

DEPARTMENT OF COMMERCE

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION

Washington, January 31, 1927—No. 118

CONTENTS

	Page		Page
Abbreviations.....	1	Miscellaneous—Continued.	
New stations.....	2	List of Canadian, Mexican, Cuban, and	
Alterations and corrections.....	5	Italian broadcasting stations.....	11
Miscellaneous:		Use of the piezo oscillator in radio broad-	
Vessels equipped with a radiocompass.....	9	casting stations.....	12
Change in Poyner's Hill, N. C., radiocom-		Note on the standard frequency trans-	
pass station.....	9	missions of January 20, 1927.....	12
Naval station at Morehead City, N. C.,		Constant frequency stations.....	12
closed.....	9	Standard frequency stations.....	14
Changes in foreign stations.....	9	Referred to current radio literature....	14
Calibrated arcs of radiocompass stations.	10		

ABBREVIATIONS

The necessary corrections to the List of 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 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= Radiocompass station.
	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. Co.	= Independent Wireless Telegraph Co.
K. & C.	= Kilbourne & Clark Manufacturing Co.
R. C. A.	= Radio 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.

RADIO SERVICE BULLETIN

NEW STATIONS

Commercial land stations, alphabetically by names of stations

[Additions to the List of Radio Stations of the United States, edition of June 30, 1926, and to the International List of Radiotelegraph Stations published by the Berne Bureau]

Station	Call signal	Wave length	Service	Hours	Station controlled by—
Alabat, P. I. (Tayabas)	KZBB	500-1,000	PG		Philippine Insular Government.
Houston, Tex. ¹	KGM	1625	FX	X	Houston Printing Co. (Post Dispatch).
Kings Mill, Tex. ²	KYI	45.05	FX	X	Texas Pipe Line Co.
Marshfield, Oreg. ³	KGN	600,700	PG		W. K. Harris.
Medford, Oreg. ⁴	KGE	45.60	FX	X	Pacific Air Transport.
Naga-Naga, P. I. ⁵ (Zamboanga)	KZCC	700	FX	X	Mindanao Lumber Co.
Pandan, P. I. ⁶ (Catanduanes Islands)	KZPN	550-1,100, 850	PG		Philippine Insular Government.
Vancouver, Wash. ⁷	KEG	45	FX	X	Pacific Air Transport.
Wichita Falls, Tex. ⁸	KYU	45.02	FX	X	Texas Pipe Line Co.

¹ Loc. (approximately) O 122° 01' 00" E., N. 14° 06' 00"; range, 25; system, U. S. Army v. t. telegr.; hours, 8 a. m.-12 noon, 2-5.30 p. m. week days; 9-11 a. m. Sundays and holidays; ship service last 10 minutes of each hour; rates, 6 cents per word.

² Loc. (approximately) O 95° 24' 00", N. 29° 47' 00"; range, 200; system, Western Electric Co. v. t. telegraph.

³ Loc. O 101° 00' 23", N. 35° 20' 14"; system, composite v. t. telegraph.

⁴ Loc. (approximately) O 121° 10' 00", N. 42° 20' 00"; range, 150; system, composite v. t. telegraph; hours, 8 a. m.-8 p. m.; rates, 10 cents per word.

⁵ Loc. (approximately) O 123° 20' 00", N. 42° 20' 00"; system, composite v. t. telegraph.

⁶ Loc. (approximately) O 120° 53' 30" E., N. 07° 30' 34"; range, 200; system, E. & C., 1,000.

⁷ Loc. (approximately) O 124° 00' 45" E., N. 14° 02' 50"; range, 23; system, U. S. Army v. t. telegraph; hours, 8 a. m.-12 noon, 2-5.30 p. m. week days; 9-11 a. m. Sundays and holidays; ship service first 10 minutes of each hour; rates, 6 cents per word.

⁸ Loc. (approximately) O 122° 40' 00", N. 45° 20' 00"; system, composite v. t. telegraph.

⁹ Loc. (approximately) O 95° 20' 00", N. 31° 45' 00"; system, composite v. t. telegraph.

