations, alphabetically by call signal—Continued

Call signal	Location of station	Owner of station	Power (watts)	Wave length	Frequency (kilocycles)
WCBS	Springfield, Ill., St. Nicholas Hotel.	Harold L. Dewing and Charles H. Messter.	250	209.7	1,430
WCCO	{ St. Paul-Minneapolis, Minn. (Anoka).	} Washburn-Crosby Co.-----	{ ² 5,000 ³ 7,500	} 405.2	} 740
WCDA	Cliffside, N. J., (434 Lafayette Street, Brooklyn, N. Y.)				
WCFL	Chicago, Ill., 623 South Wabash Avenue.	Chicago Federation of Labor.....	1,500	483.6	620
WCGU	Coney Island, N. Y. (Sea Gate), 183 Vermont Street.	Charles G. Unger.....	500	218.8	1,370
WCLO	Kenosha, Wis.	C. E. Whitmore.....	100	227.1	1,320
WCLS	Joliet, Ill., 301 East Jefferson Street.	The M. A. Felman Co.-----	150	215.7	1,390
WCMA	Culver, Ind.	Culver Military Academy.....	500	260.7	1,150
WCOA	Pensacola, Fla.	City of Pensacola.....	500	249.9	1,200
WCOC	Columbus, Miss., Fifth Street and Ninth Avenue South.	Crystal Oil Co.-----	250	230.6	1,300
WCOT	Providence, R. I., 1849 Westminster Street.	Jacob Conn.....	100	225.4	1,330
WCRW	Chicago, Ill., 2756 Pine Grove Avenue.	Clinton R. White.....	500	223.7	1,340
WC8H	Portland, Me.	Congress Square Hotel Co.-----	500	365.6	820
WC8O	Springfield, Ohio	Wittenberg College.....	500	256.3	1,170
WCWK	Fort Wayne, Ind., 1729 Lafayette Street.	Chester W. Keen.....	250	214.2	1,400
WCWS	Danbury, Conn., 198 Main Street.	Danbury Broadcasting Station....	100	265.3	1,130
WCX	Pontiac, Mich.	WJR (Inc.) and the Detroit Free Press.	5,000	440.9	680
WDAD	Nashville, Tenn., 171 Eighth Avenue North.	Dad's Auto Accessories (Inc.) and Life and Casualty Insurance Co.	1,000	225.4	1,330
WDAE	Tampa, Fla.	Tampa Daily Times.....	500	267.7	1,120
WDAF	Kansas City, Mo.	Kansas City Star.....	1,000	370.2	810
WDAG	Amarillo, Tex., 605 East Fourth Street.	J. Laurance Martin.....	250	263.0	1,140
WDAH	El Paso, Tex.	Trinity Methodist Church, South.	100	234.2	1,280
WDAY	Fargo, N. Dak., 119 Broadway.	Radio Equipment Corporation....	{ ² 250 ³ 500	} 545.1	} 550
WDBJ	Roanoke, Va., 106 Church Avenue Southwest.	Richardson-Wayland Electrical Corporation.	250		
WDBO	{ Orlando, Fla., Winter Park, Fla.	} Rollins College.....	{ ² 500 ³ 1,000	} 268.3	} 1,040
WDEL	Wilmington, Del., 405 Delaware Avenue.				
WDGY	Minneapolis, Minn., Superior Boulevard at Falvey Crossroad.	George W. Young.....	500	285.5	1,060
WDOD	Chattanooga, Tenn., 615 Market Street.	Chattanooga Radio Co.....	500	243.8	1,230
WDRC	New Haven, Conn., 5 Beacon Avenue.	Doolittle Radio Corporation.....	500	282.8	1,060
WDWF	Cranston, R. I.	Dutee W. Flint and The Lincoln Studios.	250	260.7	1,150
WDZ	Tuscola, Ill., Star Store Building	James L. Bush.....	100	277.6	1,080
WEAF	New York, N. Y., 195 Broadway	National Broadcasting Co.	5,000	491.5	610
WEAM	North Plainfield, N. J.	Borough of North Plainfield.....	250	263.0	1,140
WEAN	Providence, R. I.	Shepard Co.....	500	275.1	1,090
WEAO	Columbus, Ohio	Ohio State University.....	750	282.8	1,060
WEAR	Cleveland, Ohio	Willard Storage Battery Co.....	1,000	390.8	750
WEBC	{ Superior, Wis., 1225 Tower Street.	} Head of the Lakes Broadcasting Co.	{ ² 250 ³ 1,000	} 241.8	} 1,240
WEBE	Cambridge, Ohio, 319 Wall Street.				
WEBH	Chicago, Ill., 5525 Sheridan Road.	Edgewater Beach Hotel Co.....	500	365.6	820
WEBJ	New York, N. Y., 2396 Third Avenue.	Third Avenue Ry. Co.....	500	256.3	1,170
WEBQ	Harrisburg, Ill.	Tate Radio Co.....	15	223.7	1,340
WEBR	Buffalo, N. Y., Bramson Building.	H. H. Howell Broadcasting Co....	200	241.8	1,240
WEBW	Beloit, Wis.	Beloit College.....	500	258.5	1,160
WEDC	Chicago, Ill., 3860 Ogden Avenue.	Emil Denmark.....	500	241.8	1,240
WEEL	Boston, Mass., 39 Boylston Street.	Edison Electric Illuminating Co. of Boston.	500	508.2	590
WEHS	Evanston, Ill., 1318 Elmwood Avenue.	Victor C. Carlson.....	100	508.2	1,390
WEMC	Berrien Springs, Mich.	Emmanuel Missionary College....	1,000	483.6	620

² Night.

³ Day.

