DEPARTMENT OF COMMERCE

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY RADIO DIVISION

Washington, February 29, 1928—No. 131

CONTENTS

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 = Call signal (letters) assigned.
System = Radio system used and sparks per second.
Range = Normal range in nautical miles.
W. l. = Wave lengths assigned: Normal wave lengths in italics.
Service = 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—
Alameda, Calif.[1]	KFU	39.45	FX	X	Alaska Packers Association.
Evans Bay, Alaska [2]	KUR	600, 706, 1550	FX	X	Franklin Packing Co.
Manila, P. I. (KZED) [3]	KZED	27.5	FX	N	Radio Corporation of the Philippines.
Do. (KZEN) [4]	KZEN	15	FX	N	Do.
Do. (KZET) [4]	KZET	30	FX	N	Do.
Naknek, Alaska (KTZ) [5]	KTZ	39.45	FX	X	Alaska Packers Association.
View Cove, Alaska [6]	KSJ	600, 706, 1576	FX		Pacific Coast Cement Co.

[1] System, composite v. t. telegraph.
[2] Loc. 148° 03′ 36″ W., 60° 03′ 18″ N.; system, spark, 1000.
[3] Loc. 121° 06′ 15″ E., 14° 37′ 15″ N.; range, 1000; system, c. w.
[4] Loc. 121° 03′ 15″ E., 14° 37′ 15″ N.; range, 8000; system, c. w.
[5] System, composite v. t. telegraph.
[6] System, Navy-Marconi, 1000; hours, 8 a. m. to 12 midnight.

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—
Alki [1]	WQBX		P	X	City of Seattle, fire department.	Owner of vessel.
Caliche	WQBR	8	PG	X	Anglo-Chilean Consolidated Nitrate Corporation.	
D. P. Thompson [2]	WQBW		PG	X	Pioneer S. S. Co.	I. R. T. Co.
Illyria	WQBU				Cornelius Crane.	
Louie Black [3]	WQBS		P	X	Wilmington Transportation Co.	Owner of vessel.
Mary Ellen O'Neil	WQBV	8	PG	X	California Petroleum S. S. Corporation.	
Nourmahal (WQBT)	WQBT				Vincent Astor.	

[1] System, composite v. t. telephone and telegraph; w. l., 127.7.
[2] System, Navy-Simon, 1000; w. l., 715, 800, 875; rates, Great Lakes service, 4 cents per word.
[3] System, composite, c. w. and phone; w. l., 109.

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
KFU	Alameda, Calif.....c	KZET	Manila, P. I.....c
KSJ	View Cove, Alaska.....c	WQBS	Louie Black.....b
KTZ	Naknek, Alaska.....c	WQBT	Nourmahal.....b
KUR	Evans Bay, Alaska.....c	WQBU	Illyria.....b
KVG	Caliche.....b	WQBV	Mary Ellen O'Neil.....b
KZEN	Manila, P. I.....c	WQBW	D. P. Thompson.....b
KZED	Do.....c	WQBX	Aiki.....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—
San Jose to Pan America Goodwill Plane.[1]	KHAE	32-34	P	X	James C. Angel and Herald Hall.

[1] System, composite v. t. telegraph (power, 50 watts).

Commercial aircraft stations, alphabetically, by call signals

Call signal	Name of station	Call signal	Name of station
KHAE	San Jose to Pan America Goodwill Plane.		

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]

Station and city	Call signal	Wave length (meters)	Frequency (kilocycles)	Power (watts)
Colorado: Pueblo	KGHA	209.7	1,430	500
West Virginia: Weirton	WQBZ	249.9	1,200	60

Broadcasting stations, alphabetically, by call signals

Call signal	Location of station (address)	Owner of station	Power (watts)	Wave length (meters)	Frequency (kilocycles)
KGHA	Pueblo, Colo.	George H. Sweeney and N. S. Walpole.	500	209.7	1,430
WQBZ	Weirton, W. Va., 3337 Elm Street	J. H. Thompson	60	249.9	1,200

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—
New London, Conn	NGH		O		U. S. Coast Guard.
Seattle, Wash.[1]	WVD		FX	N	U. S. Army.

[1] Loc. 122° 20′ 12″ W., 47° 36′ 30″ N.; range, 1000; system, U. S. Army v. t. telegraph; service, Alaska public service only. Also does official business.

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
NGH	New London, Conn.....c	WVD	Seattle, Wash.....c

Special 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]

Station	Call signal	Wave length (meters)	Frequency (kilocycles)	Power (watts)	Station controlled by—
Massachusetts: Newton.....	1XS	20	14,991	500	Reginald A. Fessenden, 45 Waban Hill Road.

Special land stations, grouped by districts

Call signal	District and station	Call signal	District and station
1XS	First district: Newton, Mass.....		

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]

MANILA, P. I.—System, c. w. and i. c. w.; w. l., *600*, 1600.
SEATTLE, WASH. (KPA).—W. l., 50.82.

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]

ALL AMERICA.—Range, 200–300; w. l., *600*, 705, 800, 1875, 1911, 1987, 2098; service, P; hours, X.
AMERICAN.—Range, 200; w. l., *600*, 705, 800.
CALIFORNIA.—Station controlled by R. M. C. A.
CATHERINE D.—Station controlled by R. M. C. A.
COMMERCIAL MARINER.—Owner of vessel, Commercial Mariner S. S. Co.

COMUS.—System, Marconi, 1000; w. l., *600*, 705, 800.
COSTA RICA.—W. l., *600*, 705, 800.
DIAMOND HEAD.—Owner of vessel, Los Angeles S. S. Co.
EL ALBA.—System, Marconi, 1000; w. l., *600*, 705, 800.
EL CAPITAN (KKH).—W. l., *600*, 705, 800.
EL CICUTA.—Owner of vessel, James Griffiths & Sons.
EL COSTON.—Range, 150; w. l., *600*, 705, 750, 800.
EL DIA.—W. l., *600*, 705, 800.
EL NORTE.—W. l., *600*, 705, 800.
EL OCEANA.—W. l., *600*, 705, 750, 800.
EL SIGLO.—W. l., *600*, 705, 800.
EL VALLE.—W. l., *600*, 705, 800.
EMMA H. COPPAGE.—Owner of vessel, California Petroleum S. S. Corporation.
GLACIER.—W. l., *600*, 705, 800.
GUARDIAN.—Range, 250; w. l., *600*, 705, 800.
HEGIRA.—W. l., *600*, 705, 800.
KANSAN.—W. l., *600*, 705, 800.
KETCHIKAN.—Name changed to Nizina.
LIBERTY.—Rates, 8 cents per word.
MARY D.—Range, 300; w. l., *600*, 705, 800.
MEXICAN.—W. l., *600*, 705, 800.
MILTON S. PATRICK.—Range, 100; system, composite v. t. telephone and telegraph; w. l., 109.1; service, P; hours, X; station controlled by owner of vessel.
MISSOURIAN.—W. l., *600*, 705, 800.
MOJAVE.—W. l., 600, 705, 800; 1875, 1987, 2098; station controlled by R. M. C. A.
MONTANAN.—W. l., *600*, 705, 800.
MUNLEON.—Owner of vessel, Charles R. McCormick Lumber Co.
NEBRASKAN.—W. l., *600*, 705, 800.
NEVADAN.—System, Marconi, 1000; w. l., *600*, 705, 800.
OCEANUS.—Name changed to Oceania.
PRESIDENT LINCOLN.—Range, 150–500; w. l., *600*, 705, 800, 1911, 1987, 2098, 2190.
PRESIDENT PIERCE.—Range, 150–500; w. l., *600*, 705, 800, 1887, 1987, 2098, 2190.
REDWOOD.—Range, 200; w. l., *600*, 705, 750, 800; service, PG; hours, N and X (N when operated as first-class station, X when operated as third-class station).
SCHENECTADY.—Owner of vessel, American Scantic Line.
SILVERSPRUCE.—Owner of vessel, Clegg Shipowning Corporation.
STAR OF ZEALAND.—System, Navy-Marconi, 1000; w. l., *600*, 705, 800.
THE LAMBS.—Owner of vessel, Export S. S. Corporation.
TRIMOUNTAIN.—Owner of vessel, Trimountain S. S. Corporation.
TRINIDAD.—System, R. C. A. v. t. telegraph; w. l., *600*, 706, 800, 900, 1040; service, P; hours, N.
VIRGINIAN.—W. l., *600*, 705, 800.
Strike out all particulars of the following-named vessel: El Abeto.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY, BY CALL SIGNALS

KFYG, name changed to Oceania; WAE, name changed to Nizina; strike out all particulars following the call signal, KENN.

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]

KELW (Burbank, Calif.).—Power, 500.
KEX (Portland, Oreg.).—W. l., 277.6, fy. kc., 1,080.
KFBK (Sacramento, Calif.).—W. l., 275.1, fy. kc. 1,090.
KFCR (Santa Barbara, Calif.).—Power, 100.
KFEL (Denver, Colo.).—W. l., 227.1, fy. kc. 1,320.
KFEQ (St. Joseph, Mo.).—Power, 1,000 night, 2,000 day.
KFHA (Gunnison, Colo.).—W. l., 249.9, fy. kc., 1,200.
KFIF (Portland, Oreg.).—W. l., 228.9, fy. kc., 1,310.
KFJR (Portland, Oreg.).—Power, 500; W. l., 239.9, fy. kc., 1,250.
KFKA (Greeley, Colo.).—Power, 500 night, 1,000 day.
KFOY (St. Paul, Minn.).—This station and WAMD consolidated; call letters KSTP assigned in lieu of both former calls; location changed to Wescott, Minn.; power, 2,000.