Commercial ship stations, alphabetically by names of vessels

[Additions to the List of Radio Stations of the United States, edition of June 30, 1926, 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—
Charles L. O'Connor	WMEA	8	PG	X	M. & J. Tracy	
D. M. Renton	KGEC				Wilmington Transportation Co.	
Ethel M. Sterling	KGED				Sterling Steamship Co.	
Inspector	KOKR		PG	X	Inspector Steamship Corporation.	
Interlake S. S. Co. (general call for all vessels of the company)	WPAA				Interlake Steamship Co.	
Kekuku	KUPV	8	PG	X	Chile Steamship Co.	
Kekoskee (RC)	KDGY	8	PG	X	Hickfield Oil Co.	
Lake Farber	KIRB	8	PG	X	York Steamship Corporation	
Michael Tracy	WMEB	8	PG	X	M. & J. Tracy	
Milton S. Patrick	KGEB				Wilmington Transportation Co.	
Northern Light	KQEG				John Boeden	
Romulus	KIDR	8	PG	X	Steamer Romulus Corporation.	

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
KDGY	Kekoskee.....b	KOKR	Inspector.....b
KEG	Vancouver, Wash.....c	KUPV	Kekuku.....b
KGE	Medford, Oreg.....c	KYI	Kings Mill, Tex.....c
KGEB	Milton S. Patrick.....b	KYU	Wichita Falls, Tex.....c
KGEC	D. M. Renton.....b	KZBB	Alabat, P. I. (Tayabas).....c
KGED	Ethel M. Sterling.....b	KZCC	Naga-Naga, P. I. (Zamboanga).....c
KQEG	Northern Light.....b	KZPN	Pandan, P. I. (Catanduanes Islands).....c
KGM	Houston, Tex.....c	WMEA	Charles L. O'Connor.....b
KGN	Marshfield, Oreg.....c	WMEB	Michael Tracy.....b
KIDR	Romulus.....b	WPAA	Interlake S. S. Co. (general call for

RADIO SERVICE BULLETIN

Broadcasting stations, alphabetically by names of States and cities

[Additions to the List of Radio Stations of the United States, edition of June 30, 1926, and List in Radio Service Bulletin No. 117, Dec. 31, 1926]

State and city	Call signal	State and city	Call signal
California:		New York:	
El Centro.....	KGEN	Auburn.....	WMBO
Inglewood.....	KMIC	Brooklyn.....	WMBQ
La Crescenta.....	KGFH	North Dakota: Jamestown.....	KGEL
Long Beach.....	KOER	Ohio:	
Lower Lake.....	KGEU	Ashtabula.....	WJPW
Colorado:		Cambridge.....	WEBE
Denver.....	KGEY	Cleveland.....	WJAY
Fort Morgan.....	KGEW	Hamilton.....	WMBK
Yuma.....	KGEK	Oklahoma:	
Florida:		Alva.....	KOFF
Boca Raton.....	WFLA	Oklahoma.....	KGFG
Lakeland.....	WMBL	Pennsylvania:	
Tampa.....	WMBR	Monessen.....	WMBJ
Illinois:		Pittsburgh.....	WMBU
Peoria Heights.....	WMBD	Rhode Island: Olneyville.....	WCOT
Chicago (portable).....	WMBH	Tennessee:	
Iowa:		Memphis.....	WMBM
Boone.....	KFGQ	Springfield.....	WBIX
Muscatine.....	KGEX	Texas: San Antonio.....	KGRC
Michigan: Detroit.....	WBMH	Virginia:	
Minnesota:		Richmond.....	WMBG
Minneapolis.....	KGEQ	Virginia Beach.....	WSEA
St. Paul.....	WMBE	Washington:	
Montana: Kalispell.....	KGEZ	Seattle.....	KPCB
Nebraska: Central City.....	KGES	Do.....	KROX

Broadcasting stations, alphabetically by call signals

[The power and wave lengths given in this table were compiled from applications for licenses furnished the department by the owners of the stations. Since the department does not make assignments in either respect, this list is not necessarily in conformity with wave lengths or power actually used]