List of broadcasting stations, alphabetically by call signal—Continued

Call signal	Location of station	Owner of station	Power (watts)	Wave length	Pre- quency (kilo- cycles)
WENR	Chicago, Ill., 310 South Michigan Avenue.	Great Lakes Radio Broadcasting Co.	500	288.3	1,040
WEPS	Gloucester, Mass., 209 Main Street.	Matheson Radio Co. (Inc.)	100	296.9	1,010
WEVD	Woodhaven, N. Y., 9024 Seventy-eighth Street.	Debs Memorial Radio Fund	500	245.8	1,220
WEW	St. Louis, Mo.	St. Louis University	1,000	352.7	850
WFAA	Dallas, Tex.	Dallas Morning News	500	545.1	550
WFAM	St. Cloud, Minn.	Times Publishing Co.	10	252.0	1,190
WFAN	Philadelphia, Pa., Hotel Lorraine.	Keystone Broadcasting Co. (Haverford College Radio Club).	500	223.7	1,340
WFBC	Knoxville, Tenn.	First Baptist Church	50	234.2	1,280
WFBE	Cincinnati, Ohio.	Garfield Place Hotel	250	245.8	1,220
WFBG	Altoona, Pa.	William F. Gable Co.	100	267.7	1,120
WFBJ	Collegeville, Minn.	St. John's University	100	272.6	1,100
WFBL	Syracuse, N. Y., Jefferson and Warren Streets.	The Onondaga Co.	750	268.5	1,180
WFBM	Indianapolis, Ind., 48 Monument Circle.	Indianapolis Power & Light Co.	1,000	275.1	1,090
WFBR	Baltimore, Md., Hoffman and Bolton Streets.	Baltimore Radio Show (Inc.)	{ 250 500 }	243.8	1,230
WFBZ	Galesburg, Ill.	Knox College	50	247.8	1,210
WFCL	Pawtucket, R. I., 103 Exchange Street.	Frank Crook (Inc.)	100	241.8	1,240
WFDT	Flint, Mich., Police Building.	Frank D. Fallain	100	272.6	1,100
WFI	Philadelphia, Pa.	Strawbridge & Clothier	500	405.2	740
WFIW	Hopkinsville, Ky.	Acme Mills (Inc.)	{ 750 1,000 }	260.7	1,150
WFJC	Akron, Ohio.	W. F. Jones Broadcasting (Inc.)	500	227.1	1,320
WFKB	Chicago, Ill., 4536 Woodlawn Avenue.	Francis K. Bridgman (Inc.)	500	223.7	1,340
WFKD	Philadelphia, Pa., 1510 Oxford Street (Frankford).	Foulkrod Radio Engineering Co.	50	247.8	1,210
WFLA	Clearwater, Fla., South Osceola Street, City Park.	Clearwater Chamber of Commerce and St. Petersburg Chamber of Commerce.	750	516.9	580
WGAL	Lancaster, Pa., 23 East Orange Street.	Lancaster Electric Supply & Construction Co.	15	252.0	1,190
WGBB	Freeport, N. Y., 217 Bedell Street.	Harry H. Carman	400	245.8	1,220
WGBC	Memphis, Tenn.	First Baptist Church	15	228.9	1,310
WGBF	Evansville, Ind., 307 South Seventh Street.	Finke Furniture Co.	250	236.1	1,270
WGBI	Scranton, Pa., 318 Linden Street	Scranton Broadcasters, (Inc.)	250	230.6	1,300
WGBS	Astoria, N. Y., Thirty-third Street and Sixth Avenue, New York City.	Gimbel Bros.	500	348.6	860
WGOP	Newark, N. J., 594 Broad Street.	May Radio Broadcast Corporation.	250	267.7	1,120
WGES	Chicago, Ill., 128 North Crawford Avenue.	Oak Leaves Broadcasting Corporation.	500	241.8	1,240
WGHP	Mount Clemens, Mich., (2761 Jefferson Avenue, Detroit, Mich.).	George H. Phelps (Inc.)	750	277.6	1,080
WGL	Secaucus, N. J., Hotel Majestic.	International Broadcasting Corporation.	1,000	293.9	1,020
WGM	Jeanette, Pa., 501 Cowan Avenue.	Verne & Elton Spencer	50	208.2	1,440
WGMS*	St. Paul-Minneapolis, Minn.	Washburn-Crosby Co.	500	245.8	1,220
WGMU	Richmond Hill, N. Y. (portable) 113 West Fifty-seventh Street, New York City.	Atlantic Broadcasting Co.	100	201.2	1,490
WGN	Chicago, Ill., 435 North Michigan Avenue.	The Tribune Co. and Liberty Weekly (Int.).	500	416.4	720
WGOP	Flushing, N. Y., 55 North Fifteenth Street.	Frederick B. Zittel, jr.	100	199.9	1,500
WGR	Buffalo, N. Y., Statler Hotel.	Federal Radio Corporation	750	302.8	990
WGST	Atlanta, Ga.	Georgia School of Technology	500	270.1	1,110
WGWB	Milwaukee, Wis., 144 Broadway.	Radiocast Corporation of Wis.	500	218.8	1,370
WGY	Schenectady, N. Y.	General Electric Co.	50,000	379.5	790
WHA	Madison, Wis.	University of Wisconsin	750	333.1	900
WHAD	Milwaukee, Wis.	Marquette University	500	270.1	1,110
WHAM	Victor Township, N. Y.	Stromberg-Carlson Telephone Manufacturing Co.	5,000	280.2	1,070
WHAP	Carlstadt, N. J., Washington Avenue.	Defenders of Truth Society (Inc.)	1,000	236.1	1,270
WHAS	Louisville, Ky.	Courier-Journal and Louisville Times.	500	322.4	930

* Night.

* Day.

* This call assigned for use of Washburn-Crosby Co. when transmitting through WLB.

List of broadcasting stations, alphabetically by call signal—Continued

Call signal	Location of station	Owner of station	Power (watts)	Wave length	Frequency (kilo-cycles)
WHAZ	Troy, N. Y.	Rensselaer Polytechnic Institute	500	305.9	980
WHB	Kansas City, Mo., Sweeney Building.	Sweeney School Co.	500	340.7	880
WHBA	Oil City, Pa.	C. C. Shaffer	10	260.7	1,150
WHBC	Canton, Ohio	St. John's Catholic Church	10	236.1	1,270
WHBD	Bellefontaine, Ohio	Chamber of Commerce	100	222.1	1,350
WHBF	Rock Island, Ill., 217 Eighteenth Street.	Beardsley Specialty Co.	100	222.1	1,350
WHBL	Chicago, Ill. (portable) 36 South State Street.	C. L. Carrell	100	204.0	1,470
WHBM	do.	do.	100	201.2	1,490
WHBP	Johnstown, Pa., 101 Main Street.	Johnstown Automobile Co.	$\left. \begin{array}{l} 2,500 \\ 3,250 \end{array} \right\}$	228.9	1,310
WHBQ	Memphis, Tenn., Dermon Building.	Broadcasting Station WHBQ (Inc.)	100	232.4	1,290
WHBU	Anderson, Ind.	Citizens Bank	15	220.4	1,360
WHBW	Philadelphia, Pa., 4916 Chestnut Street.	D. R. Kienzie	100	220.4	1,360
WHBY	West De Pere, Wis.	St. Norbert's College	50	249.9	1,200
WHDI	Minneapolis, Minn., 818 Superior Boulevard.	William Hood Dunwoody Industrial Institute.	500	245.8	1,220
WHEC	Rochester, N. Y., 36 South Avenue.	Hickson Electric Co.	$\left. \begin{array}{l} 2,500 \\ 3,250 \end{array} \right\}$	254.1	1,180
WHFC	Chicago, Ill., Hotel Flanders	Goodson & Wilson (Inc.)	200	215.7	1,390
WHK	Cleveland, Ohio, corner Ontario and St. Clair Avenues.	Radio Air Service Corporation	$\left. \begin{array}{l} 2,500 \\ 3,000 \end{array} \right\}$	265.3	1,130
WHN	New York, N. Y., 1540 Broadway.	George Schubel	500	394.5	760
WHO	Des Moines, Iowa	Bankers Life Co.	5,000	535.4	560
WHPP	Englewood Cliffs, N. J., Sylvan and Hollywood Avenues.	Bronx Broadcasting Co.	10	206.8	1,450
WHT	Deerfield, Ill. (410 North Michigan Boulevard, Chicago, Ill.)	Radiophone Broadcasting Corporation.	5,000	305.9	980
WIAD	Philadelphia, Pa., 6318 North Park Avenue.	Howard R. Miller	100	288.3	1,040
WIAS	Ottumwa, Iowa, 107 East Second Street.	Poling Electric Co.	100	322.4	930
WIBA	Madison, Wis., 16 East Mifflin Street.	Capital Times Co. and Strand Theater Corporation.	100	239.9	1,250
WIBG	Elkins Park, Pa.	St. Paul's Protestant Episcopal Church.	50	440.9	680
WIBJ	Chicago, Ill. (portable), 36 South State Street.	C. L. Carrell	100	201.2	1,490
WIBM	do.	do.	100	201.2	1,490
WIBO	Desplaines, Ill.	WIBO Broadcasters (Inc.)	5,000	305.9	980
WIBR	Steubenville, Ohio	Thurman A. Owings	50	249.9	1,200
WIBS	Elizabeth, N. J., 80 Broad Street.	New Jersey Broadcasting Corporation.	250	204.0	1,470
WIBU	Poynette, Wis.	Wisconsin State Journal	20	217.3	1,380
WIBW	Topeka, Kans., Tenth and Kansas Streets.	C. L. Carrell	250	204.0	1,470
WIBX	Utica, N. Y., 102 Lafayette Street.	WIBX (Inc.)	$\left. \begin{array}{l} 2,150 \\ 3,000 \end{array} \right\}$	238	1,260
WIBZ	Montgomery, Ala., 217 Catoma Street.	Alexander D. Trum	15	230.6	1,300
WICC	Easton, Conn., Sport Hill	Bridgeport Broadcasting Station (Inc.)	500	265.3	1,130
WIL	St. Louis, Mo., 1010 Locust Street.	Benson Radio Broadcasting Co.	250	258.5	1,160
WIOD	Miami Beach, Fla.	Carl G. Fisher Co.	1,000	247.8	1,210
WIP	Philadelphia, Pa., Market and Ninth Streets.	Gimbel Bros.	500	248.6	860
WISN	Milwaukee, Wis., 467 Jackson Street.	School of Engineering of Milwaukee.	250	270.1	1,110
WIVA	Norfolk, Va., 305 Plume Street.	Radio Corporation of Virginia	100	209.7	1,430
WJAD	Waco, Tex., Hotel Raleigh	Frank P. Jackson	500	333.1	900
WJAG	Norfolk, Nebr.	Norfolk Daily News	$\left. \begin{array}{l} 2,250 \\ 3,500 \end{array} \right\}$	285.5	1,050
WJAK	Kokomo, Ind.	Kokomo Tribune	50	234.2	1,280
WJAM	Cedar Rapids, Iowa, 322 Third Avenue, West.	D. M. Perham	250	239.9	1,250
WJAR	Providence, R. I.	The Outlet Co.	500	483.6	620
WJAS	Pittsburgh, Pa., Tenth and Penn Avenue.	Pittsburgh Radio Supply House.	500	270.1	1,110
WJAX	Jacksonville, Fla.	City of Jacksonville	1,000	340.7	880
WJAY	Cleveland, Ohio, Hotel Hollenden.	Cleveland Radio Broadcasting Corporation.	500	227.1	1,320
WJAZ	Mount Prospect, Ill. (3620 Iron Street., Chicago, Ill.)	Zenith Radio Corporation.	5,000	263.0	1,140