KFQB (Fort Worth, Tex.).—Owner of station, changed to W. B. Fishburn, (Inc.).
KFQU (Alma-Holy City, Calif.).—W. l., 208.2, fy. kc., 1,440.
KFQZ (Hollywood, Calif.).—Power, 250.
KFSG (Los Angeles, Calif.).—W. l., 252, fy. kc., 1,190.
KFUM (Colorado Springs, Colo.).—W. l., 485.6, fy. kc., 620.
KFUS (Oakland, Calif.).—W. l., 208.2, fy. kc., 1,440.
KFVD (Venice, Calif.).—W. l., 215.7, fy. kc., 1,390.
KFWB (Hollywood, Calif.).—W. l., 352.7, fy. kc., 850.
KFWC (Ontario, Calif.).—W. l., 247.8, fy. kc., 1,210.
KFXJ (Edgewater, Colo., near).—W. l., 209.7, fy. kc., 1,430.
KGCL (Seattle, Wash.).—Power, 100.
KGEF (Los Angeles, Calif.).—Power, 1,000.
KGEW (Fort Morgan, Colo.).—Power, 100 night, 200 day.
KGEY (Denver, Colo.).—Change to Belleview College (Denver), Colo.; call changed to KPOF; owner of station, Pillar of Fire (Inc.); power, 500.
KGFH (La Crescenta, Calif.).—W. l., 263, fy. kc., 1,140.
KGFJ (Los Angeles, Calif.).—W. l., 212.6, fy. kc., 1,410.
KGTT (San Francisco, Calif.).—W. l., 220.4, fy. kc., 1,360.
KGY (Lacy, Wash.).—W. l., 245.8, fy. kc., 1,220.
KHAC (Airplane).—Call changed to KFBI.
KIOS (Eugene, Oreg.).—Call changed to KOOS.
KJBS (San Francisco, Calif.).—Power, 100.
KKP (Seattle, Wash.).—W. l., 202.6, fy. kc., 1,480.
KLIT (Portland, Oreg.).—W. l., 199.9, fy. kc., 1,500.
KLZ (Denver, Colo.).—Changed to Dupont, Colo.; w. l., 352.7, fy. kc., 850; power, 1,000.
KMBC (Independence, Mo.).—Call incorrectly cited in Radio Service Bulletin No. 130, January 31, 1928, as KMBS.
KMED (Medford, Oreg.).—W. l., 270.1, fy. kc., 1,110.
KMO (Tacoma, Wash.).—Power, 500.
KOA (Denver, Colo.)—Power, 5,000.
KOMO (Seattle, Wash.).—W. l., 309.1, fy. kc., 970.
KOW (Denver, Colo.).—W. l., 218.8, fy. kc., 1,370.
KPCB (Seattle, Wash.).—Power, 100.
KPLA (Los Angeles, Calif.).—W. l., 288.3, fy. kc., 1,040.
KPPC (Pasadena, Calif.).—W. l., 315.6, fy. kc., 950.
KRE (Berkeley, Calif.).—W. l., 245.8, fy. kc., 1,220.
KRLO (Los Angeles, Calif.).—Call changed to KEJK; w. l., 252, fy. kc., 1,190.
KRSC (Seattle, Wash.).—W. l., 202.6, fy. kc., 1,480.
KTBI (Los Angeles, Calif.).—Power, 1,000; w. l., 275.1, fy. kc., 1,090.
KTBR (Portland, Oreg.).—W. l., 228.9, fy. kc., 1,310.
KVI (Tacoma, Wash.).—W. l., 282.8, fy. kc., 1,060; power, 250.
KVOS (Bellingham, Wash.).—Power, 250.
KWJJ (Portland, Oreg.).—W. l., 249.9, fy. kc., 1,200.
KWTC (Santa Ana, Calif.).—W. l., 272.6, fy. kc., 1,100.
KXL (Portland, Oreg.).—Power, 100.
KXRO (Aberdeen, Wash.).—W. l., 223.7, fy. kc., 1,340.
KYA (San Francisco, Calif.).—Power, 1,000; w. l., 361.2, fy. kc., 830.
KZM (Oakland, Calif.).—W. l., 208.2, fy. kc., 1,440.
WBET (Boston, Mass.).—Changed to Medford, Mass.
WDWF (Cranston, R. I.).—W. l., 247.8, fy. kc., 1,210.
WGHP (Mount Clemens, Mich.).—Changed to Fraser, Mich.
WGWB (Milwaukee, Wis.).—Owner changed to Evening Wisconsin Co., 467 Jackson St.; power, 250; w. l., 270.1, fy. kc., 1,110.
WHBL (Chicago, Ill., portable).—Changed to Sheboygan, Wis.; owner of station, Press Publishing Co. and C. L. Carrell; power, 250 night, 500 day.
WLBM (Boston, Mass.).—Changed to Cambridge, Mass.
WLSI (Cranston, R. I.).—W. l., 247.8, fy. kc., 1,210.
WMBE (St. Paul, Minn.).—Changed to White Bear Lake, Minn.
WMBI (Chicago, Ill.).—Changed to Addison, Ill.; power, 5,000.
WNBH (New Bedford, Mass.).—W. l., 260.7, fy. kc., 1,150.
WQBC (Utica, Miss.).—Power, 225.
WQBO (Gulfport, Miss.).—Call changed to WGCM.
WRST (Bay Shore, N. Y.).—Power, 150.
WSEA (Virginia Beach, Va.).—Changed to Portsmouth, Va.
WSUF (Norfolk, Va.).—Call changed to WPOR.
WSYR (Syracuse, N. Y.).—W. l., 293.9, fy. kc., 1,020.

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]

FARENHOLT.—Call changed to NEMQ.
STURGEON BAY.—Strike out all particulars.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY, BY CALL SIGNALS

NECK, changed to NEMQ; strike out all particulars following the call signal NITZ.

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
Commercial:		
Alabama	WFB	Goodrich Transit Co.
Aryan	KOLB	Texas Co.
Colombia	WBH	Panama Mail S. S. Co.
Ecuador	WBN	Do.
Occidental	KUSJ	Texas Co.
Princeton	KST	Standard Shipping Co.
Robert W. Stewart		Standard Oil Co. of Indiana.
Venezuela	WBG	Panama Mail S. S. Co.
Yarmouth	KGAY	Nova Scotia S. S. Corporation.
Government: Discoverer	NIJT	Coast and Geodetic Survey.

[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]

Los Angeles Harbor Light Station, Calif.—Operating period changed; now transmits every 180 seconds, single dashes for 60 seconds, silent 120 seconds, thus:

$$\frac{\text{----etc.}}{\text{60 seconds.}} \qquad \frac{\text{Silent}}{\text{120 seconds.}}$$

Transmits daily during clear weather from 9 to 9.30 and 3 to 3.30 a. m., and p. m.; also during the second 15 minutes of each hour from 6.15 p. m. to 7.30 a. m.

SCHEDULE OF TRANSMISSION OF ICE-PATROL BULLETINS BY NAVAL STATIONS

The radio messages from the ice-patrol vessel and from other sources will be given publicity by the Hydrographic Office, as follows:

Station	Call signal	Time		Frequency (kilocycles)	Wave length (meters)	Type of wave
		G. C. T.	Seventy-fifth meridian-standard			
Washington, D. C.	NAA	[1] 1500	10 a. m.[1]	112, 16,060	2,677, 18.6	A. C. W.
		0300	10 p. m.	112	2,677	Do.
Boston, Mass.	NAD	1600	11 a. m.	102	2,939	C. W.
		2200	5 p. m.			
Newport, R. I.	NAF	1600	11 a. m.	118	2,541	A. C. W.
		2200	5 p. m.			
New York, N. Y.	NAH	1530	10.30 a. m.	108	2,776	C. W.
		2200	5 p. m.			
Norfolk, Va.	NAM	1545	10.45 a. m.	104	2,883	I. C. W.
		2100	4 p. m.			

[1] Ice data follows the weather bulletin.

For further information regarding the ice patrol see Radio Service Bulletin No. 130, January 31, 1928.

AMATEUR STATION LICENSE SUSPENDED

The Federal Radio Commission recently suspended the station license of an amateur operator for a period of six months, as the station was operated on a wave length and from a place other than that specified in the license. The operation of this station interfered with broadcast reception, which brought about the report causing the suspension.

LIST OF RADIO DISTRICTS OF THE DEPARTMENT

The department has the country divided into nine districts for the expeditious handling of business. Each district is in charge of a "supervisor of radio," to whom communications relative to operators' licenses, station licenses, and other matter pertaining only to the particular district concerned should be addressed. Communications of a general nature should be addressed to the "Chief, Radio Division, Department of Commerce, Washington, D. C."

Hereunder is a list of the districts, giving the address of the supervisors and the territory embraced by each district. These districts should not be confused with the five zones established by the act (February 23, 1927, section 2) creating the Federal Radio Commission.

1. Headquarters, Customhouse, Boston, Mass.: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut.

2. Headquarters, Subtreasury Building, New York, N. Y.: New York (county of New York, Staten Island, Long Island, and counties on the Hudson River to and including Schenectady, Albany, and Rensselaer) and New Jersey (counties of Bergen, Passaic, Essex, Union, Middlesex, Monmouth, Hudson, and Ocean).

3. Headquarters, Customhouse, Baltimore, Md.: New Jersey (all counties not included in second district), Pennsylvania (counties of Philadelphia, Delaware, all counties south of the Blue Mountains, and Franklin County), Delaware, Maryland, Virginia, District of Columbia.

4. Headquarters, Post Office Building, Atlanta, Ga.: North Carolina, South Carolina, Georgia, Florida, Tennessee, Porto Rico, Virgin Islands.

5. Headquarters, Customhouse, New Orleans, La.: Alabama, Mississippi, Louisiana, Texas, Arkansas, Oklahoma, New Mexico.

6. Headquarters, Customhouse, San Francisco, Calif.: California, Hawaii, Nevada, Utah, Arizona.

7. Headquarters, L. C. Smith Building, Seattle, Wash.: Oregon, Washington, Alaska, Idaho, Montana, Wyoming.

8. Headquarters, Commerce Building, Detroit, Mich.: New York (all counties not included in the second district), Pennsylvania (all counties not included in the third district), West Virginia, Ohio, Michigan (Lower Peninsula).

9. Headquarters, Federal Building, Chicago, Ill.: Indiana, Illinois, Wisconsin, Michigan (Upper Peninsula), Minnesota, Kentucky, Missouri, Kansas, Colorado, Iowa, Nebraska, South Dakota, North Dakota.

BROADCAST STATION LICENSES EXTENDED

Federal Radio Commission, General Order No. 23, February 20, 1928.—All existing licenses to broadcast, subject to such modifications and extensions as may be appended thereto, are hereby further extended for 30 days to terminate at 3 a. m. April 1, 1928, unless otherwise modified.

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

The following changes should be made to the list published in the January 31, 1928, No. 130, edition of this publication: Additions, sixth naval district (NRRF), Atlanta, Ga., amateur call signal 4NV; eighth naval district (NRRH), New Orleans, La., amateur call signal 5UB; change NRRK from Richmond, Va., to Baltimore, Md., amateur call signal 3RD.

TRANSMISSION OF WEATHER REPORTS, FORECASTS, AND WARNINGS BY THE WEATHER BUREAU THROUGH ARLINGTON NAVAL STATION

The United States Weather Bureau now broadcasts weather reports, forecasts, and warnings in International Morse Code, in accordance with the following schedule. The broadcasts are made directly from the Weather Bureau office in

Washington, D. C., in cooperation with the Office of Communications of the Navy Department, by distant control connection with the naval radio station (NAA) at Arlington, Va.

Schedules in eastern standard time (75th meridian time)

(*a*) 8.15 a. m.—Current weather observations from stations in the United States, Canada, and Alaska. Broadcast simultaneously on frequencies of 4,015, 8,030, and 12,045 kilocycles (74.7, 37.4, and 24.9 meters, respectively).

(*b*) 10 a. m.—Bulletin containing weather reports, information, forecasts, and storm warnings for the benefit of marine and aviation interests. Broadcast simultaneously on frequencies of 112 and 16,060 kilocycles (2,677 and 18.6 meters, respectively).

(*c*) 11 a. m.—Observation reports from selected United States and Canadian land stations and Atlantic ship reports for the benefit of European meteorological services. Broadcast on a frequency of 12,045 kilocycles (24.9 meters).

(*d*) 8.15 p. m.—Current weather observations from stations in the United States, Canada, and Alaska. Broadcast on a frequency of 4,015 kilocycles (74.7 meters).

(*e*) 10 p. m.—Immediately following the time signals. Bulletin containing weather reports, information, forecasts, and storm warnings for the benefit of marine and aviation interests. Broadcast simultaneously on frequencies of 36 and 112 kilocycles (8,328 and 2,677 meters, respectively).

(*f*) 11 p. m.—Observation reports from selected United States, Canadian, and Alaskan stations, and Atlantic ship reports, for the benefit of European meteorological services. Broadcast on a frequency of 4,015 kilocycles (74.7 meters).

The 8.15 a. m. (*a*) and 8.15 p. m. (*d*) broadcasts are made in the regular United States Weather Bureau word code, which can be easily translated by means of a code book (Weather Bureau Code, 1924, W. B. No. 814), copies of which may be procured from the Superintendent of Documents, Washington, D. C., at $1.25. They consist of weather observations of current date taken, respectively, at 8 a. m. and 8 p. m. at about 200 stations in the United States, Canada, and Alaska, and show sea-level barometric pressure, current temperature, wind direction, temperature (minimum in a. m. reports and maximum in p. m. reports), wind velocity, amount of precipitation, clouds (kind, direction, and rate of movement), and other data. These broadcasts are made for the benefit of Army, Navy, and commercial aviation fields, for business organizations, and as a general public service.

The 10 a. m. (*b*) and 10 p. m. (*e*) broadcasts are the regular marine and aviation bulletins heretofore broadcast at 10.30 a. m. and 10.30 p. m. A detailed description of these broadcasts appears in Weather Bureau Radio Circular No. 13, dated July 15, 1925.