Call signal	Location of station (address)	Owner of station	Power (watts)	Wave length	Frequency (kilo-cycles)
KFGQ	Boone, Iowa, 924 West Second St.	Boone Biblical College.....	19	300	999.4
KGEK	Yuma, Colo., 109 West Second Ave.	Beshler Electrical Equipment Co.	10	252	1,190
KGEL	Jamestown, N. Dak., 118 Fourth Ave. South.	Ernest W. Ellison.....	50	225	1,333
KGEN	El Centro, Calif.	E. R. Irey and F. M. Bowles.....	15	241	1,067
KGEQ	Minneapolis, Minn., 920 Fifth Ave. North.	Fred W. Herrmann.....	50	300	998.6
KOER	Long Beach, Calif., 435 Pine Ave.	C. Merwin Dohvns.....	100	325.9	920
KGES	Central City, Nebr.	Central Radio Electric Co.....	10	295.4	1,460
KGEU	Lower Lake, Calif., Lotowan Lodge.	L. W. Clement.....	50	222	1,331
KGEW	Fort Morgan, Colo.	City of Fort Morgan.....	10	256	1,171
KGEX	Muscatine, Iowa, East Second St.	Central Radio Co.....	100	256	1,171
KGEY	Denver, Colo., 1531 California St.	J. W. Dietz.....	15	204	1,470
KGEZ	Kalispell, Mont.	Flathead Broadcasting Association	100	352	851.8
KGFF	Alva, Okla.	Earl E. Hampshire.....	25	295.4	1,460
KGFG	Oklahoma City, Okla.	Full Gospel Church.....	50	394	750.8
KGFH	La Crescenta, Calif., P. O. Box 153	Frederick Robinson.....	100	218.8	1,370
KGRC	San Antonio, Tex., 103 San Pedro Ave.	Gene Roth & Co.....	50	315	951.8
KMIC	Inglewood, Calif., 317 Market St.	J. R. Fouch.....	500	387	774.7
KPCB	Seattle, Wash., 565 Central Building.	Pacific Coast Biscuit Co.....	50	521	575.6
KROX	Seattle, Wash., 4728 Bennett St.	N. B. Brown and W. J. Calsamala.	100	268.3	1,130
WBMH	Detroit, Mich., 13214 East Jefferson Ave.	Branin's Music House.....	100	352.7	850
WCOT	Olneyville, R. I., 1849 Westminster St.	Jacob Cobb.....	50	295.3	1,130
WEBE	Cambridge, Ohio, 319 Wall Ave.	Roy W. Waller.....	10	234	1,281
WFLA	Boca Raton, Fla.	Boca Raton Radio Corporation.....	1,000	410	681.4
WJAY	Cleveland, Ohio, Hotel Hollenden	Cleveland Radio Broadcasting Corporation.	1,000	433.7	688.1

RADIO SERVICE BULLETIN

Broadcasting stations, alphabetically by call signals—Continued

Call signal	Location of station (address)	Owner of station	Power (watts)	Wave length	Frequency (kilocycles)
WMBD	Peoria Heights, Ill., 107 East Glen Ave.	Peoria Heights Radio Laboratory.	250	279	1,075
WMBE	St. Paul, Minn., 2018 Grand Ave.	C. S. Stevens.....	5	220	1,363
WMBG	Richmond, Va., 914 West Broad St.	Havens and Martin.....	10	220	1,363
WMBH	Chicago, Ill. (portable), 1526 East Fifty-third St.	Edwin D. Aber.....	100	280	1,071
WMBJ	Monacaen, Pa.....	Star Theater (William R. McShaffrey).	50	277.6	1,080
WMBK	Hamilton, Ohio, The Green Lantern.	John C. Slado.....	10	300	822.8
WMBL	Lakeland, Fla., 14 Marble Arcade Building.	Benford Radio Studios.....	10	410	731.3
WMBM	Memphis, Tenn.....	Seventh Day Adventist Church.	10	248	1,224
WMBO	Auburn, N. Y., 17 South St.....	Radio Service Laboratories.....	200	238	1,260
WMBQ	Brooklyn, N. Y., 95 Leonard St.....	Paul J. Gollhofer.....	100	210	1,428
WMBR	Tampa, Fla., 109 Franklin St.....	Premier Electric Co.....	100	250	1,199
WMBU	Pittsburgh, Pa., 1123 Creedmoor Ave.	Paul J. Miller.....	50	280.1	1,270
WSEA	Virginia Beach, Va., Seventeenth St. and Atlantic Ave.	Virginia Beach Broadcasting Co.	500	518.9	560
WSIX	Springfield, Tenn.....	328 Tires & Vulcanizing Co. (Dad's Auto Accessories).	150	280	1,299