1 Night.

1 Day.

List of broadcasting stations, alphabetically by call signal—Continued

Call signal	Location of station	Owner of station	Power (watts)	Wave length	Frequency (kilo-cycles)
WJBA	Joliet, Ill., 301 Whitley Avenue.	D. H. Lentz, jr.	50	247.8	1,210
WJBB	Sarasota, Fla.	Financial Journal	250	238.0	1,260
WJBC	La Salle, Ill., Second and Joliet Streets.	Hummer Furniture Co.	100	227.1	1,320
WJBI	Red Bank, N. J., 63 Broad Street.	Robert S. Johnson	250	263.0	1,14
WJBK	Ypsilanti, Mich., 803 Congress Street.	Ernest F. Goodwin	15	220.4	1,360
WJBL	Decatur, Ill., 301 North Water Street.	William Gushard Dry Goods Co.	250	212.6	1,410
WJBO	New Orleans, La., 119 South St. Patrick Street.	Valdemar Jensen	100	263.0	1,140
WJBT	Chicago, Ill., 1554 Howard Street.	John S. Boyd (Inc.)	500	389.4	770
WJBU	Lewisburg, Pa.	Bucknell University	100	214.2	1,400
WJBW	New Orleans, La., 2743 Dumaine Street.	Charles C. Carlson, jr.	30	238.0	1,280
WJBY	Gadsden, Ala., 517 Broad Street.	Electric Construction Co.	50	234.2	1,280
WJBZ	Chicago Heights, Ill., 1701 Halstead Street.	Roland G. Pamler and Anthony Coppotelli	100	208.2	1,440
WJJD	Mooseheart, Ill.	Supreme Lodge of the World, Loyal Order of Moose.	1,000	365.6	820
WJKS	Gary (Inc.), 540 Lake Street.	Johnson Kennedy Radio Corporation.	500	232.4	1,290
WJPW	Ashtabula, Ohio, 192 Prospect Street.	J. P. Wilson	30	203.2	1,440
WJR	Pontiac, Mich.	WJR (Inc.) and the Detroit Free Press.	5,000	440.9	680
WJZ	Bound Brook, N. J., 33 West Forty-second Street.	Radio Corporation of America	30,000	454.3	660
WKAQ	San Juan, P. R., Telephone Building.	Radio Corporation of Porto Rico	500	322.4	930
WKAR	East Lansing, Mich.	Michigan State College	{ ² 500 ¹ 1,000}	277.6	1,080
WKAV	Laconia, N. H.	Laconia Radio Club	50	223.7	1,340
WKBB	Joliet, Ill., 613 Jefferson Street.	Sanders Bros.	150	215.7	1,390
WKBC	Birmingham, Ala., 1428 North Twelfth Avenue.	H. L. Ansley	10	218.8	1,370
WKBE	Webster, Mass., 59 Emerald Avenue.	K. & B. Electric Co.	100	228.9	1,310
WKBF	Indianapolis, Ind., 902 North Meridian Street.	Noble B. Watson	250	252.0	1,190
WKBG	Chicago, Ill. (portable), 36 South State Street.	C. L. Carrell	100	201.2	1,490
WKBH	La Crosse, Wis., 221 Main Street.	Callaway Music Co.	500	220.4	1,360
WKBI	Chicago, Ill., 1917 Warner Avenue.	Fred L. Schoenwolf	50	215.7	1,390
WKBL	Monroe, Mich., 16 South Monroe Street.	Monroma Radio Manufacturing Co.	15	205.4	1,460
WKBN	Youngstown, Ohio (Young Men's Christian Association).	Radio Electric Service Co.	50	214.2	1,400
WKBO	Jersey City, N. J., 2866 Boulevard.	Camith Corporation	500	218.8	1,370
WKBP	Battle Creek, Mich.	Battle Creek Enquirer and News.	50	212.6	1,410
WKBQ	New York, N. Y., 1100 East One hundred and seventy-seventh Street.	The Standard Cahill Co. (Inc.)	500	218.8	1,370
WKBS	Galesburg, Ill., 227 Duffield Avenue.	Permil N. Nelson	100	217.3	1,380
WKBT	New Orleans, La.	First Baptist Church	50	252.0	1,190
WKBV	Brookville, Ind., 658 Main Street.	Knox Battery & Electric Co.	100	217.3	1,380
WKBW	Buffalo, N. Y., 1428 Main Street	{Churchill Evangelistic Association Karl L. Ashbacher	{ ² 500 ³ 750}	{217.3 199.9}	{1,380 1,500}
WKBZ	Ludington, Mich., First National Bank Building.		15	199.9	1,500
WKEN	Amherst, N. Y.	WKEN (Inc.)	750	204.0	1,470
WKDR	Kenosha, Wis., 936 North Michigan Avenue, Chicago, Ill.	Edward A. Dato	15	247.8	1,210
WKJO	Lancaster, Pa., 16 West King Street.	Kirk Johnson & Co.	50	252.0	1,190
WKRC	Cincinnati, Ohio, Hotel Alms.	Kodel Radio Corporation	500	245.8	1,220
WKY	Oklahoma, Okla., Huckins Hotel.	WKY Radiophone Co.	150	288.3	1,040

¹ Night.