The 11 a. m. (*c*) and 11 p. m. (*f*) broadcasts are in the International Numeral Code and are primarily intended for the benefit of European meteorological services. It forms a part of the system of international exchange of weather information and, in a more extended form, replaces what is known as the "Angot" Bulletin, heretofore transmitted at 4.30 p. m. and midnight. The broadcasts are repeated from the radio station on the Eiffel Tower in Paris. They consist, respectively, of 8 a. m. and 8 p. m. observations of current date from 75 selected stations and indicate the name of the station, barometric pressure in millibars, pressure change during preceding two hours, wind direction, state of weather, and temperature; also reports from ships in the western portion of the Atlantic Ocean. Information concerning the code used in these bulletins may be obtained upon application to the Weather Bureau at Washington, D. C.—*Weather Bureau, January 26, 1928, Circular No. 16.*

PROVISIONAL REGULATIONS FOR THE CONDUCT OF LONG, CONTINUOUS WAVE SHIP AND SHORE COMMERCIAL COMMUNICATION

Owing to the absence of any regulations for the conduct of commercial ship and shore radio communication on long, continuous waves and in anticipation of the coming into force of the International Radiotelegraph Convention made at Washington in November, 1927, it has been agreed between representatives of Great Britain, Denmark, France, Germany, Holland, Norway, Sweden, the Canadian Marconi Co., and the Radiomarine Corporation of America, that, subject to the approval of their respective administrations, provisional regulations for the handling of commercial traffic on "long, continuous waves" shall

be adopted by the operators of the coast stations and ships under their control at the earliest practicable date. The waves to be employed in the service are as follows:

Employment of waves	Frequency (kilocycles)	Wave length (meters)
Ship stations only	160	1,875
Do	159	1,887
Do	157	1,911
Do	155	1,935
Do	153	1,961
Special intership wave	151	1,987
Reserved for Devizes, England	149	2,013
Reserved for Bergen, Norway	147	2,041
Reserved for Havre, France	145	2,069
Calling	143	2,100
Reserved for Chatham, Mass	141	2,128
Reserved for Louisburg, Canada	139	2,158
Reserved for East Moriches, N. Y	137	2,190
Reserved for Scheveningen, Holland	135	2,222
Reserved for Gottenborg, Sweden	133	2,258
Reserved for Norddeich, Germany	131	2,290
Reserved for Chatham, Mass	129	2,326
Reserved for Louisburg, Canada	127	2,362
Reserved for East Moriches, N. Y	125	2,400
Reserved for Copenhagen, Denmark	123	2,440
For European stations generally	121	2,479
Do	119	2,521
For North American stations generally	117	2,564
Do	115	2,609
Do	113	2,655
Do	111	2,703

Any of the specially allocated waves between 149 and 123 kilocycles (2,013 and 2,440 meters) may be employed by any ship or station in the commercial ship and shore services when not required by the coast station to which it is allocated. This station, however, shall have the right to resume the use of the wave immediately on demand.

The following regulations are to be observed in the handling of traffic on "long, continuous wave":

(*a*) Every coast station conducting communication on a long, continuous wave must listen on the wave on 143 kilocycles (2,100 meters) unless otherwise indicated in Berne list of stations. The coast station transmits all its traffic on the wave or waves specially assigned to it.

(*b*) When a mobile station desires to establish communication on a long, continuous wave with another station of the mobile service, it must use the wave of 143 kilocycles (2,100 meters) unless otherwise indicated in the Berne list of stations. This wave, designated as the general communication wave, must be used for calls and answers to calls or for sending signals preliminary to the transmission of traffic.

(*c*) A mobile station after establishing communication on the general communication wave with another station in the mobile service may transmit its traffic on any wave in the authorized band on condition that it does not disturb the working of a coast station or working in progress on the calling wave.

(*d*) As a general rule, every mobile station equipped for service on long, continuous waves which is not engaged in communication on another wave must, in order to permit the exchange of traffic with other stations of the mobile service, return to the wave of 143 kilocycles (2,100 meters) for 10 minutes from the beginning of the thirty-fifth minute to the beginning of the forty-fifth minute of each hour, Greenwich mean time, during their specified hours of watch, according to the class to which the station in question belongs.

(*e*) Coast stations transmit their traffic lists at specified times, published in the Berne list of stations, on the wave or waves which are assigned to them. Outside the times fixed for the transmission of their traffic lists, coast stations may call mobile stations *individually, at any time, according to circumstances* or according to the work which they have to carry out. These individual calls may be made on the wave of 143 kilocycles (2,100 meters) in areas where there is no congestion of traffic.

When the foregoing arrangements are fully established, it is the intention that continuous-wave communication shall be carried out on certain definite waves which give just sufficient clearance between one another to allow of working without undue interference. Care should be taken not to use waves other than those specified in the table, as otherwise interference is certain to be caused with the wave on each side. It is particularly necessary that this point should be attended to by all ships in the North Atlantic.

ARRANGEMENTS FOR RECEPTION OF CALLS AND TRAFFIC BY DEVIZES, ENGLAND

The regulations in the foregoing article will be effective March 1, 1928, in as far as the British coast station at Devizes, England, is concerned.

The transmitting waves of this station are 149 kilocycles (2,013 meters, 6 kilowatts), 143 kilocycles (2,100 meters, 6 kilowatts), and 121 kilocycles (2,479 meters, 25 kilowatts).

Devizes will call ships for which there is traffic every three hours on the 149 kilocycles (2,013 meters) wave at 30 minutes past the hour, G. M. T.; that is, at 0030, 0330, 0630, etc., and arrange the times and waves on which communication will take place.

Ships will call Devizes on the 149 kilocycles (2,013 meters) wave unless otherwise instructed by Devizes and will pass traffic on waves designated by Devizes.

METEOROLOGICAL BULLETIN AND TIME SIGNALS TRANSMITTED BY GUADALAJARA DE JALISCO (MEXICO) STATION

The meteorological bulletin from Tacubaya Observatory is transmitted from this station at 1900, and the time signal is transmitted at 1200. Location (approximately), 103° 21′ W., 20° 41′ N.; call signal, XDF; wave length, 600 meters.

WEATHER BULLETIN TRANSMITTED BY NASSAU (BAHAMAS) STATION

A weather bulletin is transmitted from this station at 1400 on 600 meters, spark. Call signal, VPN.

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 1130, G. M. T. If at any time ships anticipate bad weather in entering the port and desire signals to be sent earlier than 1130, they should communicate with the station, and position signals will be transmitted at an earlier hour. Location (approximately), 83° 03′ W., 10° 00′ N.; call signal, UX.

PILOT BOAT TO TRANSMIT RADIOBEACON SIGNALS OFF COBH (QUEENSTOWN), IRELAND

In order to assist vessels approaching Cobh (Queenstown) Harbor to locate Daunt Rock Light Vessel during fog or rain, the pilot boat will go out to the light vessel and from its immediate vicinity will, upon request of approaching vessels, broadcast a series of radio signals (— . — . — . etc.) for a period of at least 1 minute. Such radio direction signals will be sent by the pilot boat from a point to the eastward of the light vessel. Under no circumstances will signals be sent from a point westward of the light vessel. Pilot boats will go out to the light vessel for this purpose only when weather and other circumstances permit. The harbor board assumes no responsibility. Approximate location of light vessel is 8° 15′ W., 51° 43′ N.

RADIOBEACON ESTABLISHED ON ANHOLT KNOB LIGHT VESSEL, DENMARK

A beacon has been established on this vessel, located in approximately 11° 51′ E., 56° 46′ N.; call signal, OUR; wave length, 950 meters; range, 30 miles. The signal consists of the letters AKAK (.— —.— .— —.—), followed by 10 dashes (— — — — — — — — — —), transmitted every 6 minutes during foggy weather.

CHANGE IN RADIOBEACON OF FINNGRUNDET LIGHT VESSEL, GULF OF BOTHNIA, SWEDEN

The characteristic of this vessel's radiobeacon, located in approximately, 18° 31′ E., 61° 02′ N., consists of the transmission of the letter J (.— — —) sent twice, followed by 15 dots (with intervals of 1.3 seconds between each dot) every minute, thus: .— — — .— — — . . . . . .

The submarine transmitter sounds four blasts in quick succession every 30 seconds. It will commence simultaneously at the end of the last dash of the second J of the radiobeacon signal. When heard in the receivers on board, the number of the dot in the group of radio signals which coincides with the first submarine signal is the distance in miles of the ship from the light vessel. Thus, if the tenth dot is received simultaneously with the first submarine signal, the distance is 10 miles (velocity of sound in water=1 mile in 1.3 seconds).

RADIOBEACON ESTABLISHED AT CAPE BARFLEUR, FRANCE

A beacon has been established at the Cape Barfleur Lighthouse, located in approximately 1° 16′ W., 49° 42′ N. This station, which operates on 1,000 meters i. c. w. and has a range of 50 miles, transmits during foggy weather four groups of signals every 10 minutes, each group consisting of the following signals:

• • — • • • — • • • — • 12 seconds	— — — — — — etc. 26 seconds
• • — • • • — • • • — • 12 seconds	Silent 10 seconds

The transmission of these signals commences at the tenth, twentieth, thirtieth, fortieth, fiftieth, and sixtieth minutes of each hour. The beacon at present is experimental.

REQUESTS FOR PILOT RECEIVED BY TERSCHELLING ZEEGAT LIGHT VESSEL, HOLLAND

Vessels bound for Terschelling Zeegat, Holland, may send requests for a pilot by radio to Terschelling Bank Light Vessel, giving the name of the ship and time of expected arrival off Stortemelk light-and-whistle buoy. If the Terschelling pilot boat fails to meet the ship, the former will cruise in the direction of Terschelling Bank Light Vessel. The radio station is engaged during the last 20 minutes of each hour, from 0540 to 2200.

ACTIVITIES OF THE RADIO DIVISION

During the past six months one additional test car was added to the service and assigned to the fourth radio district, which includes North Carolina, South Carolina, Georgia, Florida, Tennessee, and Porto Rico.

In the eighth district trips were made to several cities in New York, Ohio, and Michigan, where investigations were made of interference caused to radio reception by transmitting stations, as well as a number of inspections of broadcasting, amateur, and other classes of stations. A number of examinations were held for radio operator.

An inspection trip is now being made through Louisiana, Texas, Oklahoma, and Arkansas by the supervisor of the fifth district in the test car of the fourth district, accompanied by the supervisor of that district. The division is contemplating placing a test car in the sixth and ninth districts in the near future.

Broadcasting stations of the United States, alphabetically, by States and cities

State and city	Call signal	Wave length (meters)	Frequency (kilocycles)	Power (watts)
ALABAMA:				
Auburn	WAPI	340.7	880	1,000
Birmingham	WBRC	241.8	1,240	250
Do	WKBC	218.8	1,370	10
Gadsden	WJBY	234.2	1,280	50
Montgomery	WIBZ	230.6	1,300	15
ALASKA:				
Anchorage	KFQD	344.6	870	100
Juneau	KFIU	225.4	1,330	10
Ketchikan	KGBU	399.8	750	500
ARIZONA:				
Flagstaff	KFXY	205.4	1,460	25
Phoenix	KFAD	272.6	1,100	500
Do	KFCB	243.8	1,230	125
Prescott	KPJM	214.2	1,400	15
Tucson	KGAR	234.2	1,280	100
ARKANSAS:				
Blytheville	KLCN	285.5	1,050	50
Fayetteville	KUOA	296.9	1,010	500
Hot Springs	KTHS	384.4	780	1,000
CALIFORNIA:				
Alma (Holy City)	KFQU	208.2	1,440	100
Avalon	KFWO	299.8	1,000	250
Berkeley	KRE	245.8	1,220	100
Burbank	KELW	228.9	1,310	500
El Centro	KGEN	225.4	1,330	15
Fresno	KMJ	365.6	820	50
Hollywood	KFQZ	232.4	1,290	250
Do	KFWB	352.7	850	500
Do	KMIC	223.7	1,340	250
La Crescenta	KGFH	263.0	1,140	250
Long Beach	KFON	241.8	1,240	500
Do	KGER	215.7	1,390	100
Los Angeles	KFI	468.5	640	5,000
Do	KEJK	252.0	1,190	250
Do	KFPR	232.4	1,290	250
Do	KFSG	252.0	1,190	500
Do	KGEF	263.0	1,140	1,000
Do	KGFJ	212.6	1,410	100
Do	KHJ	399.8	750	500

Broadcasting stations of the United States, alphabetically, by States and cities—Con.