Government land stations, alphabetically, by names of stations

[Additions to the List of Radio Stations of the United States, edition of June 30, 1926, and to the International List of Radiotelegraph Stations published by the same bureau]

Station	Call signal	Wave length	Service	Hours	Station controlled by—
San Francisco, Calif.....	NGC	.....	0	.....	U. S. Coast Guard.

Government land and ship stations, alphabetically by call signals

[b, ship station; a, land station]

Call signal	Name of station	Call signal	Name of station
NGC	San Francisco, Calif.....	.....	.....

Special land stations, alphabetically by names of stations

[Additions to the List of Radio Stations of the United States, edition of June 30, 1926]

Station	Call signal	Station controlled by—
Lakewood, N. J.....	2XBH	Charles G. Unger, Ninth St. and Madison Ave. Potomac Electric Power Co. American Telephone & Telegraph Co., 725 Thirteenth St. NW.
Washington, D. C.....	3XAV	
Do.....	3XT	

Special land stations, grouped by districts

Call signal	District and station	Call signal	District and station
2XBH	Second district: Lakewood, N. J.	3XAV 3XT	Third district: Washington, D. C. Do.

RADIO SERVICE BULLETIN

5

ALTERATIONS AND CORRECTIONS

COMMERCIAL LAND STATIONS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1926, and to the International List of Radiotelegraph Stations, published by the Bureau]

BOLINAS, CALIF. (KEF).—W. L., 13,100.
 BUFFALO, N. Y.—W. L., add 1,960.
 CAPE CHACON, ALASKA.—W. L., 600, 900, 1,578.
 CASPER, WYO.—W. L., 1,689.
 CHOMLY, ALASKA.—System, W. S. A. Co., 240; w. l., 600, 900.
 CLEVELAND, OHIO (WCY).—W. L., add 1,578, 1,674.
 DALLAS, TEX. (WFAA).—W. L., 1,625.
 DALY, ALASKA.—W. L., 550, 600.
 HIDDEN INLET, ALASKA.—W. L., add 1,650, 1,850.
 LAS VEGAS, NEV.—W. L., 49.48.
 LOS ANGELES, CALIF. (portable; KFZ).—W. L., 146.3.
 LOS ANGELES, CALIF. (portable; KGV).—W. L., 146.3.
 LOS ANGELES, CALIF. (KVT).—W. L., 147, 600.
 MIAMI, FLA.—W. L., 70.74.
 MOBILE, ALA. (WNN).—System, R. C. A. v. t. telegraph and W. S. A. Co.; spark, 1,000; w. l., add 2,300.
 NEWARK, N. J.—W. L., 44.03.
 NEW BRUNSWICK, N. J. (WIZ).—W. L., 43.02.
 PINECREST, FLA.—W. L., 70.54; owner of station, R. P. Slayton.
 POINCIANA, FLA.—W. L., 70.54.
 POINT REYES, CALIF. (Bullards).—W. L., 12,500.
 PYBUS BAY, ALASKA.—W. L., 600, 900, 1,578.
 QUADRA, ALASKA (KHD).—W. L., 600, 900, 1,578.
 QUINCY, MASS.—W. L., 600, 690, 920.
 ROSE INLET, ALASKA.—W. L., 600, 900, 1,578.
 SAGINAW BAY, ALASKA.—W. L., 600, 900.
 SAN FRANCISCO, CALIF. (Beach Station; KFS).—Changed to Palo Alto, Calif. (near).
 SEATTLE, WASH. (KVW).—W. L., 600, 1,934.
 TENAKEE, ALASKA.—W. L., 600, 900, 1,587.
 WARREN, ALASKA.—W. L., 550, 600, 1,610.
 WASHINGTON, D. C. (WJH).—W. L., 142.8.
 WASHINGTON, D. C. (WJX).—W. L., 142.8.
 YES BAY, ALASKA.—W. L., 600, 900, 1,578.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY, BY NAMES OF VESSELS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1926, and to the International List of Radiotelegraph Stations, published by the Bureau]