² Day

List of broadcasting stations, alphabetically by call signal—Continued

Call signal	Location of station	Owner of station	Power (watts)	Wave length	Frequency (kilo-cycles)
WLAC	Nashville, Tenn.....	Life and Casualty Insurance Co. and Dad's Auto Accessories (Inc.).	1,000	225.4	1,330
WLAP	{Louisville, Ky. (Virginia Avenue Baptist Church).	{L. W. Benedict.....	{ 30	267.7	1,120
WLB	{Minneapolis, Minn.....	{University of Minnesota.....	{ 100		
WLBC	Muncie, Ind., 2224 South Jefferson Street.	D. A. Burton.....	50	245.8	1,220
WLBF	Kansas City, Mo., Thirty-second and Main Streets.	Everett L. Dillard.....	50	209.7	1,430
WLBG	Petersburg, Va., 126A North Sycamore Street.	Robert A. Gamble.....	100	214.2	1,400
WLBH	Farmingdale, N. Y., Conklin Street.	Joseph J. Lombardi.....	30	232.4	1,290
WLBH	East Wenona, Ill., 107 South Chestnut Street.	Wenona Legion Broadcasters (Inc.).	250	238.0	1,260
WLBL	{Stevens Point, Wis., Hotel Whiting.	{Wisconsin Department of Markets.	{ 1,000	333.1	900
WLBM	{Boston, Mass., 353 Washington Street.				
WLBN	Chicago, Ill. (portable, La Prairie, Ill.).	William E. Hilier.....	50	204.0	1,470
WLBO	Galesburg, Ill., 526 Monmouth Boulevard.	Frederick A. Trebbe, jr.....	100	217.3	1,380
WLBQ	Atwood, Ill.....	E. Dale Trout.....	25	218.8	1,370
WLBW	Belvidere, Ill.....	Alford Radio Co.....	15	322.4	930
WLBW	Crown Point, Ind., 317 East North Street.	Harold Wendell.....	50	247.8	1,210
WLBV	Mansfield, Ohio, Third and Diamond Streets.	Mansfield Broadcasting Association.	50	206.8	1,450
WLBW	Oil City, Pa., 1 Sycamore Street.	Petroleum Telephone Co.....	500	293.9	1,020
WLBX	Long Island City, N. Y., 283 Crescent Street.	John N. Brahy.....	250	204.0	1,470
WLBZ	Iron Mountain, Mich., 1236 Carpenter Street.	Aimone Electric.....	50	209.7	1,430
WLBZ	Dover-Foxcroft, Me.....	Thompson L. Guernsey.....	250	208.2	1,440
WLCI	Ithaca, N. Y.....	Lutheran Association of Ithaca, N. Y.	50	247.8	1,210
WLEX	Lexington, Mass., Adams Street	The Lexington Air Station	50	216.7	1,390
WLBI	Elgin, Ill. (near).....	Liberty Weekly (Inc.) and the Tribune Co.	15,000	416.4	720
WLIT	Philadelphia, Pa., Eighth and Market Streets.	Lit Bros.....	500	406.2	740
WLOE	Chelsea, Mass., 56 Washington Avenue.	William S. Pota.....	100	211.1	1,420
WLS	Crete, Ill. (Hotel Sherman, Chicago, Ill.).	Sears, Roebuck & Co.....	5,000	344.6	870
WLSI	Cranston, R. I. (335 Westminister Street, Providence, R. I.).	Lincoln Studios (Inc.) and Dutee W. Flint.	250	260.7	1,150
WLTH	Brooklyn, N. Y., 635 Fulton Street.	Voice of Brooklyn (Inc.).....	250	256.3	1,170
WLTS	Chicago, Ill.....	Lane Technical High School.....	100	483.6	620
WLW	Harrison, Ohio, 3401 Colerain Avenue.	Crosley Radio Corporation.....	5,000	428.3	700
WLWL	Kearny, N. J. (415 West Fiftyninth Street, New York, N. Y.).	Missionary Society of St. Paul the Apostle.	5,000	370.2	810
WMAC	Cazenovia, N. Y., Fernwood Street.	Clive B. Meredith.....	500	225.4	1,330
WMAF	Dartmouth, Mass.....	Round Hills Radio Corporation.....	500	428.3	700
WMAK	Tonawanda, N. Y.....	WMAK Broadcast Station.....	750	545.1	550
WMAL	Washington, D. C., 720 Eleventh Street.	M. A. Leese Co.....	500	241.8	1,240
WMAN	Columbus, Ohio, 583 East Broad Street.	W. E. Heskett.....	50	234.2	1,280
WMAQ	Chicago, Ill.....	Chicago Daily News Co.....	1,000	447.5	670
WMAZ	St. Louis, Mo.....	Kingshighway Presbyterian Church.	100	234.2	1,280
WMAZ	Macon, Ga.....	Mercer University.....	500	270.1	1,110
WMBA	Newport, R. I. (portable), 13 Robinson Street.	Le Roy J. Beebe.....	100	204.0	1,470
WMBB	Homewood, Ill., (near).....	American Bond & Mortgage Co.....	5,000	252.0	1,190
WMBC	Detroit, Mich., Hotel Savoy.....	Michigan Broadcasting Co.....	100	243.8	1,230
WMBD	Peoria Heights, Ill., 107 East Glen Avenue.	Peoria Heights Radio Laboratory.	250	206.4	1,460
WMBE	St. Paul, Minn., 2018 Grand Avenue.	C. S. Stevens.....	10	208.2	1,440
WMBF	Miami Beach, Fla.....	Fleetwood Hotel Corporation.....	500	384.4	780

¹ Night.

³ Day.