State and city	Call signal	Wave length (meters)	Frequency (kilocycles)	Power (watts)
CALIFORNIA—Con.				
Los Angeles	KMTR	526.0	570	500
Do	KNX	336.9	890	500
Do	KPLA	288.3	1,040	500
Do	KTBI	275.1	1,090	1,000
Oakland	KFUS	208.2	1,440	50
Do	KFWM	236.1	1,270	[1] 500 [2] 1,000
Do	KGO	384.4	780	5,000
Do	KLS	245.8	1,220	250
Do	KLX	508.2	590	500
Do	KTAB	280.2	1,070	500
Do	KZM	208.2	1,440	100
Ontario	KFWC	247.8	1,210	100
Pasadena	KPPC	315.6	950	50
Do	KPSN	315.6	950	1,000
Sacramento	KFBK	275.1	1,090	100
San Diego	KFBC	247.8	1,210	100
Do	KFSD	440.9	680	500
San Francisco	KFRC	454.3	660	1,000
Do	KFWI	267.7	1,120	500
Do	KGTT	220.4	1,360	50
Do	KJBS	220.4	1,360	100
Do	KPO	422.3	710	1,000
Do	KYA	361.2	830	1,000
San Jose	KQW	296.9	1,010	500
San Pedro (Venice)	KFVD	215.7	1,390	250
Santa Ana	KWTC	272.6	1,100	100
Santa Barbara	KFCR	211.1	1,420	100
Santa Maria	KSMR	272.6	1,100	100
Santa Monica	KNRC	374.8	800	500
Stockton	KGDM	217.3	1,380	10
Do	KWG	344.6	870	50
COLORADO:				
Belleview College (Denver)	KPOF	201.2	1,490	500
Colorado Springs	KFUM	483.6	620	1,000
Denver	KFEL	227.1	1,320	250
Do	KFUP	227.1	1,320	100
Do	KFXF	282.8	1,060	250
Dupont	KLZ	352.7	850	1,000
Denver (near)	KOW	218.8	1,370	250
Denver	KOA	325.9	920	5,000
Edgewater (near)	KFXJ	209.7	1,430	50
Fort Morgan	KGEW	218.8	1,370	[1] 100 [2] 200
Greeley	KFKA	249.9	1,200	[1] 500 [2] 1,000
Gunnison	KFHA	249.9	1,200	50
Pueblo	KGDP	223.7	1,340	10
Do	KGHA	209.7	1,430	500
Do	KGHF	209.7	1,430	250
Yuma	KGEK	263.0	1,140	10
CONNECTICUT:				
Danbury	WCWS	265.3	1,130	100
Easton	WICC	265.3	1,130	500
Mansfield	WCAC	535.4	560	500
Hartford	WTIC	535.4	560	500
New Haven	WDRC	282.8	1,060	500
DELAWARE: Wilmington	WDEL	296.9	1,010	100
DISTRICT OF COLUMBIA:				
Washington	WMAL	241.8	1,240	500
Do	WRC	468.5	640	500
Do	WRHF	322.4	930	150
FLORIDA:				
Clearwater	WSUN / WFLA	516.9	580	750
Gainesville	WRUF	202.6	1,480	5,000
Jacksonville	KJAX	340.7	880	1,000
Lakeland	WMBL	228.9	1,310	100
FLORIDA—Con.				
Miami	WQAM	384.4	780	750
Miami Beach	WIOD	247.8	1,210	1,000
Do	WMBF	384.4	780	500
Orlando	WDBO	288.3	1,040	[1] 500 [2] 1,000
Pensacola	WCOA	249.9	1,200	500
Sarasota	WJBB	238.0	1,260	250
Tampa	WQBA	238.0	1,260	250
Do	WDAE	267.7	1,120	500
Do	WMBR	252.0	1,190	100
GEORGIA:				
Atlanta	WGST	270.1	1,110	500
Do	WSB	475.9	630	1,000
Do	WTHS	227.1	1,320	200
Macon	WMAZ	270.1	1,110	500
Toccoa	WTFI	209.7	1,430	250
HAWAII:				
Honolulu	KGHB	227.0	1,320	250
Do	KGU	270.1	1,110	600
IDAHO:				
Boise	KFAU	285.5	1,050	[2] 12,000 [4] 24,000
Jerome	KFXD	204.0	1,470	[1] 15 [2] 50
Kellogg	KFEY	232.4	1,290	10
Pocatello	KSEI	333.1	900	250
ILLINOIS:				
Addison	WMBI	263.0	1,140	5,000
Atwood	WLBQ	218.8	1,370	25
Batavia	WORD	252.0	1,190	5,000
Carthage	WCAZ	249.9	1,200	50
Chicago	KFKX	526.0	570	2,500
Do	KYW	526.0	570	[1] 5,000 [2] 2,500
Do	WAAF	389.4	770	500
Do	WBCN	288.3	1,040	250
Do	WCFL	483.6	620	1,500
Do	WCRW	223.7	1,340	500
Do	WEBH	365.6	820	500
Do	WEDC	241.8	1,240	500
Do	WENR	288.3	1,040	500
Do	WFKB	223.7	1,340	500
Do	WGES	241.8	1,240	500
Do	WHFC	215.7	1,390	200
Do	WJBT	389.4	770	500
Do	WKBI	215.7	1,390	50
Do	WLTS	483.6	620	100
Do	WMAQ	447.5	670	1,000
Do	WPOC	223.7	1,340	500
Do	WQJ	447.5	670	500
Do	WSAX	204.0	1,470	100
Do	WSBC	232.4	1,290	500
Do	WWAE	227.1	1,320	500
Chicago Heights	WJBZ	208.2	1,440	100
Crete	WLS	344.6	870	5,000
Decatur	WBAO	267.7	1,120	100
Do	WJBL	212.6	1,410	250
Deerfield	WHT	305.9	980	5,000
Desplaines (near)	WIBO	305.9	980	5,000
East Wenona	WLBI	238.0	1,260	250
Elgin (Chicago)	WGN	416.4	720	15,000
Do	WLIB	416.4	720	500
Evanston	WEHS	215.7	1,390	100
Forest Park	WNBA	208.2	1,440	200
Galesburg	WFBZ	247.8	1,210	50
Do	WKBS	217.3	1,380	100
Do	WLBO	217.3	1,380	100
Do	WRAM	247.8	1,210	50
Glenview	WBBM	389.4	770	5,000
Harrisburg	WEBQ	223.7	1,340	15
Homewood (Chicago)	WMBB / WOK	252.0	1,190	5,000

[1] Night. [2] Day.

Broadcasting stations of the United States, alphabetically, by States and cities—Con.

State and city	Call signal	Wave length (meters)	Frequency (kilocycles)	Power (watts)
ILLINOIS—Con.				
Joliet	WCLS	215.7	1,390	150
Do	WJBA	247.8	1,210	50
Do	WKBB	215.7	1,390	150
La Salle	WJBC	227.1	1,320	100
Mooseheart	WJJD	365.6	820	1,000
Mount Prospect	WJAZ	263.0	1,140	5,000
Peoria Heights	WMBD	205.4	1,460	250
Quincy	WTAD	236.1	1,270	[1] 1,250 [2] 500
Rockford	KFLV	267.7	1,120	100
Do	WLBR	322.4	930	15
Rock Island	WHBF	222.1	1,350	100
Springfield	WCBS	209.7	1,430	250
Streator	WTAX	247.8	1,210	50
Tuscola	WDZ	277.6	1,080	100
Urbana	WRM	272.6	1,100	500
Hanover Township (Villa Olivia)	WTAS	275.1	1,090	500
Waukegan	WPEP	215.7	1,390	250
Zion	WCBD	344.6	870	5,000
INDIANA:				
Anderson	WHBU	220.4	1,360	15
Brookville	WKBV	217.3	1,380	100
Crown Point	WLBT	247.8	1,210	50
Culver	WCMA	260.7	1,150	500
Evansville	WGBF	236.1	1,270	250
Fort Wayne	WCWK	214.2	1,400	250
Do	WOWO	228.9	1,310	[1] 2,500 [2] 5,000
Gary	WJKS	232.4	1,290	500
Indianapolis (near)	WFBM	275.1	1,090	1,000
Indianapolis	WKBF	252.0	1,190	250
Kokomo	WJAK	234.2	1,280	50
Laporte	WRAF	208.2	1,440	100
Muncie	WLBC	209.7	1,430	50
South Bend	WSBT	399.8	750	500
Terre Haute	WRPI	208.2	1,440	100
Valparaiso	WRBC	238.0	1,260	250
West Lafayette	WBAA	272.6	1,100	500
IOWA:				
Ames	WOI	265.3	1,130	[1] 2,500 [2] 5,000
Atlantic	KICK	322.4	930	100
Boone	KFGQ	209.7	1,430	10
Cedar Rapids	KWCR	239.9	1,250	250
Do	WJAM	239.9	1,250	250
Clarinda	KSO	227.1	1,320	500
Council Bluffs	KOIL	319.0	940	5,000
Davenport	WOC	374.8	800	5,000
Decorah	KGCA	247.8	1,210	10
Do	KWLC	247.8	1,210	50
Des Moines	WHO	535.4	560	5,000
Fort Dodge	KFJY	232.4	1,290	100
Iowa City	KGFB	223.7	1,340	10
Do	WSUI	475.9	630	500
Le Mars	KWUC	243.8	1,230	1,500
Marshalltown	KFJB	247.8	1,210	[1] 100 [2] 250
Muscatine	KPNP	211.1	1,420	100
Do	KTNT	256.3	1,170	2,000
Oskaloosa	KFHL	212.6	1,410	10
Ottumwa	WIAS	322.4	930	100
Shenandoah	KFNF	461.3	650	2,000
Do	KMA	394.5	760	1,000
Sioux City	KFMR	232.4	1,290	100
Do	KSCJ	243.8	1,230	[1] 500 [2] 1,000
KANSAS:				
Concordia	KGCN	208.2	1,440	50
Independence	KFVG	225.4	1,330	50
Lawrence	KFKU	254.1	1,180	500
Do	WREN	254.1	1,180	750
Manhattan	KSAC	333.1	900	500
KANSAS—Con				
Milford	KFKB	241.8	1,240	[1] 1,500 [2] 2,500
Topeka	WIBW	204.0	1,470	250
Wichita	KFH	245.8	1,220	500
KENTUCKY:				
Hopkinsville	WFIW	260.7	1,150	[1] 750 [2] 1,000
Louisville	WLAP	267.7	1,120	[1] 30 [2] 100
Do	WHAS	322.4	930	500
LOUISIANA:				
Cedar Grove	KGGH	212.6	1,410	50
Kennonwood	KWKH	394.5	760	1,000
New Orleans	WABZ	238.0	1,260	50
Do	WCBE	227.1	1,320	5
Do	WJBO	263.0	1,140	100
Do	WJBW	238.0	1,260	30
Do	WKBT	252.0	1,190	50
Do	WSMB	296.9	1,010	750
Do	WWL	245.8	1,220	500
Shreveport	KFDX	236.1	1,270	250
Do	KRAC	220.4	1,360	50
Do	KWEA	212.6	1,410	250
Do	KSBA	267.7	1,120	1,000
MAINE:				
Bangor	WABI	389.4	770	100
Dover-Foxcroft	WLBZ	208.2	1,440	250
Portland	WCSH	365.6	820	500
MARYLAND:				
Baltimore	WCAO	243.8	1,230	250
Do	WCBM	225.4	1,330	100
Do	WFBR	243.8	1,230	[1] 1,250 [2] 500
Glen Morris (near)	WBAL	285.5	1,050	5,000
Takoma Park	WBES	265.3	1,130	100
MASSACHUSETTS:				
Boston	WBIS WNAC	461.3	650	500
Do	WBZA	333.1	900	500
Do	WEEI	508.2	590	500
Do	WMES	211.1	1,420	50
Do	WSSH	288.3	1,040	100
Cambridge	WLBM	230.6	1,300	50
Chelsea	WLOE	211.1	1,420	100
Dartmouth	WMAF	428.3	700	500
Fall River	WSAR	212.6	1,410	250
Gloucester	WEPS	296.9	1,010	100
Lexington	WLEX	215.7	1,390	50
Medford	WBET	288.3	1,040	500
New Bedford	WNBH	260.7	1,150	250
Quincy	WRES	217.3	1,380	50
Springfield	WBZ	333.1	900	15,000
Taunton	WAIT	214.2	1,400	10
Webster	WKBE	228.9	1,310	100
Wellesley Hills	WBSO	384.4	780	100
Worcester	WTAG	516.9	580	250
MICHIGAN:				
Battle Creek	WKBP	212.6	1,410	50
Bay City	WSKC	272.6	1,100	250
Berrien Springs	WEMC	483.6	620	1,000
Detroit	WAFD	280.6	1,300	100
Do	WBMH	211.1	1,420	100
Do	WMBC	243.8	1,230	100
Do	WWJ	352.7	850	1,000
East Lansing	WKAR	277.6	1,080	[1] 500 [2] 1,000
Escanaba	WRAK	282.8	1,060	50
Flint	WFDF	272.6	1,100	100
Fraser	WGHP	319.0	940	750
Furnwood	WOOD	260.7	1,150	500
Grand Rapids	WASH	256.3	1,170	250
Iron Mountain	WLBY	209.7	1,430	50
Lapeer	WMPC	234.2	1,280	30
Ludington	WKBZ	199.9	1,500	15
Monroe	WKBL	205.4	1,460	15

[1] Night. [2] Day.