AGWIDAY.—Station controlled by R. C. A.
 AGWISMITH.—Owner of vessel, Cape Steamship Co.
 ATENAB.—System, R. C. A. v. t. telegraph.
 BIRMINGHAM.—System, Navy-Marconi, 1,000.
 ANNAPOLIS.—W. L., 600, 730.
 CARRISO.—Owner of vessel, Carriso (Inc.).
 CARTAGO.—System, R. C. A. v. t. telegraph; w. l., 600, 706, 750, 800, 900, 1,800, 1,900, 2,000, 2,100, 2,400.
 DANNEDAIKE.—Owner of vessel, American Tankers Corporation.
 DISTRICT OF COLUMBIA.—Owner of vessel, Standard Oil Co. of California.
 ELMSFORD.—W. L., 600, 706, 800.
 FOUR WINDS.—Range, 150; system, R. C. A., 1,000; w. l., 600, 706, 800; service, PG; hours, X; rates, 8 cents per word; station controlled by owner of vessel.
 F. C. LATROBE.—W. L., 600, 730.
 GENERAL O. H. ERNST.—Name changed to Commercial Pilot.
 HEREDIA.—System, R. C. A. v. t. telegraph; w. l., 600, 706, 750, 800, 900, 1,800, 1,900, 2,000, 2,100, 2,400.
 I. A. BARRON.—W. L., 600, 706, 800, 1,800, 1,900, 2,000, 2,100, 2,400.

LANSING.—Range, 300; system, F. T. C. arc and spark, 1,000; w. l., 600, 706, 800, 1,800, 2,100, 2,250, 2,400.
 LT. COL. ROBERT G. GILDART.—System, Marconi, 1,000.
 MACKINAC.—Name changed to Woodssocket.
 MARQUETTE & BESSEMER No. 2.—System, R. C. A. v. t. telegraph; rates, Great Lakes service, 4 cents per word.
 MONTPELIER.—Correct call signal, WLZ.
 MUNLOYAL.—Range, 200; system, I. W. T. Co., 1,000.
 NEBRASKAN.—Owner of vessel, Nacco Steamship Line.
 NISHIMAH.—W. l., 600, 706, 800.
 ONTARIO.—W. l., 600, 706, 800.
 ORCUE.—Name changed to Coya.
 PARIEMINA.—System, R. C. A. v. t. telegraph; w. l., 600, 706, 750, 800, 900, 1,800, 1,900, 2,000, 2,100, 2,400.
 PHILIP D. BLOCK.—Radiocompass (direction finder) removed.
 ROHADOR.—System, R. C. A. v. t. telegraph and telephone; w. l., add 37.5, 115.38.
 ROBERT P. CLARK.—W. l., strike out 450.
 SACCARAPPA.—Station controlled by R. C. A.
 SAHALE.—W. l., 600, 706, 800.
 SUDBURY.—Owner of vessel, Sudbury Steamship Corporation.
 TAMARACK IV.—W. l., 119, 600; owner of vessel, Henry N. Torrey.
 UNION LIBERTY.—W. l., 600, 706, 800.
 VELEHO II.—System, W. S. A. Co., 1,000; w. l., 600, 800, 1,800.
 WEST CRESSY.—Station controlled by R. C. A.
 WEST KASSON.—Name changed to Cuzco.
 WESTLAND.—System, Navy, 1,000; w. l., 600, 706, 800.
 WEST MINGO.—Owner of vessel, Frank C. Hill.
 WIDGEON.—System, Navy, 1,000; w. l., 600, 706, 800; station controlled by I. W. T. Co.; rates, 8 cents per word.
 WILPEN.—Radiocompass (direction finder) removed.
 Strike out all particulars of the following-named vessels: Hera, J. M. Guffey, Niobe, Pawnee (KDGC), Sun.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY, BY CALL SIGNALS

KFS, read Palo Alto, Calif. (near); KFWT, read Woodssocket; KIKM, read Cuzco; KISC, read Coya; KPF, read Commercial Pilot; strike out all particulars following the call signals, KDGA, KDGB, KDGC, KTF, KTU.