List of broadcasting stations, alphabetically by call signal—Continued

Call signal	Location of station	Owner of station	Power (watts)	Wave length	Frequency (kilocycles)
WMBG	Richmond, Va., 914 West Broad Street.	Havens & Martin.....	15	220.4	1,360
WMBH	Joplin, Mo.	Edwin D. Aber.....	100	204.0	1,470
WMBI	Chicago, Ill., 153 Institute Place.	Moody Bible, Institute of.....	2,500	263.0	1,140
WMBJ	Monessen, Pa.	Star Theatre (William R. McShaffrey).	50	232.4	1,290
WMBL	Lakeland, Fla., 121 North Kentucky Avenue.	Benford Radio Studios.....	100	228.9	1,310
WMBM	Memphis, Tenn.	Seventh Day Adventist Church.....	10	209.7	1,430
WMBO	Auburn, N. Y., 95 Auburn Street.	Radio Service Laboratories.....	100	220.4	1,360
WMBQ	Brooklyn, N. Y., 95 Leonard Street.	Paul J. Gollhofer.....	100	204.0	1,470
WMBR	Tampa, Fla., 109 Franklin Street.	F. J. Reynolds.....	100	252.0	1,190
WMBS	Lemoyns, Pa., Fort Washington Road.	Macks Battery Service.....	250	234.2	1,280
WMBW	Youngstown, Ohio, 649½ Market Street.	Youngstown Broadcasting Co.....	50	214.2	1,400
WMC	Memphis, Tenn.	Memphis Commercial Appeal.....	500	516.9	580
WMCA	Hoboken, N. J. (Hotel McAlpin, New York, N. Y.)	Hotel McAlpin (Greeley Square Hotel Co.).	500	370.2	810
WMCO	Saginaw, Mich.	Wolverine Broadcasting Co.....	250	272.6	1,100
WMES	Boston, Mass., Barristers Hall.	Massachusetts Educational Society.	50	211.1	1,420
WMPC	Lapeer, Mich.	First Methodist Protestant Church.	30	234.2	1,280
WMRJ	Jamaica, N. Y., 10 New York Boulevard.	Peter J. Prinz.....	10	206.8	1,450
WMSG	New York, N. Y., 319 West West Forty-ninth Street.	Madison Square Garden Broadcast Corporation.	500	236.1	1,270
WNAC	Boston, Mass.	Shepard Stores.....	500	461.3	650
WNAD	Norman, Okla.	University of Oklahoma.....	500	239.9	1,250
WNAL	Omaha, Nebr., 5019 Capitol Avenue.	R. J. Rockwell.....	250	258.5	1,160
WNAT	Philadelphia, Pa., 827 Spring Garden Street.	Lennig Bros. Co. (Frederick Lennig).	100	288.3	1,040
WNAX	Yankton, S. Dak.	Dakota Radio Apparatus Co. and Gurney Seed & Nursery Co.	1,000	302.8	990
WNBA	Forest Park, Ill., 810 Desplaines Avenue.	Michael T. Rafferty.....	200	208.2	1,440
WBNF	Endicott, N. Y., 117 West Main Street.	Howitt-Wood Radio Co.....	50	206.8	1,450
WNBH	New Bedford, Mass., 725 Pleasant Street.	New Bedford Broadcasting Co.....	250	247.8	1,210
WNBK	Knoxville, Tenn.	Lonsdale Baptist Church.....	50	206.8	1,450
WNBO	Washington, Pa., South Main Street.	John B. Spriggs.....	15	211.1	1,420
WNBQ	Rochester, N. Y., 192 South Goodman Street.	Gordon P. Brown.....	15	205.4	1,460
WMBR	Memphis, Tenn., 883 Poplar Avenue.	Popular Radio Shop (John Ulrich).	100	228.9	1,310
WNBW	Carbondale, Pa., 21 Salem Avenue.	Home Cut Glass & China Co.....	5	199.9	1,500
WNBX	Springfield, Vt.	First Congregational Church.....	10	241.8	1,240
WNBZ	Saranac Lake, N. Y., 107 Broadway.	Smith & Mace.....	10	232.4	1,290
WNJ	Newark, N. J., 89 Lehigh Avenue.	Herman Lubinsky.....	250	267.7	1,120
WNOX	Knoxville, Tenn., 313 Commerce Avenue.	Peoples Telephone & Telegraph Co.	1,000	265.3	1,130
WNRC	Greensboro, N. C., Jefferson Standard Bldg.	Wayne M. Nelson.....	250	223.7	1,340
WNYC	New York, N. Y.	City of New York (Department of Plant and Structures).	500	526.0	570
WOAI	San Antonio, Tex., Navarro and Oakland Streets.	Southern Equipment Co.....	5,000	499.7	600
WOAN	Lawrenceburg, Tenn.	Church of the Nazarene and Vaughan School of Music.	500	239.9	1,250
WOAX	Trenton, N. J., 600 Ingham Avenue.	Franklyn, J. Wolf.....	500	239.9	1,250
WOBR	Shelby, Ohio (portable)	Harl Smith.....	10	204.0	1,470
WOBT	Union City, Tenn., 114 South First Street.	Tittsworth's Radio & Music Shop.	15	205.4	1,460
WOBU	Charleston, W. Va., 1023 Quarrier Street.	Charleston Radio Broadcasting Co.	50	267.7	1,120
WOC	Davenport, Iowa, 1002 Brady Street.	Palmer School of Chiropractic.....	5,000	374.8	800
WOCL	Jamestown, N. Y.	A. E. Newton.....	25	223.7	1,340
WODA	Paterson, N. J., 115 Ellison Street.	O'Dea Temple of Music (Richard E. O'Dea).	1,000	293.9	1,020

¹ Day only.

List of broadcasting stations, alphabetically by call signal—Continued

Call signal	Location of station	Owner of station	Power (watts)	Wave length	Frequency (kilo-cycles)
WOI	Ames, Iowa	Iowa State College	¹ 2,500	265.3	1,130
WOK	Homewood, Ill. (32 West Randolph Street, Chicago, Ill.)	Trionon (Inc.)	² 5,000		
WOKO	Peekskill, N. Y., 800 South Street.	Harold E. Smith	250	215.7	1,390
WOKT	Rochester, N. Y., 65 Broad Street.	Titus-Ets Corporation	500	209.7	1,430
WOMT	Manitowoc, Wis.	Mikadow Theater (Francis M. Kadow).	100	222.1	1,350
WOO	Philadelphia, Pa., Thirteenth and Market Streets.	John Wanamaker	500	348.6	860
WOOD	Furnwood, Mich. (Grand Rapids, Mich.)	Walter B. Stiles, jr.	500	260.7	1,150
WOQ	Kansas City, Mo.	Unity School of Christianity	500	340.7	880
WOR	Kearny, N. J. (147 Market Street, Newark, N. J.)	L. Bamberger & Co.	3,500	422.3	710
WORD	Batavia, Ill.	Peoples Pulpit Association	5,000	252.0	1,190
WOS	Jefferson City, Mo.	Missouri State Marketing Bureau	500	422.3	710
WOW	Omaha, Nebr.	Woodmen of the World Life Insurance Association.	1,000	508.2	590
WOWO	{Fort Wayne, Ind., 213 West Main Street.	{Main Auto Supply Co.	{ ² 2,500	228.9	1,310
WPAP	Cliffside, N. J.	Palisades Amusement Park	³ 5,000		
WPCO	Chicago, Ill.	North Shore Congregational Church.	500	394.5	760
WPCH	Hoboken, N. J.	Concourse Radio Corporation	500	325.9	920
WPEP	Waukegan, Ill., 140 Hazel Court.	Maurice Mayer	250	235.7	1,390
WPG	Atlantic City, N. J.	Municipality of Atlantic City	5,000	272.6	1,100
WPRC	Harrisburg, Pa., 1740 North Fifth Street.	Wilson Printing & Radio Co.	100	209.7	1,430
WPSC	State College, Pa.	Pennsylvania State College	500	299.8	1,000
WPSW	Philadelphia, Pa., 1533 Pine Street.	Philadelphia School of Wireless Telegraphy (J. C. Van Horn).	50	206.8	1,450
WPTF	Raleigh, N. C., 8 West Hargett Street.	Durham Life Insurance Co.	500	545.1	550
WQAM	Miami, Fla., 42 Fourth Street NW.	Electrical Equipment Co.	750	384.4	780
WQAN	Scranton, Pa.	Scranton Times	250	230.6	1,300
WQAO	Cliffside, N. J. (New York, N. Y.)	Calvary Baptist Church	500	394.5	760
WQBA	Tampa, Fla.	Amore College of the United States of America.	250	288.0	1,260
WQBC	Utica, Miss.	I. R. Jones	100	215.7	1,390
WQBJ	Clarksburg, W. Va., Willow Beach Club.	John Raikes	65	289.9	1,250
WQBO	Gulfport, Miss.	Gulf Coast Music Co.	15	222.1	1,350
WQJ	Chicago, Ill., 4109 Fillmore Street.	Calumet Broadcasting Co.	500	447.5	670
WRAF	Laporte, Ind., 719 Michigan Avenue.	The Radio Club (Inc.)	100	206.2	1,440
WRAH	Providence, R. I., 191 Alabama Avenue.	Stanley N. Read	250	199.9	1,500
WRAK	Escanaba, Mich., 1105 Ludington Street.	Economy Light Co.	50	282.8	1,060
WRAM	Galesburg, Ill.	Lombard College	50	247.8	1,210
WRAW	Reading, Pa., 480 Schuylkill Avenue.	Avenue Radio & Electric Shop (Horace D. Good).	100	238.0	1,260
WRAX	Philadelphia, Pa., 1608 West Alleghany Avenue.	Berachah Church (Inc.)	250	212.6	1,410
WRBC	Valparaiso, Ind.	Immanuel Lutheran Church	250	238.0	1,260
WRC	Washington, D. C.	Radio Corporation of America	500	468.5	640
WREC	Whitehaven, Tenn. (Peabody Hotel, Memphis).	WREC (Inc.)	100	249.9	1,200
WREN	Lawrence, Kans.	Jenny Wren Co.	750	254.1	1,180
WRES	Quincy, Mass., 795 Hancock Street.	Harry L. Sawyer	50	217.3	1,380
WRHF	Washington, D. C., Hotel Annapolis.	American Broadcasting Co.	150	322.4	930
WRHM	Fridley (Minneapolis), Minn.	Rosedale Hospital	1,000	260.7	1,150
WRK	Hamilton, Ohio, 3 Railroad Street.	S. W. Doron & John C. Slade	100	205.4	1,460
WRM	Urbana, Ill.	University of Illinois	{ ³ 500	272.6	1,100
WRMU	MU-1 (yacht), 113 West Fifty-seventh Street.	Atlantic Broadcasting Co.	¹ 1,000		
WRNY	Coytesville, N. J. (Roosevelt Hotel, N. Y.)	Experimenter Publishing Co.	500	325.9	920
WRPI	Terre Haute, Ind.	Rose Polytechnic Institute	100	208.2	1,440
WRR	Dallas, Tex., Jefferson Hotel	City of Dallas	500	461.3	650