Broadcasting stations of the United States, alphabetically, by States and cities—Con.

State and city	Call signal	Wave length (meters)	Frequency (kilocycles)	Power (watts)
MICHIGAN—Con.				
Petoskey	WBBP	239.9	1,250	100
Pontiac	WCX / WJR	440.9	680	5,000
Royal Oak	WAGM	225.4	1,330	50
Saginaw	WMCO	272.6	1,100	250
Ypsilanti	WJBK	220.4	1,360	15
MINNESOTA:				
Barrett	KGDE	205.4	1,460	50
Collegeville	WFBJ	272.6	1,100	100
Fridley (Minneapolis).	WRHM	260.7	1,150	1,000
Hallock	KGFK	223.7	1,340	50
Minneapolis	KFDZ	215.7	1,390	10
Do	KGEQ	204.0	1,470	50
Do	WAMD	222.1	1,350	500
Do	WDGY	285.5	1,050	500
Do	WHDI	245.8	1,220	500
Do	WLB	245.8	1,220	500
Northfield	KFMX	236.1	1,270	500
Do	WCAL	285.5	1,050	500
St. Cloud	WFAM	252.0	1,190	10
St. Paul-Minneapolis (Anoka).	WCCO	405.2	740	[15,000 / 27,500]
St. Paul-Minneapolis.	WGMS[3]	245.8	1,220	500
Slayton	KGHC	209.7	1,430	15
Westcott	KSTP	220.4	1,360	2,000
White Bear Lake	WMBE	208.2	1,440	10
MISSISSIPPI:				
Columbus	WCOC	230.6	1,300	250
Gulfport	WQCM	222.1	1,350	15
Utica	WQBC	215.7	1,390	225
MISSOURI:				
Cape Girardeau	KFVS	223.7	1,340	50
Carterville	KFPW	263.0	1,140	50
Clayton	KFUO	545.1	550	[1,000 / 21,500]
Columbia	KFRU	249.9	1,200	500
Independence	KMBC / KLDS	270.1	1,110	1,500
Jefferson	WOS	422.3	710	500
Joplin	WMBH	204.0	1,470	100
Kansas City	KWKC	222.1	1,350	100
Do	WDAF	370.2	810	1,000
Do	WHB	340.7	880	500
Do	WLBF	200.7	1,430	50
Do	WOQ	340.7	880	500
Kirksville	KFKZ	225.4	1,330	15
Kirkwood	KMOX	299.8	1,000	5,000
St. Joseph	KFEQ	230.6	1,300	[1,000 / 2,000]
Do	KGBX	288.3	1,040	100
St. Louis	KFQA	234.2	1,280	50
Do	KWK	234.2	1,280	[1,000 / 2,000]
Do	KFWF	214.2	1,400	250
Do	KSD	545.1	550	500
Do	WEW	352.7	850	1,000
Do	WIL	258.5	1,160	250
Do	WMAY	234.2	1,280	100
Do	WSBF	258.5	1,160	250
MONTANA:				
Hardin	KGHP	263.0	1,140	50
Havre	KFBB	275.1	1,090	50
Kalispell	KGEZ	293.9	1,020	100
Missoula	KUOM	461.3	650	500
Vida	KGCX	243.8	1,230	10
NEBRASKA:				
Central City	KGES	204.0	1,470	10
Clay Center	KMMJ	285.5	1,050	[1 250 / 2 500]
Columbus	KGBY	222.1	1,350	50
Grand Island	KGEO	205.4	1,460	100
Humboldt	KGDW	293.9	1,020	100
NEBRASKA—Con.				
Lincoln	KFAB	319.0	940	5,000
Do	KFOR	217.3	1,380	100
Lincoln (University Place).	WCAJ	379.5	790	500
Norfolk	WJAG	285.5	1,050	[1 250 / 2 500]
Omaha	KFOX	258.5	1,160	100
Do	KOCH	258.5	1,160	250
Do	WAAW	440.9	680	500
Do	WNAL	258.5	1,160	250
Do	WOW	508.2	590	1,000
Ravenna	KGFW	296.9	1,010	10
Wayne	KGCH	293.9	1,020	250
York	KGBZ	212.6	1,410	100
NEW HAMPSHIRE:				
Laconia	WKAV	223.7	1,340	50
Tilton	WBRL	232.4	1,290	500
NEW JERSEY:				
Asbury Park	WCAP	239.9	1,250	500
Atlantic City	WPG	272.6	1,100	5,000
Bound Brook	WJZ	454.3	660	30,000
Camden	WCAM	223.7	1,340	500
Carlstadt	WHAP	236.1	1,270	1,000
Cliffside	WCDA / WBRS	211.1	1,420	250
Do	WPAP	394.5	760	500
Do	WQAO	394.5	760	500
Coytesville	WRNY	325.9	920	500
Elizabeth	WIBS	204.0	1,470	250
Englewood Cliffs	WHPP	206.8	1,450	10
Hoboken	WMCA	370.2	810	500
Do	WPCH	325.9	920	500
Jersey City	WAAT	245.8	1,220	300
Do	WKBO	218.8	1,370	500
Kearny	WLWL	370.2	810	5,000
Do	WOR	422.3	710	5,000
Midland Park	WTRL	206.8	1,450	15
Newark	WAAM	267.7	1,120	250
Do	WGCP	267.7	1,120	250
Do	WNJ	267.7	1,120	250
North Plainfield	WEAM	263.0	1,140	250
Paterson	WODA	293.9	1,020	1,000
Red Bank	WJBI	263.0	1,140	250
Secaucus	WGL	293.9	1,020	1,000
Trenton	WOAX	239.9	1,250	500
Union City	WBMS	199.9	1,500	100
NEW MEXICO:				
Raton	KGFL	222.1	1,350	50
State College	KOB	394.5	760	[15,000 / 27,500]
NEW YORK:				
Amherst	WKEN	204.0	1,470	750
Astoria	WGBS	348.6	860	500
Auburn	WMBO	220.4	1,360	100
Bay Shore	WRST	211.1	1,420	150
Bellmore	WEAF	491.5	610	50,000
Brooklyn	WBBC	227.1	1,320	500
Do	WBKN	199.9	1,500	100
Do	WLTH	256.3	1,170	250
Do	WMBQ	204.0	1,470	100
Do	WSGH / WSDA	227.1	1,320	500
Buffalo	WEBR	241.8	1,240	200
Do	WGR	302.8	990	750
Do	WKBW	217.3	1,380	[1 500 / 2 750]
Do	WSVS	204.0	1,470	50
Canton	WCAD	243.8	1,230	[1 500 / 21,000]
Cazenovia	WMAC	225.4	1,330	500
Coney Island (Sea Gate).	WCGU	218.8	1,370	500
Endicott	WNBF	206.8	1,450	50
Farmingdale	WLBH	232.4	1,290	30

[1] Night. [2] Day. [3] Call used when operating through WLB.

Broadcasting stations of the United States, alphabetically, by States and cities—Con.

State and city	Call signal	Wave length (meters)	Frequency (kilocycles)	Power (watts)
NEW YORK—Con.				
Flushing	WGOP	199.9	1,500	100
Freeport	WGBB	245.8	1,220	400
Ithaca	WLCI	247.8	1,210	50
Jamaica	WMRJ	206.8	1,450	10
Jamestown	WOCL	223.7	1,340	25
Long Island City	WLBX	204.0	1,470	250
New York	WBNY	236.1	1,270	500
Do	WEAF	491.5	610	5,000
Do	WEBJ	256.3	1,170	500
Do	WHN	394.5	760	500
Do	WKBQ	218.8	1,370	500
Do	WNYC	526.0	570	500
Do	WMSG	236.1	1,270	500
Peekskill	WOKO	215.7	1,390	250
Richmond Hill	WABC	309.1	970	[1] 2,500 [2] 5,000
Do	WBOQ	309.1	970	500
Rochester	WHEC WABO	254.1	1,180	[1] 250 [2] 500
Do	WNBQ	205.4	1,460	15
Do	WOKT	209.7	1,430	500
Rossville	WBRR	256.3	1,170	1,000
Saranac Lake	WNBZ	232.4	1,290	10
Schenectady	WGY	379.5	790	50,000
Syracuse	WFBL	258.5	1,160	750
Do	WSYR	293.9	1,020	500
Tonawanda	WMAK	545.1	550	750
Troy	WHAZ	305.9	980	500
Utica	WIBX	238.0	1,260	[1] 150 [2] 300
Victor Township	WHAM	280.2	1,070	5,000
Woodhaven	WEVD	245.8	1,220	500
Woodside	WWRL	199.9	1,500	100
NORTH CAROLINA:				
Asheville	WWNC	296.9	1,010	1,000
Charlotte	WBT	258.5	1,160	[1] 1,750 [2] 1,000
Greensboro	WNRO	223.7	1,340	250
Raleigh	WPTF	545.1	500	500
NORTH DAKOTA:				
Aneta	KGFN	199.9	1,500	15
Bismarck	KFYR	249.9	1,200	[1] 250 [2] 500
Devils Lake	KDLR	230.6	1,300	15
Fargo	WDAY	545.1	550	[1] 250 [2] 500
Grand Forks	KFJM	333.1	900	100
Mandan	KGCU	239.9	1,250	100
OHIO:				
Akron	WADC	238.0	1,260	1,000
Do	WFJC	227.1	1,320	500
Ashtabula	WJPW	208.2	1,440	30
Bellefontaine	WHBD	222.1	1,350	100
Cambridge	WEBE	247.8	1,210	10
Canton	WHBC	236.1	1,270	10
Cincinnati	WAAD	230.6	1,300	25
Do	WFBE	245.8	1,220	250
Do	WKRC	245.8	1,220	500
Cleveland	WEAR	399.8	750	1,000
Do	WHK	265.3	1,130	[1] 500 [2] 1,000
Do	WJAY	227.1	1,320	500
Do	WTAM	399.8	750	[1] 3,500 [2] 5,000
Columbus	WAIU	282.8	1,060	5,000
Do	WCAH	234.2	1,280	250
Do	WEAO	282.8	1,060	750
Do	WMAN	234.2	1,280	50
Dayton	WSMK	296.9	1,010	200
Hamilton	WRK	205.4	1,460	100
Middletown	WSRO	236.1	1,270	100
Harrison	WLW	428.3	700	5,000
Mansfield	WLBV	206.8	1,450	50
Mason	WSAI	361.2	830	5,000
Springfield	WCSO	256.3	1,170	500
OHIO—Continued.				
Steubenville	WIBR	249.9	1,200	50
Toledo	WSPD	239.9	1,250	250
Wooster	WABW	247.8	1,210	50
Youngstown	WKBN	214.2	1,400	50
Do	WMBW	214.2	1,400	50
OKLAHOMA:				
Alva	KGFF	205.4	1,460	25
Bristow	KVOO	348.6	860	1,000
Chickasha	KOOW	252	1,190	250
Norman	WNAD	239.9	1,250	500
Oklahoma City	KFJF	272.6	1,100	[1] 1,750 [2] 1,000
Do	KFXR	223.7	1,340	50
Do	KGCB	215.7	1,390	50
Do	KGFG	215.7	1,390	50
Do	WKY	288.3	1,040	150
Picher	KGGF	206.8	1,450	100
OREGON:				
Astoria	KFJI	249.9	1,200	15
Corvallis	KOAC	270.1	1,110	500
Eugene	KOOS	201.2	1,490	50
Medford	KMED	270.1	1,110	50
Portland	KEX	277.6	1,080	2,500
Do	KFEC	214.2	1,400	50
Do	KFIF	228.9	1,310	50
Do	KFJR	239.9	1,250	500
Do	KGW	491.5	610	1,000
Do	KLIT	199.9	1,500	10
Do	KTBR	228.9	1,310	50
Do	KWBS	199.9	1,500	15
Do	KWJJ	249.9	1,200	50
Do	KXL	220.4	1,360	100
Sylvan	KOIN	319.0	940	1,000
PENNSYLVANIA:				
Allentown	WCBA	222.1	1,350	100
Do	WSAN	222.1	1,350	100
Altoona	WFBG	267.7	1,120	100
Carbondale	WNBW	199.9	1,500	5
Elkins Park	WIBG	440.9	680	50
East Pittsburgh	KDKA	315.6	950	50,000
Grove City	WSAJ	223.7	1,340	250
Harrisburg	WBAK	299.8	1,000	500
Do	WPRC	209.7	1,430	100
Jeannette	WGM	208.2	1,440	50
Johnstown	WHBP	228.9	1,310	[1] 250 [2] 500
Kingston (Pringleboro).	WABF	205.4	1,460	250
Lancaster	WGAL	252.0	1,190	15
Do	WKJC	252.0	1,190	50
Lemoyne	WMBS	234.2	1,280	250
Lewisburg	WJBU	214.2	1,400	100
McKeesport	WMBJ	232.4	1,290	50
Oil City	WHBA	260.7	1,150	10
Do	WLBW	293.9	1,020	500
Philadelphia	WFAN	223.7	1,340	500
Do	WABY	247.8	1,210	50
Do	WCAU	260.7	1,150	500
Do	WFI	405.2	740	500
Do	WFKD	247.8	1,210	50
Do	WHBW	220.4	1,360	100
Do	WIAD	288.3	1,040	100
Do	WIP	348.6	860	500
Do	WLIT	405.2	740	500
Do	WNAT	288.3	1,040	100
Do	WOO	348.6	860	500
Do	WPSW	206.8	1,450	50
Do	WRAX	212.6	1,410	250
Pittsburgh	KQV	270.1	1,110	500
Do	WCAE	461.3	650	500
Do	WJAS	270.1	1,110	500
Reading	WRAW	238.0	1,260	100
Scranton	WGBI	230.6	1,300	250
Do	WQAN	230.6	1,300	250
State College	WPSC	299.8	1,000	500