BROADCASTING STATIONS, BY CALL SIGNALS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 20, 1925, and list in Radio Service Bulletin No. 117, Dec. 31, 1925. The power and wave lengths given hereunder were compiled from applications for licenses furnished the department by the owners of the stations. Since the department does not make assignments in either respect, this list is not necessarily in conformity with wave lengths or power actually used]

KFAU (Boise, Idaho).—Power, 5,000.
 KFBC (San Diego, Calif.).—Owner of station, W. K. Arbill and Howard Shores.
 KFDX (Shreveport, La.).—Power, 250.
 KFEQ (Oak, Nebr.).—Changed to St. Joseph, Mo.; power, 1,000.
 KFKB (Millford, Kans.).—W. l., 434.5, fy. kc., 690.
 KFQB (Fort Worth, Tex.).—Owner of station, Lone Star Broadcast Co. (Searchlight Publishing Co.).
 KFQP (Iowa City, Iowa).—Call signal changed to KFGB; owner of station, Albert C. Dunkel, 205 East College St.
 KFVG (Independence, Kans.).—Owner of station, First Methodist Episcopal Church.
 KFWI (South San Francisco, Calif.).—Changed to San Francisco, Calif.
 KFXF (Colorado Springs, Colo.).—Changed to Denver, Colo.
 KGCG (Newark, Ark.).—W. l., 234.2, fy. kc., 1,280.
 KGCI (San Antonio, Tex.).—Power, 15; owner of station, Liberty Radio Sales, 409 South Flores St.
 KGCL (Seattle, Wash.).—W. l., 238, fy. kc., 1,260.
 KGCN (Concordia, Kans.).—W. l., 235, fy. kc., 1,270.
 KGDZ (Des Moines, Iowa).—Call signal changed to KWLC; owner of station,