² Night.³ Day.¹ Operates through WMBB.

List of broadcasting stations, alphabetically by call signal—Continued

Call signal	Location of station	Owner of station	Power (watts)	Wave length	Frequency (kilo-cycles)
WRRS	Racine, Wis., Arcade Building	Racine Broadcasting Corporation	50	247.8	1,210
WRST	Bay Shore, N. Y., 76 Main Street	Radiotel Manufacturing Co.	250	211.1	1,420
WRUF	Gainesville, Fla.	University of Florida	5,000	202.6	1,480
WRVA	Richmond, Va., Twenty-second and Cary Streets	Larus & Bro. Co.	1,000	254.1	1,180
WSAI	Mason, Ohio	United States Playing Card Co.	5,000	361.2	830
WSAJ	Grove City, Pa.	Grove City College	250	223.7	1,340
WSAN	Allentown, Pa.	Allentown Call Publishing Co.	100	222.1	1,350
WSAR	Fall River, Mass.	Doughty & Welch Electrical Co.	250	212.6	1,410
WSAX	Chicago, Ill., 3620 Iron Street	Zenith Radio Corporation	100	204.0	1,470
WSAZ	Huntington, W. Va., 1143 Fourth Avenue	McKellar Electric Co.	100	249.9	1,200
WSB	Atlanta, Ga.	Atlanta Journal	1,000	275.9	630
WSBC	Chicago, Ill., 1219 S. Wabash Avenue	World Battery Co.	500	232.4	1,290
WSBF	St. Louis, Mo., Sixth and Washington Streets	Mississippi Valley Broadcasting Co.	250	258.5	1,160
WSBT	South Bend, Ind.	South Bend Tribune	500	399.8	750
WSDA	Brooklyn, N. Y.	The City Temple & Amateur Radio Specialty Co.	500	227.1	1,320
WSEA	Virginia Beach, Va., Cavalier Hotel	Virginia Beach Broadcasting Co.	500	263.0	1,140
WSGH	Brooklyn, N. Y., Brighton Beach	The City Temple & Amateur Radio Specialty Co.	500	227.1	1,320
WSIX	Springfield, Tenn.	638 Tire & Vulcanizing Co.	150	249.9	1,200
WSKC	Bay City, Mich.	World's Star Knitting Co.	250	272.6	1,100
WSM	Nashville, Tenn.	National Life & Accident Insurance Co.	5,000	336.9	890
WSMB	New Orleans, La., Building Maison Blanche	Saenger Theatres (Inc.) and Maison Blanche Co.	750	296.9	1,010
WSMK	Dayton, Ohio, Hotel Gibbons	Stanley M. Krohn, Jr.	200	296.9	1,010
WSPD	Toledo, Ohio, Hotel Waldorf	Toledo Broadcasting Co.	250	239.9	1,250
WSRO	Middletown, Ohio	Harry W. Fahrlander	100	236.1	1,270
WSSH	Boston, Mass.	Tremont Temple Baptist Church	100	288.3	1,040
WSUF	Suffolk, Va. (519 West Twenty-first Street, Norfolk, Va.)	Reliance Electric Co.	500	236.1	1,270
WSUI	Iowa City, Iowa	State University of Iowa	500	475.9	690
WSUN	St. Petersburg, Fla.	Clearwater Chamber of Commerce and St. Petersburg Chamber of Commerce	750	516.9	660
WSVS	Buffalo, N. Y., 666 East Delaware Avenue	Seneca Vocational School	50	204.0	1,470
WSYR	Syracuse, N. Y., Hotel Syracuse	Clive B. Meredith	500	226.4	1,330
WTAD	Quincy, Ill.	Illinois Stock Medicine Broadcasting Corporation	250	236.1	1,270
WTAG	Worcester, Mass.	Worcester Telegram Publishing Co.	500	516.9	580
WTAM	Cleveland, Ohio	Willard Storage Battery Co.	3,500	399.8	750
WTAQ	Eau Claire, Wis. (Gillette Rubber Co.)	C. S. Van Gorden	5,000	254.1	1,180
WTAR	Norfolk, Va., 519 West Twenty-first Street	Reliance Electric Co.	500	236.1	1,270
WTAS	Villa Olivia, Hanover Township, Ill. (near Elgin)	Illinois Broadcasting Corporation	500	275.1	1,090
WTAW	College Station, Tex.	Agricultural and Mechanical College of Texas	500	483.6	620
WTAX	Streator, Ill., 115 South Vermillion Street	Williams Hardware Co.	50	242.8	1,210
WTAZ	Richmond, Va.	W. Reynolds, Jr., and Thomas J. McGuire	15	220.4	1,360
WTFF	Mount Vernon Hills, Va.	Independent Publishing Co.	10,000	202.6	1,480
WTFI	Toccoa, Ga.	Toccoa Falls Institute	250	209.7	1,430
WTHS	Atlanta, Ga.	Atlanta Technological High School	200	227.1	1,320
WTIC	Hartford, Conn.	Travelers Insurance Co.	500	535.4	560
WTMJ	Brookfield, Wis.	Milwaukee, Journal	1,000	293.9	1,020
WTRL	Midland Park, N. J., 28 Sicomac Avenue	Technical Radio Laboratory (H. C. Hogencamp)	15	206.8	1,450
WWAE	Chicago, Ill., 2024 Wabash Avenue	Dr. George F. Courier	500	227.1	1,320
WWJ	Detroit, Mich.	Detroit News	1,000	352.7	850
WWL	New Orleans, La.	Loyola University	500	245.8	1,220
WWNC	Asheville, N. C.	Chamber of Commerce	1,000	296.9	1,010
WWRL	Woodside, N. Y., 4130 Fifty-eighth Street	William H. Reuman	100	199.9	1,500
WWVA	Wheeling, W. Va., National Road	John C. Stroebel, Jr.	250	516.9	580

2 Night.

3 Day.

INTERNATIONAL COMPARISON OF FREQUENCY STANDARDS

The increase in power of many United States and foreign radio stations, making them international in their effects, has raised the question as to whether or not the national standards of radio-frequency of the various governments are in agreement. Since 1924 the Bureau of Standards has made several comparisons of frequency standards with the national laboratories of England, France, Italy, Germany, Canada, and Japan. These showed satisfactory agreement to the accuracy then required.