[1] Night. [2] Day.

Broadcasting stations of the United States, alphabetically, by States and cities—Con.

State and city	Call signal	Wave length (meters)	Frequency (kilocycles)	Power (watts)
PENNSYLVANIA—Continued.				
Washington	WNBO	211.1	1,420	15
Wilkes-Barre	WBAX	249.9	1,200	100
Do	WBRE	249.9	1,200	100
Willow Grove	WALK	201.2	1,490	50
PHILIPPINE ISLANDS:				
Manila	KZIB	249.9	1,200	20
Do	KZKZ	270.1	1,110	100
Do	KZRQ	399.8	750	500
PORTO RICO:				
San Juan	WKAQ	322.4	930	500
RHODE ISLAND:				
Cranston	WDWF / WLSI	247.8	1,210	250
Pawtucket	WFCI	241.8	1,240	100
Providence	WCOT	225.4	1,330	100
Do	WEAN	275.1	1,090	500
Do	WJAR	483.6	620	500
Do	WRAH	199.9	1,500	250
SOUTH CAROLINA:				
Charleston	WBBY	249.9	1,200	75
SOUTH DAKOTA:				
Brookings	KFDY	545.1	550	500
Do	KGCR	208.2	1,440	15
Dell Rapids	KGDA	254.1	1,180	15
Oldham	KGDY	206.8	1,450	15
Pierre	KGFX	254.1	1,180	200
Rapid City	WCAT	247.8	1,210	100
Sioux Falls	KSOO	209.7	1,430	[1] 250 / [2] 500
Vermilion	KUSD	483.6	620	250
Yankton	WNAX	302.8	990	1,000
TENNESSEE:				
Chattanooga	WDOD	243.8	1,230	500
Knoxville	WFBC	234.2	1,280	50
Do	WNBJ	206.8	1,450	50
Do	WNOX	265.3	1,130	1,000
Lawrenceburg	WOAN	239.9	1,250	500
Memphis	WGBC	228.9	1,310	15
Do	WHBQ	232.4	1,290	100
Do	WMBM	209.7	1,430	10
Do	WMC	516.9	580	500
Do	WNBR	228.9	1,310	100
Nashville	WBAW	239.9	1,250	500
Do	WLAC / WDAD	225.4	1,330	1,000
Do	WSM	336.9	890	5,000
Springfield	WSIX	249.9	1,200	150
Union City	WOBT	205.4	1,460	15
Whitehaven (Memphis)	WREC	249.9	1,200	100
TEXAS:				
Amarillo	KGRS	243.8	1,230	[1] 250 / [2] 500
Do	WDAG	263.0	1,140	250
Austin	KUT	232.4	1,290	500
Beaumont	KFDM	483.6	620	500
Breckenridge	KFYO	211.1	1,420	15
Brownsville	KWWG	277.6	1,080	500
College Station	WTAW	483.6	620	500
Dallas	KRLD	461.3	650	500
Do	WFAA	545.1	550	500
Do	WRR	461.3	650	500
Dublin	KFPL	275.1	1,090	15
El Paso	WDAH	234.2	1,280	100
Fort Worth	KFJZ	249.9	1,200	50
Do	WBAP	499.7	600	5,000
Do	KFQB	333.1	900	1,000
Galveston	KFLX	270.1	1,110	100
Do	KFUL	258.5	1,160	500
Greenville	KFPM	230.6	1,300	15
Harlingen	KHMC	236.1	1,270	100
Houston	KFVI	238.0	1,260	50
Do	KPRC	293.9	1,020	500
Do	KTUE	212.6	1,410	5
TEXAS—Continued.				
San Angelo	KGFI	220.4	1,360	15
San Antonio	KGCI	220.4	1,360	100
Do	KGDR	206.8	1,450	15
Do	KGRC	220.4	1,360	100
Do	KTAP	228.9	1,310	20
Do	KTSA	265.3	1,130	2,000
Do	WOAI	499.7	600	5,000
Waco	WJAD	333.1	900	500
UTAH:				
Ogden	KFUR	225.4	1,330	50
Salt Lake City	KDYL	234.2	1,280	500
Do	KFUT	249.9	1,200	50
Do	KSL	302.8	990	1,000
VERMONT:				
Burlington	WCAX	254.1	1,180	100
Springfield	WNBX	241.8	1,240	10
VIRGINIA:				
Arlington	NAA	434.5	690	1,000
Mount Vernon Hills	WTFF	202.6	1,480	10,000
Norfolk	WBBW	236.1	1,270	100
Do	WTAR / WPOR	236.1	1,270	500
Do	WIVA	209.7	1,430	100
Petersburg	WLBG	214.2	1,400	100
Portsmouth	WSEA	263.1	1,140	500
Richmond	WBBL	234.2	1,280	100
Do	WMBG	220.4	1,360	15
Do	WRVA	254.1	1,180	1,000
Do	WTAZ	220.4	1,360	15
Roanoke	WDBJ	230.6	1,300	250
WASHINGTON:				
Aberdeen	KXRO	223.7	1,340	50
Bellingham	KVOS	209.7	1,430	250
Everett	KFBL	223.7	1,340	50
Lacey	KGY	245.8	1,220	50
Pullman	KWSC	394.5	760	500
Seattle	KFOA	447.5	670	1,000
Do	KFQW	217.3	1,380	100
Do	KVL	202.6	1,480	100
Do	KGCL	230.6	1,300	100
Do	KJR	348.6	860	2,500
Do	KKP	202.6	1,480	15
Do	KOMO	309.1	970	1,000
Do	KPCB	230.6	1,300	100
Do	KRSC	202.6	1,480	50
Do	KXA	348.6	860	500
Do	KTW	394.5	760	1,000
Do	KUJ	199.9	1,500	10
Spokane	KFIO	245.8	1,220	100
Do	KFPY	245.8	1,220	250
Do	KGA	260.7	1,150	2,000
Do	KHQ	370.2	810	1,000
Tacoma	KMO	254.1	1,180	500
Do	KVI	282.8	1,060	250
WEST VIRGINIA:				
Charleston	WOBU	267.7	1,120	50
Clarksburg	WQBJ	239.9	1,250	50
Huntington	WSAZ	249.9	1,200	100
Weirton	WQBZ	249.9	1,200	60
Wheeling	WWVA	516.9	580	250
WISCONSIN:				
Appleton	WAIZ	227.1	1,320	100
Beloit	WEBW	258.5	1,160	500
Brookfield	WTMJ	293.9	1,020	1,000
Eau Claire	WTAQ	254.1	1,180	500
Fond du Lac	KFIZ	267.7	1,120	100
Kenosha	WCLO	227.1	1,320	100
Do	WKDR	247.8	1,210	15
La Crosse	WKBH	220.4	1,360	500
Madison	WHA	333.1	900	750
Do	WIBA	239.9	1,250	100
Manitowoc	WOMT	222.1	1,350	100

[1] Night. [2] Day.

Broadcasting stations of the United States alphabetically by States and cities—Con.

State and city	Call signal	Wave length (meters)	Frequency (kilocycles)	Power (watts)
WISCONSIN—Con.				
Milwaukee	WGWB	270.1	1,110	250
Do	WHAD	270.1	1,110	500
Do	WISN	270.1	1,110	250
Poynette	WIBU	217.3	1,380	20
Racine	WRRS	247.8	1,210	50
Sheboygan	WHBL	204.0	1,470	[1] 250 / [2] 500
Stevens Point	WLBL	333.1	900	[1] 1,000 / [2] 2,000
Superior	WEBC	241.8	1,240	[1] 250 / [2] 1,000
West De Pere	WHBY	249.9	1,200	50
WYOMING: Laramie	KFBU	483.6	620	500
PORTABLE:				
Airplane	KFBI	204.0	1,470	50
Inglewood, Calif.	KGGM	204.0	1,470	100
PORTABLE—Con.				
Los Angeles, Calif.	KGFO	204.0	1,470	100
Chicago, Ill.	WBBZ	204.0	1,470	100
Do	WHBM	201.2	1,490	100
Do	WIBJ	201.2	1,490	100
Do	WIBM	201.2	1,490	100
Do	WKBG	201.2	1,490	100
Do	WLBN	204.0	1,470	50
Boston, Mass.	WATT	201.2	1,490	100
MU-1 (yacht)	WRMU	201.2	1,490	100
Richmond Hill, N. Y.	WGMU	201.2	1,490	100
Newport, R. I.	WMBA	204.0	1,470	100
Providence, R. I.	WCBR	201.2	1,490	100
Shelby, Ohio	WOBR	204.0	1,470	10

[1] Night. [2] Day.

NOTE.—Construction permits have been issued for changes in wave lengths, power, location, etc., of some of these stations; however ,new data pertaining thereto will not be published until new station licenses have been issued.