During the past year, however, it has become important to know much more accurately the agreement of the standards of the different nations. The development of the temperature-controlled piezooscillator offered a means of attaining this. Accordingly, during the summer of 1927 Dr. J. H. Dellinger, chief of the radio section, took to Europe such a piezooscillator containing two quartz plates which were carefully calibrated according to the United States standards. The piezooscillator was so constructed that the conditions of operation (tube voltages, temperature, etc.) could be very accurately reproduced at any place. Measurements were made on these piezooscillators at the National Physical Laboratory, England; Laboratoire of the Telegraphie Militaire, France; Italian Naval Laboratory, Italy; and the Physikalisch-Technische Reichsanstalt, Germany, where the national standards of the respective countries are maintained.

The difference between the measurements made at the various laboratories were very small, the average departures from the mean being 3 parts in 100,000. This agreement is surprisingly good. It represents an average difference of only 0.03 kilocycle at 1,000 kilocycles (300 meters). This is much smaller, for instance, than the variation, 0.5 kilocycle, allowed broadcasting stations in this country. In other words, as far as the United States and the larger European countries are concerned, the national standards of frequency agree sufficiently well to insure against interference provided the transmitting stations are accurately adjusted according to their national standards.

STANDARD FREQUENCY STATIONS

For several years the Bureau of Standards has made measurements upon the transmitted waves of a limited number of radio-transmitting stations. Those which were found to hold their frequencies with great accuracy were included in a list published monthly in the Radio Service Bulletin. The demands on the bureau for testing and other urgent work require all the time of the bureau's limited radio staff; measurements on the standard frequency stations have consequently been discontinued.

CONSTANT FREQUENCY STATIONS

The transmitted waves from these stations should be of value to the public as frequency standards because of their constancy and close adherence to their licensed values. The Bureau of Standards makes occasional measurements of the frequencies of some of these stations. Each station employs a special device for controlling or checking the frequency, the calibration of the device having been found by test to be in agreement with the bureau's frequency standards. The most satisfactory special devices are automatic piezocontrol, piezooscillator, or piezoresonator.

Station	Owner	Location	Frequency Kilo-cycles
WTIC	Travelers Insurance Co.	Hartford, Conn.	560
WTAG	Worcester Telegram Publishing Co.	Worcester, Mass.	580
WOW	Woodmen of the World Life Insurance Association	Omaha, Nebr.	590
WEAF	National Broadcasting Co.	New York, N. Y.	610
WRC	Radio Corporation of America	Washington, D. C.	640
WMAQ	Chicago Daily News Co.	Chicago, Ill.	670
WCCO	Washburn-Crosby Co.	St. Paul-Minneapolis, Minn.	740
WTAM	Willard Storage Battery Co.	Cleveland, Ohio.	750
WEAR			
WBBM	Atlas Investment Co.	Chicago, Ill.	770
KGO	General Electric Co.	Oakland, Calif.	780
KTHS	Arlington Hotel Co.	Hot Springs, Ark.	780
WGY	General Electric Co.	Schenectady, N. Y.	790
WOC	Palmer School of Chiropractic	Davenport, Iowa	800
WJJD	Loyal Order of Moose	Mooseheart, Ill.	820
WLS	Sears, Roebuck & Co.	Crete, Ill.	870
WBZ	Westinghouse Electric & Manufacturing Co.	Springfield, Mass.	900
KOA	General Electric Co.	Denver, Colo.	920
KDKA	Westinghouse Electric & Manufacturing Co.	East Pittsburgh, Pa.	950
WBAL	Consolidated Gas, Electric Light & Power Co.	Glen Morris (Baltimore), Md.	1,050
WEAO	Ohio State University	Columbus, Ohio	1,060
WBAA	Purdue University	West Lafayette, Ind.	1,100
KFIZ	Fond du Lac Commonwealth Reporter	Fond du Lac, Wis.	1,120
WHK	Radio Air Service Corporation	Cleveland, Ohio.	1,130
WMBI	Moody Bible Institute of Chicago	Chicago, Ill.	1,140
KTNT	Tangley Co.	Muscatine, Iowa	1,170
WEBJ	Third Avenue Railway Co.	New York, N. Y.	1,170
KWUC	Western Union College	Le Mars, Iowa	1,230
WJAY	Cleveland Radio Broadcasting Corporation	Cleveland, Ohio.	1,320
KFVB	Hirsch Battery & Radio Co.	Cape Girardeau, Mo.	1,340

TESTING AND ADJUSTING PIEZOOSCILLATORS

By order of the Federal Radio Commission, broadcast stations are required to maintain their frequency within 500 cycles (0.5 kilocycle) of their assigned value. To maintain this accuracy of adjustment it is necessary to have special apparatus for checking the frequency of the transmitting set. The only satisfactory devices at present available for this are piezooscillators, piezoresonators, and automatic piezocontrol. A piezooscillator using a quartz plate is a very satisfactory device and can be purchased commercially. Specifications for a portable piezooscillator are given in Bureau of Standards Letter Circular 186. The piezooscillator described in these specifications does not provide for maintaining the quartz plate at constant temperature, which is desirable for the highest accuracy. These specifications do not include directions for cutting and grinding the quartz plate. A suitable plate can be obtained commercially. Letter Circular 223 describes the use of piezooscillators in radio-broadcasting stations. (Copies of these letter circulars may be obtained by persons having actual use for them, by addressing the Bureau of Standards, Washington, D. C.)

When a piezooscillator used as a standard to aid in maintaining the frequency of a station is tested by the Bureau of Standards, there are certain conditions which must be fulfilled. The Bureau of Standards will undertake a test of a piezooscillator only upon written request of the owner or operator of the transmitting station in which the piezooscillator is to be used. This request must contain the following information: (a) Name of the owner of the station where the piezooscillator is to be used, (b) location and call letters of the station, (c) licensed frequency of the station, and (d) type of piezooscillator and quartz plate used.

There is just at present an exceptional demand for radio tests of this kind which is greatly in excess of the capacity of the bureau for immediate service. For this reason it has been necessary to schedule pending tests and to notify each applicant for test of the approximate date the test will be made. Tests already scheduled will require about two months to complete. Every effort is being made to give much quicker service, consistent with accuracy, after that time.

Assignment of a date for test will be made only upon receipt of the written request from the owner or operator of the station giving the required information. The apparatus may be shipped at the time the test is requested or later in time to reach the bureau a few days before the assigned date. The test requires not

less than two days to complete. It is necessary that the entire piezooscillator except tubes and batteries be sent to the bureau. The type of tubes and the voltages should be specified in the letter requesting test.

The quartz plate must have a frequency not more than 1 per cent below the licensed frequency. If it has a frequency higher than the licensed frequency, it can not be adjusted by grinding. The fee for adjustment of quartz plates with mechanical means for adjustment is \$12. The fee for quartz plates which are not provided with a mechanical means for adjustment and which must therefore be adjusted by grinding is \$20. In case it is desired to maintain the quartz plate at a constant controlled temperature higher than room temperature, the work involved in the test is much greater. The fees for such tests are \$25 and \$50, depending on the type of adjustment required.

REFERENCES TO CURRENT RADIO LITERATURE

This is a monthly list of references prepared by the radio laboratory of the Bureau of Standards and is intended to cover the more important papers of interest to professional radio engineers which have recently appeared in periodicals, books, etc. The number at the left of each reference classifies the reference by subject, in accordance with the scheme presented in A Decimal Classification of Radio Subjects—An Extension of the Dewey System, Bureau of Standards Circular No. 138, a copy of which may be obtained for 10 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C. The various articles listed below are not obtainable from the Bureau of Standards. The various periodicals can be consulted at large public libraries.

R000.—Radio communication

- R007.9 Warner, K. B. The amateur and the International Radiotelegraph Conference. *QST*, 12, pp. 15-22; January, 1928.
Results of the International Radiotelegraph Conference from the amateur viewpoint.
- R020 Banneltz, F. *Taschenbuch der drahtlose Telegraphie und Telephonie* (book) (Pocketbook of wireless telegraphy and telephony). Published by J. Springer, Berlin, 1927.
Complete up-to-date compendium of radiotelegraphy and telephony written by a number of German experts.

R100.—Radio principles

- R113 Lardy, M. Suite d'une etude sur la propagation des ondes courtes (continuation of investigation on propagation on short waves). *L'Onde Electrique*, 6, pp. 465-81; October, 1927. Abstract in *Experimental Wireless* (London), p. 31; January, 1928.
Anomalies of propagation on 51 and 31 meters.
- R113.1 Garrique, L. De l'onde hertzienne et de sa propagation (hertzian wave and its propagation). *QST Français et Radioelectricité Reunis*, 8, pp. 53-56; December, 1927.
Discussion of superiority of short over long waves and comparison of fading on these waves.
- R113.2 Pickard G. W. The relation of radio reception to sunspot position and area. *Proc. Inst. Radio Engrs.*, 15, pp. 1004-1012; December, 1927.
Correlation of fading measurements to sunspot variations.
- R113.4 Heising, R. A. Experiments and observations concerning the ionized regions of the atmosphere. *Proc. Inst. Radio Engrs.*, 16, pp. 75-99; January, 1928.
Determination of the height and variation in ionized regions of atmosphere.
- R113.5 Bouthillon, L. Influence de la nature du sol sur l'émission et la réception radioélectrique (influence of the sun on radio transmission and reception). *L'Onde Electrique*, 6, pp. 533-53; November, 1927.
Theoretical discussion of transmission phenomena and antenna systems giving method of measuring electromagnetic fields.
- R113.5 Charman, F. Wave propagation and the weather. *Experimental Wireless* (London), 4, pp. 735-42; December, 1927.
Tests conducted on 30 to 45 meters 2 hours after sunrise in England and correlation with meteorological phenomena.
- R113.5 Wireless and meteorology (atmospherics used to trace progress of hurricanes in the West Indies). *Wireless World and Radio Rev.*, 21, pp. 813-16; December 21, 1927.
Work of U. S. S. *Kittery* recording atmospherics by means of direction finder and correlation with meteorological disturbances.
- R113.6 Cartier, G. La radiophonie et les phénomènes de propagation (reflection, refraction, diffraction). *QST Français et Radioelectricité Reunis*, 8, pp. 3-9; December, 1927.
Mathematical theory of transmission phenomena.
- R113.8 Alway, E. J. Propagation of short waves during a solar eclipse. *Proc. Inst. Radio Engrs.*, 15, pp. 998-1001; December, 1927.
Observations on 30 to 45 meters during solar eclipse of June 29, 1927.

- R114 Lee, A. G. Wireless Section—Chairman's address. *Jnl. Inst. Elec. Engrs. (London)*, 66, p. 12; December, 1927.
Important radio events in England from technical viewpoint—atmospherics, receivers, directive reception with wave antenna, and wavenna arrays.
- R114 Cairns, J. E. I. Atmospherics at Waterloo, Western Australia. *Proc. Inst. Radio Engrs.*, 15, pp. 965-97; December, 1927.
Observations on wave form of atmospherics.
- R125.6 Meissner, A. Raumstrahlung von Horizontal Antennen (space radiation of horizontal antennas). *Elektrot-Nachrichten Technik*, 4, pp. 482-86; November, 1927.
Fields received at different distances—Data on 2 stations on 11 and 15 meters.
- R125.6 Marconi, G. Radio communication. *Proc. Inst. Radio Engrs.*, 15, pp. 40-69; January, 1928.
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- R130 Jobst, G. Drei Beiträge über Schwingungserzeugung (three contributions on production of oscillations). *Telefunken Zeitung*, 11, pp. 11-38; October, 1927.
Theory of production of oscillations in electron tubes.
- R145.3 Bashenoff, V. J. Abbreviated method for calculating the inductance of irregular plane polygons of round wire (part I of paper "On calculation of closed aerials.") *Proc. Inst. Radio Engrs.*, 15, p. 1013-; December, 1927.
Application to coil antennas.
- R170 Klimke, S. Die Störung des elektromagnetischen Feldes eines Senders durch Gebäude und ähnliches (disturbances of electric fields of a transmitter through buildings and similar things). *Elektrot-Nachrichten Technik*, 4, pp. 458-82; November, 1927.
Location and measurement of disturbances to reception.
- R200.—Radio Measurements and standardization
- R210 Braillard, R., and Divoire, E. Die genaue Messung der Wellenlängen bei Sendestellen (exact measurement of wave length in sending stations). *Elektrot-Nachrichten Technik*, 4, pp. 443-58; November, 1927.
Qualities of good transmitting set and good frequency meter—Method of measuring frequency.
- R214 Jouaust, R. Le quartz piezo-électrique comme étalon de fréquence (piezoelectric quartz as standard of frequency). *L'Onde Electrique*, 8, pp. 513-32; November, 1927.
Development and theory of piezooscillators; precautions when used as standard of frequency.
- R214 Harrison, J. R. Piezoelectric resonance and oscillatory phenomena with flexural vibrations in quartz plates. *Proc. Inst. Radio Engrs.*, 15, pp. 1040-1054; December, 1927.
Experimental and mathematical discussion.
- R250 Hazel, H. C. A new method for the calibration of ammeters at radio-frequencies. *Proc. Inst. Radio Engrs.*, 15, pp. 70-74; January, 1928.
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- R270 Barfield, R. H. The attenuation of wireless waves over land. *Experimental Wireless (London)*, 4, pp. 25-30; January, 1928. Also in *Wireless World and Radio Review*, 22, pp. 2-6; January 4, 1928.
Intensity measurements with portable apparatus on transmissions of 2LO (London), giving map of distribution.
- R300.—Radio apparatus and equipment
- R323 Le Marquand, H. Sous-marins et ondes Hertiennes (submarines and Hertzian waves). *QST Français et Radioélectricité Réunis*, 8, pp. 40-42; December, 1927.
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- R325.1 Keen, R. Wireless direction finding and directional reception (book, 2d ed.). Publishers, Hiffe & Sons (Ltd.), London, 1927. Price, 21 shillings. Abstract in *Wireless World and Radio Review*, 22, p. 10, January 4, 1928.
Methods and apparatus used in direction finding.
- R330 Forstmann and Schramm. Die Elektronenröhre (book). Publishers, Schmidt & Co., Berlin, 1927. Reviewed in *Experimental Wireless (London)*, 4, p. 760; December, 1927.
Treatise on electron tubes.
- R331 Simon, H. Einiges über Empfängerröhren (something on receiving tubes). *Telefunken Zeitung*, 11, pp. 38-50; October, 1927.
Construction and description of thoriated filament electron tubes.
- R334 The Cossar screened valve. *Wireless World and Radio Review*, 21, pp. 817-818; December 21, 1927.
Characteristic curves and practical hints for best conditions of operation.
- R340 The power factor and capacity of the electrodes and base of triode valves, with special reference to their use in thermionic voltmeters. *Experimental Wireless (London)*, 5, p. 16; January, 1928.
Table giving capacity and power factor of several types of tube bases.

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