Broadcasting stations using 200 watts power or more, in the Eastern Hemisphere, in order of wave lengths

Wave length (meters)	Frequency (kilocycles)	Power (watts)	Location	Call signal
4,000	75	8,000	Berlin (Koenigswusterhausen)	AFP
2,900	103			
2,650	113	5,000	Paris (Eiffel Tower)	FL
2,525	119		Berlin (Wolff's Bureau)	
2,000	150	15,000	Kovno, Lithuania	
1,950	154	2,500	Scheveningen Haven, Holland	
1,870	160	5,000	Kosice, Czechoslovakia	
1,850	162	5,000	Carthage (Radio Tunis)	TNV
1,840	163	4,000		
1,950	154		Huizen, Holland	
1,829	164		Norddeich, Germany	
1,800	167	6,000	Angora, Turkey	
1,750	171	3,000	Paris (Radio-Paris)	CFR
1,604.8	187	25,000	Daventry, England	5XX
1,320	227	30,000	Motala, Sweden	
1,250	240	35,000	Berlin (Koenigswusterhausen) (Zeesen)	AFT
1,250	240	5,000	Perth, Australia	6WF
1,200	250	6,000	Osmanieh, Turkey	
1,200	250	1,000	Boden, Sweden	SASE
1,180	254	15,000	Stamboul, Turkey	
1,153.8	260	7,000	Kalundborg, Denmark	
1,150	261	1,000	Ryvang, Denmark	
1,111.1	270	10,000	Warsaw, Poland	
1,110	270	1,000	Kbely, Czechoslovakia	
1,100	273	250	Basle, Switzerland	
1,100	273		De Bilt, Holland	
1,069	280.5	5,000	Hilversum, Holland	ANRO
800	375	1,750	Colombo, Ceylon	
800	375	1,500	Hong Kong, China	VPS3
760	395	500	Geneva (Radio-Geneva)	
720	416	2,000	Ostersund, Sweden	
680	441	600	Lausanne, Switzerland	HB2
588.2	510	2,000	Zurich, Switzerland	
576	520	750	Vienna (Stubenring)	ORV
573.6	523	750	Freiburg, Germany	
566	530	1,500	Augsburg, Germany	
566	530		St. Michel, Finland	
566	530	700	Hamar, Norway	
566	530	1,500	Krakow, Poland	

Broadcasting stations using 200 watts power or more, in the Eastern Hemisphere, in order of wave lengths—Continued

Wave length (meters)	Frequency (kilocycles)	Power (watts)	Location	Call signal
555.6	540	3,000	Budapest, Hungary	MTI
545.6	550	1,000	Sundsvall, Sweden	SASD
541	554	7,000	Milan, Italy	
535.7	560	4,000	Munich, Germany	
526.5	570	2,000	Riga, Latvia	KCX
524	572	1,000	Porsgrund, Norway	
517.2	580	5,000	Vienna (Rosenhugel)	
508.5	590	1,500	Brussels, Belgium	BAV
500	600	1,500	Aberdeen, Scotland	2BD
500	600	250	Uppsala, Sweden	
500	600	250	Linkoping, Sweden	
491.8	610	25,000	Daventry, England (experimental)	5GB
483.9	620	4,000	Berlin (Witzleben)	
481	620	3,000	Melbourne, Australia	3AR
480	625	500	Tientsin, China	XOL
477.7	628	1,000	Lyons, France (La Doua)	YN
470	638	25,000	Langenberg, Germany	
463	647	750	Dunedin, New Zealand	4YA
462	649	1,000	Barcelona, Spain (Radio Catalana)	EAJ13
461.5	650	1,500	Oslo, Norway	
458	655	500	Paris (Ecole Superieure)	
454.5	660	1,500	Stockholm, Sweden	SASA
451	665	3,000	Rome, Italy	1RO
443.5	676	500	Johannesburg, South Africa	
443.2	676.8	3,000	Brunn, Czechoslovakia	OKB
442	678	5,000	Sydney, Australia	2FC
435	689	500	Wilno, Poland	
434.8	690	2,000	Seville, Spain (Union Radio)	EAJ5
434.8	690	700	Fredriksstad, Norway	
428.6	700	4,000	Frankfort-on-Main, Germany	
425	705.5	2,000	Mukden, China	COMK
423	709	700	Notodden, Norway	
422	710	10,000	Kattowitz, Poland	
420	714	5,000	Wellington, New Zealand	2YA
416.7	720	1,000	Goteborg, Sweden	SASB
411	730	1,500	Berne, Switzerland	
408	735	2,200	Tallinn (Reval), Estonia	
405.4	740	1,500	Glasgow, Scotland	5SC
405	741	1,000	Salamanca, Spain	EAJ22
401	748	750	Aix-la-Chapelle, Germany	
400	750	1,500	Durban, South Africa	
400	750	500	Cadiz, Spain	EAJ3
400	750	4,000	Mont de Marsan, France	
400	750	500	Madrid, Spain (Radio Espana)	EAJ2
400	750	1,500	Cork, Irish Free State	6CK
400	750	200	Plymouth, England	5PY
400	750	250	Tammerfors, Finland	
400	750	500	Bilbao, Spain	EAJ9
396	757	4,000	Hamburg, Germany	
395	759	5,000	Adelaide, Australia	5CL
391	767	3,000	Toulouse, France	
390	769	5,000	Dairen (Kwantung), China	JQAK
385	779	5,000	Brisbane, Australia	4QG
385	779	1,000	Osaka, Japan	JOBK
384.6	780	1,500	Manchester, England	2ZY
380.7	788	4,000	Stuttgart, Germany	
375.9	798	1,200	Helsingfors, Finland	
375	800	1,500	Madrid, Spain (Union Radio)	EAJ7
375	800	1,000	Tokyo, Japan	JOAK
375	800	1,500	Cape Town, Africa	
371	808	5,000	Melbourne, Australia	3LO
370.4	810	1,500	Bergen, Norway	
370.4	810	3,000	Calcutta, India	7CA
370	811	500	Paris (Radio LL)	
367	817		Kyoto, Japan	JOOK
366.3	819	4,000	Leipzig, Germany	
361.4	830	3,000	London, England	2LO
360	833	1,500	Nagoya, Japan	JOCK
358	850	5,000	Sydney, Australia	2BL
357.1	840	3,000	Bombay, India	7BY
357.1	840	500	Graz, Austria	
355	845	2,000	Falun, Sweden	
353	850	1,500	Cardiff, Wales	5WA
350	857	200	Las Palmas, Canary Islands	EAR5
350	857	350	Rangoon, Burma	2HZ
348.9	860	5,000	Prague, Czechoslovakia	OKP
345	869	1,000	Seoul, Chosen	JODK
344.8	870	1,500	Barcelona, Spain	EAJ1
342.8	875	1,500	Posen, Poland	

Broadcasting stations using 200 watts power or more, in the Eastern Hemisphere, in order of wave lengths—Continued

Wave length (meters)	Frequency (kilocycles)	Power (watts)	Location	Call signal
340.9	880	500	Paris (Petit Parisien)	
337	890	1,000	Copenhagen, Denmark	
335	895	500	San Sebastian, Spain	EAJ8
335	895	1,000	Cartagena, Colombia	EAJ16
333.3	900	1,500	Naples, Italy	1NA
333.3	900	1,000	Reykjavik, Iceland	
333	901	500	Auckland, New Zealand	1YA
330.3	908	1,000	Koenigsberg, Germany	
326.1	920	1,500	Bournemouth, England	6BM
323.8	926	1,000	Almeria, Spain	EAJ18
322.6	930	4,000	Breslau, Germany	
319.1	940	1,500	Dublin, Ireland	2RN
318	943		Lahtis, Finland	
316	949	1,500	Milan, Italy	1MI
312.5	960	1,500	Newcastle, England	5NO
310	967	350	Zagreb, Yugoslavia	
310	967	2,000	Algiers, North Africa	
310	967	100	Oviedo, Spain	
309	970	500	Marseille, France	
306	980	1,500	Belfast, Ireland	2BE
306	980	500	Christchurch, New Zealand	3YA
305	984	2,500	Casablanca, Morocco	
304	986		Bjorneborg, Finland	
303	990	4,000	Nurnberg, Germany	
302	993	1,000	Paris (Radio Vitus)	
300	1,000	500	Bratislava, Czechoslovakia	OKR
297	1,010	250	Agen, France	
297	1,010	200	Liverpool, England	6LV
297	1,010	200	Varberg, Sweden	
297	1,010	200	Jyvaskyla, Finland	
297	1,010	700	Hanover, Germany	
295	1,016	500	Rennes, France	
294.1	1,020	200	Hull, England	6KH
294.1	1,020	200	Dundee, Scotland	2DE
294.1	1,020	200	Stoke, England	6ST
294.1	1,020	200	Swansea, England	5SX
294.1	1,020	250	Uddevalla, Sweden	
294.1	1,020	500	Innsbruck, Austria	
289	1,038	1,500	Lyons (Radio-Lyon)	
288.5	1,040	200	Edinburgh, Scotland	2EH
287.9	1,042	500	Lille, France	
283	1,060	4,000	Cologne, Germany	SMXQ
278.8	1,076	1,000	Trollhattan, Sweden	
278	1,079	1,000	Grenoble, France	
277.8	1,080	200	Leeds, England	2LS
275.2	1,090	700	Dresden, Germany	
275.2	1,090		Jacobstad, Finland	
275.2	1,090	200	Nottingham, England	5NG
275.2	1,090	250	Norrkoping, Sweden	SMVV
275	1,090	1,000	Bordeaux (Lafayette), France	
273	1,100		De Bilt, Holland	
273	1,100	250	Basel, Switzerland	
273	1,100	500	Limoges, France	
272.7	1,100	200	Sheffield, England	6FL
272.7	1,100	750	Danzig, Germany	
272.7	1,100	250	Hudiksvall, Sweden	
272.7	1,100	1,500	Klagenfurt, Austria	
272.7	1,100	700	Cassel, Germany	
267.8	1,120	500	Lisbon, Portugal	PIAA
260.9	1,150	1,000	Malmo, Sweden	SASC
259	1,160	500	Toulouse, France	
257	1,167	250	Juan les Pins, France	
256	1,172	700	Kiel, Germany	
254.2	1,180	250	Kalmar, Sweden	SMSD
252.1	1,190	200	Bradford, England	2LS
252.1	1,190	250	Montpellier, France	
252.1	1,190	750	Bremen, Germany	
252.1	1,190	500	Saffle, Sweden	
250	1,200	200	Las Palmas, Canary Islands	EAR5
250	1,200	250	Eskilstuna, Sweden	
250	1,200	700	Gleiwitz, Germany	
250	1,200	200	Uleaborg, Finland	
243.9	1,230		Trondhjem, Norway	
241.9	1,240	1,500	Muenster, Germany	
238.1	1,260	250	Kiruna, Sweden	
237	1,265	1,500	Bordeaux, France	
236.2	1,270	250	Orebro, Sweden	
235	1,276	750	Stettin, Germany	
230.2	1,303	1,000	Boras, Sweden	

Broadcasting stations using 200 watts power or more, in the Eastern Hemisphere, in order of wave lengths—Continued

Wave length (meters)	Frequency (kilocycles)	Power (watts)	Location	Call signal
229	1,310	250	Helsingborg, Sweden	
229	1,310	250	Umea, Sweden	
225.6	1,330	2,000	Belgrade, Serbia	
220.6	1,360	250	Karlstad, Sweden	
217.4	1,380	250	Luxemburg, Belgium	
215.8	1,390	250	Halmstad, Sweden	
214.3	1,400	700	Viborg, Finland	
204.1	1,470	250	Gavle, Sweden	SMXF
201.3	1,490	500	Jonkoping, Sweden	SMZD
200	1,500	250	Biarritz (Cote d'Argent), France	
196	1,530	250	Karlskrona, Sweden	SMSM
187.5	1,600	250	Ornskoldsvik	
158	1,899	500	Beziers, France	
140	2,143	500	Surabaya, Java	

Central and South American broadcasting stations using 500 watts power or more in order of wave lengths

Wave length (meters)	Frequency (kilocycles)	Power (watts)	Location	Call signal
482	622	500	Salvador, Salvador	AQM
425	705	1,000	La Plata, Argentina	LOP
400	750	1,000	Buenos Aires, Argentina	LOT
400	750	2,000	Rio de Janeiro, Brazil	SQAA
380	790	500	Mendoza, Argentina	LOU
380	790	500	Montevideo, Uruguay	CWOS
380	790	1,000	Buenos Aires, Argentina	LOX
375	800	1,000	Caracas, Venezuela	AYRE
365	821	1,000	Sao Paulo, Brazil	SQAG
361.5	830	1,000	Buenos Aires, Argentina	LOV
360	834	1,500	Lima, Peru	OAX
360	834	1,200	Santiago, Chile	CMAC
350	857	500	Montevideo, Uruguay	CWOR
345	869	1,500	Concepcion, Chile	CMAI
344.8	870	1,000	Buenos Aires, Argentina	LOR
330	909	1,000	do	LOZ
320	938	500	Rio de Janeiro, Brazil	SQAB
320	938	1,000	Santiago, Chile	CMAD
315.8	950	1,000	Buenos Aires, Argentina	LOY
308	990	1,000	do	LOW
291.2	1,030	5,000	do	LOS
270	1,111	1,000	do	LOJ
261	1,150	500	do	LOQ
252	1,190	1,000	do	LOO
226	1,270	2,000	do	LOL
225.4	1,330	1,000	Sao Paulo, Brazil	SQBO
210	1,429	5,000	Buenos Aires, Argentina	LON

Stations in the Eastern Hemisphere operating on short waves

Wave length (meters)	Frequency (kilocycles)	Location	Call signal
85	3,529	Zurich, Switzerland (Radio Club)	EH9XD
61	4,918	Paris, France (Radio LL)	8GC
56.7	5,291	Nauen, Germany	AGJ
50	6,000	Karlsborg, Sweden	
45	6,666	Rome, Italy	1AX
[1] 44.4	6,696	Vienna, Austria	
39.5	7,595	Lyon, France (Rhone)	
37.5	8,000	Ibarakiken, Japan	JHBB
37	8,108	Paris, France (Radio Vitus)	
32.9	9,118	Perth, Scotland	6AG
32	9,375	Zurich, Switzerland (Radio Club)	EH9XD
32	9,375	Melbourne, Australia	3LO
32	9,375	Johannesburg, South Africa	JB
32	9,375	Berne, Switzerland	EH9OC
32	9,375	Bandoeng, Java	ANE
[2] 31.5	9,523	Helsingfors, Finland	
30.2	9,934	Hilversum, Holland	PCJJ
30	10,000	Bergen, Norway	LGN
28.5	10,526	Sydney, Australia	2FC
[3] 24	12,500	Chelmsford, England	5SW
[1] 22.2	13,392	Vienna, Austria	
[4] 18	16,666	Kootwijk, Holland	PCLL
[5] 17	17,647	Bandoeng, Java (Malabar)	ANH
15.5	19,354	Nancy, France	

[1] Power, 240 watts.
[2] Power, 300 watts.
[3] Power, 15,000 watts.
[4] Power, 40,000 watts.
[5] Power, 30,000 watts.

BUREAU OF STANDARDS TESTS OF PIEZO OSCILLATORS

Tests of radio devices by the Bureau of Standards are necessarily limited to special tests for the Government, tests of instruments which are in turn used as standards for testing considerable numbers of other instruments, tests of importance to the bureau as a matter of research, and a few other tests for which special reasons arise.

The bureau has considered transmitting-station-frequency standards as in the latter class, because of the great importance of insuring that all stations be adjusted to the same frequency basis, and because no laboratories doing commercial testing for the public have had standards or experience such as to insure that their measurements would meet this requirement. The demand for the testing of station-frequency standards has increased to the point where the bureau can not meet the demand under its present appropriations and facilities. Pending the completion of testing at present on hand, the bureau must for the present put applications for test of station-frequency standards on a waiting list. Such tests may be made subsequently as circumstances permit. The bureau may eventually discontinue the testing of station-frequency standards entirely, but does not expect to do this until it is satisfied that commercial organizations can handle the work satisfactorily. In the meantime the bureau desires to assist such organizations to prepare to do such testing.

The only kind of radio-frequency standard at present commercially available which can be relied upon to an accuracy better than 0.1 per cent is the piezo oscillator. In the present state of development of this device, the Bureau of Standards finds that the standardization of each one is a research job rather than a routine test. This has necessitated an increase in the fees charged; the new fees are given below.

A quartz plate will not be tested unless it operates readily, is mounted in a suitable holder, and is accompanied by the piezo-oscillator circuits in which it is used.

Some quartz plates submitted are unsatisfactory for certification by reason of failure to operate, having one or more frequencies close to the desired frequency, or having a frequency outside the 1 per cent limit set by the bureau. In case this is ascertained before the complete procedure of adjusting the plate is carried through, schedule 163z applies; half of the regular fee is usually charged. In case the unsatisfactory condition does not appear until the adjustment procedure is completed, the entire fee will be charged. These fees will be charged independently of whether another plate is submitted later.

Item	Description	Fee
163a	Determination of one fundamental frequency of a piezo oscillator or resonator or quartz plate at room temperature	$15
163b	Determination of one fundamental frequency of a piezo oscillator or resonator or quartz plate provided with a suitable thermostat at a specified temperature above that of the laboratory	25
163c	Adjustment at room temperature to specified frequency of a quartz plate mounted in a holder provided with a simple mechanical adjustment for varying the frequency	20
163d	Adjustment at a specified temperature above that of the laboratory to specified frequency of a quartz plate provided with a suitable thermostat and mounted in a holder provided with a simple mechanical adjustment for varying the frequency	40
163e	Adjustment at room temperature to specified frequency of a quartz plate cut to approximate frequency (not more than 1 per cent below the specified frequency)	30
163f	Adjustment at a specified temperature above that of the laboratory to specified frequency of a quartz plate provided with a suitable thermostat and cut to approximate frequency (not more than 1 per cent below the specified frequency)	75
163z	For special tests not covered by the above schedule fees will be charged dependent upon the nature of the test	

CONSTANT FREQUENCY STATIONS

The monthly lists hitherto published under this heading will not be published in the future. These lists were useful heretofore in furnishing to the public information as to stations which had taken special precautions to insure operating on the assigned frequency. With the increased accuracy now required for station frequencies, the Bureau of Standards can not certify as to the accuracy of stations in the list without at least occasional measurements of the actual transmitted frequencies. On account of the demands on the bureau for testing and other urgent work requiring all the time of the bureau's limited radio staff, such measurements will not be possible. Actual standards of frequency are made available to the listening public by the monthly transmissions of standard frequency signals from the Bureau of Standards. A new schedule of these transmissions is published in this issue.

RADIO SIGNAL TRANSMISSIONS OF STANDARD FREQUENCY, APRIL TO OCTOBER

The Bureau of Standards announces a new schedule of radio signals of standard frequencies for use by the public in calibrating frequency standards and transmitting and receiving apparatus. The signals are transmitted from the bureau's station WWV, Washington, D. C. They can be heard and utilized by stations equipped for continuous-wave reception at distances up to about 500 to 1,000 miles from the transmitting station.

The transmissions are by continuous-wave radio telegraphy. The signals have a slight modulation of high pitch which aids in their identification. A complete frequency transmission includes a "general call" and "standard frequency" signal and "announcements." The "general call" is given at the beginning of the 8-minute period and continues for about 2 minutes. This includes a statement of the frequency. The "standard frequency signal" is a series of very long dashes with the call letter (WWV) intervening. This signal continues for about 4 minutes. The "announcements" are on the same frequency as the "standard frequency signal" just transmitted and contain a statement of the frequency. An announcement of the next frequency to be transmitted is then given. There is then a 4-minute interval while the transmitting set is adjusted for the next frequency.

Information on how to receive and utilize the signals is given in Bureau of Standards Letter Circular No. 171, which may be obtained by applying to the Bureau of Standards, Washington, D. C. Even though only a few frequency points are received, persons can obtain as complete a frequency meter calibration as desired by the method of generator harmonics, information on which is given in the letter circular. The schedule of standard frequency signals is as follows:

Radio signal transmissions of standard frequency (schedule of frequencies in kilocycles)

Eastern standard time	Apr. 20	May 21	June 20	July 20	Aug. 20	Sept. 20	Oct. 22
10 to 10.08 p. m.	3,000	650	1,500	3,000	125	300	650
10.12 to 10.20	3,300	750	1,650	3,300	150	350	750
10.24 to 10.32	3,600	860	1,800	3,600	175	400	850
10.36 to 10.44	4,000	950	2,000	4,000	200	450	950
10.48 to 10.56	4,400	1,050	2,250	4,400	225	500	1,050
11.00 to 11.08	4,900	1,200	2,500	4,900	250	550	1,200
11.12 to 11.20	5,400	1,350	2,750	5,400	275	600	1,350
11.24 to 11.32	6,000	1,500	3,000	6,000	300	650	1,500

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*

R090 Hawks, E. Pioneers of wireless (book). Published by Menthen & Co. (Ltd.), London, 1927, price 12 shillings 6 pence.
Historical account of the development of radio.

R100.—*Radio principles*

R113.1 de la Forge, L. Les mésures de fading (Measurements of fading). QST Français et Radioélectricité Réunis, **9**, pp. 16–27; February, 1928.
Translation into French of Bureau of Standards Scientific Papers No. 561, Cooperative Measurements of Radio Fading in 1925.

R113.4 Hulburt, E. O. Ionization in the upper atmosphere. Proc. Inst. Radio Engrs., **16**, pp. 174–76; February, 1928.
Radio experiments show that ultra-violet light rays are one cause of ionization.

R113.5 Maris, H. B. A theory of the upper atmosphere and meteors. Proc. Inst. Radio Engrs., **16**, pp. 177–80; February, 1928.
Radio experiments needed to determine conclusion concerning diurnal and seasonal changes in temperature and composition of atmosphere at heights greater than 50 kilometers.

R113.5 Austin, L. W., and Wymore, I. J. On the influence of solar activity on radio transmission. Proc. Inst. Radio Engs., **16**, pp. 166–173; February, 1928.
Short period observations of daylight long wave signal measurements of Bureau of Standards and curves showing correlations with solar activity.

R114 Diagramme de champs électriques mesures à Meudon pendant le premier semestre 1927 (diagrams of electric fields measured at Meudon during the first months of 1927). L'Onde Electrique, **6**, pp. 603–605; December, 1927.
Curves shown for field intensity of LY, WSS, IDO, and GBL.

R125.1 Michelssen, F. Untersuchung en über die Peilbarkeit Kurzer Wellen bei Tag und Nacht (Investigations on the directive properties of short waves by day and night). Zeitschrift für Hochfrequenztechnik, **30**, pp. 183–87; December, 1927.
Practicability of short waves for use in direction-finding work.

R125.1 Fischer, F. A. Kurzwellenpeilversuche mit Rahmen und Hilfsantenne auf grössere Entfernungen über See (Short wave measuring experiments with coils and auxiliary antennas at great distances over water). Zeitschrift für Gochfrequenztechnik, **30**, pp. 188–189; December, 1927.
Results of tests carried out by the German marine on short waves in direction finding.

R127 Green, E. The radiation resistance and energy capacity of half-wave aerials. Experimental Wireless (London), **5**, pp. 82–84; February, 1928.
Demonstrates that it is possible to calculate radiation from antennas at high frequencies.

R132 von Ardenne, M. On the theory of power amplification. Proc. Inst. Radio Engs., **16**, pp. 193–97; February, 1928.
Calculation of direct-current plate and grid voltages of power tube for obtaining maximum distortionless output of sound from loud speakers.

R148.1 von Ardenne, M. Rectification as a criterion of distortion in amplifiers. Experimental Wireless (London), **5**, pp. 52-55; February, 1928.
Use of variation in plate current as measure of distortion. Theoretical and experimental investigation.

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Application of grid current modulation in an experimental carrier telephone system. Tubes, filters, and transformers discussed.

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Method of directional transmission developed whereby the direction-finding equipment is eliminated on the aircraft and difficulties are reduced.

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Results of tests using rotating beacon transmitter for transmissions over land and sea. Beacon was calibrated.

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