RADIO SERVICE BULLETIN

7

- KJBS (San Francisco, Calif.).—W. L., 220.4, fy. kc., 1,360.
 KLZ (Denver, Colo.).—W. L., 384.4, fy. kc., 780.
 KNRC (Los Angeles, Calif.).—Changed to Santa Monica, Calif., power, 720.
 KNX (Los Angeles, Calif.).—Power, 500.
 KOB (State College, N. Mex.).—Power, 5,000.
 KOMO (Seattle, Wash.).—This station, owned by Fisher's Blend Station (Inc.), mentioned in this publication for last month, is a new station. The call signal being transferred from the station owned by the American Radio Telephone Co. and operated by Birt F. Fisher. Call signal KGFA has now been assigned to the station of the American Radio Telephone Co.
 KRSC (Seattle, Wash.).—Power, 100.
 KTNT (Muscatine, Iowa).—Power, variable.
 KUSD (Vermillion, S. Dak.).—Power, 1,000.
 WABC (Richmond Hill, N. Y.).—Owner of station, Atlantic Broadcasting Corporation (A. H. Grebe & Co.), address, 113 West Fifty-seventh St., New York, N. Y.
 WABQ (Philadelphia, Pa.).—Keystone Broadcasting Co. (Haverford College Radio Club).
 WAFD (Port Huron, Mich.).—Changed to Detroit, Mich., Charlotte St. and Woodward Ave., w. l., 312.3, fy. kc., 960.
 WAIU (Columbus, Ohio).—Power, 5,000.
 WAMD (Minneapolis, Minn.).—Owner of station, Radiason Radio Corporation and Stanley E. Hubbard; power, 5,000.
 WBAP (Fort Worth, Tex.).—Owner of station, Carter Publications (Inc.) (Star Telegram).
 WBBR (Rossville, N. Y.).—Power, 1,000.
 WBMS (North Bergen, N. J.).—Changed to Union City, N. J., State Capitol Theater Building; power, 100.
 WBOQ (Richmond Hill, N. Y.).—Owner of station, Atlantic Broadcasting Corporation (A. H. Grebe & Co.), 113 West Fifty-seventh St., New York, N. Y.; power, 500; w. l., 236.1; fy. kc., 1,270.
 WBRL (Tilton, N. H.).—W. L., 420; fy. kc., 713.9.
 WCAR (San Antonio, Tex.).—Power, 5,000.
 WCBS (Providence, R. I.—portable).—Address, 222 Freeborn Ave., Providence, R. I.; w. l., 242.5, fy. kc., 1,237.
 WCLO (Camp Lake, Wis.).—Power, 100.
 WCSO (Springfield, Ohio).—Power, 750.
 WDAE (Tampa, Fla.).—Power, 500.
 WDBE (Atlanta, Ga.).—Power, 100.
 WDBK (Cleveland, Ohio).—Owner of station, WDBK Broadcasting Co. (Inc.) (Stanley J. Broz), Bolton Square Hotel.
 WDXL (Detroit, Mich.).—Owner of station, WDXL (Inc.).
 WEAI (Ithaca, N. Y.).—Power, 250.
 WEAU (Sioux City, Iowa).—Power, 150.
 WEBC (Superior, Wis.).—Power, 500.
 WEHS (Evanston, Ill.).—Owner of station, A. T. Becker (Robert E. Hughes), 1318 Elmwood Ave., power, 100; w. l., 241.8, fy. kc., 1,240.
 WFAV (Lincoln, Nebr.).—Power, 500.
 WFKB (Chicago, Ill.).—Power, 1,000.
 WGES (Chicago, Ill.).—Owner of station, Oak Leaves Broadcasting Corporation.
 WGHB (Clearwater, Fla.).—Call signal changed to WFHH; w. l., 355.4, fy. kc., 843.6.
 WHAZ (Troy, N. Y.).—Power, 1,000.
 WIBO (Chicago, Ill.).—Owner of station, WIBO Broadcasters (Inc.), 6312 Broadway; power, 5,000.
 WJAZ (Mt. Prospect, Ill.).—Address, 3620 Iron St., Chicago, Ill.
 WJBV (Woodhaven, N. Y.).—Call signal changed to WSOM. Notice in this publication for last month gave WJBY as the former call signal; owner of station, Union Course Laboratories (George J. Cook).
 WJR (Pontiac, Mich.).—Owner of station, Station WJR (Inc.), and the Detroit Free Press.
 WKBN (Youngstown, Ohio).—Power, 100; address, Young Men's Christian Association.
 WKBO (Jersey City, N. J.).—W. L., 220.4, fy. kc., 1,360.
 WKBR (Auburn, N. Y.).—Strike out all particulars.
 WKBV (Brookville, Ind.).—Power, 250.

RADIO SERVICE BULLETIN

WMC (Memphis, Tenn.).—Power, 500.
 WMPC (Lapeer, Mich.).—Power, 15; w. l., 202, fy. kc., 1,484.
 WOCB (Orlando, Fla.).—Power, 250.
 WOK (Homewood, Ill.).—Power, 6,000; w. l., 410, fy. kc., 731.3.
 WOOD (Grand Rapids, Mich.).—Changed to Furnwood, Mich.
 WOWO (Port Wayne, Ind.).—Power, 1,200.
 WPCC (Chicago, Ill.).—Power, 750.
 WQAC (Amarillo, Tex.).—Call signal changed to KGRS. Notice in this publication for November, last, gave WDAG as the former call signal.
 WRAW (Reading, Pa.).—Power, 100.
 WREC (Coldwater, Miss.).—Changed to Whitehaven, Tenn.; power, 15.
 WRRM (Minneapolis, Minn.).—Power, 5,000.
 WSMB (New Orleans, La.).—Owner of station, Saenger Theatres (Inc.) and Maison Blanche Co.
 WTAQ (Eau Claire, Wis.).—Power, 500.
 WWAÉ (Plainfield, Ill.).—Changed to Chicago, Ill., 2024 Wabash Ave.; w. l., 241.8, fy. kc., 1,240.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 16, 1926, and to the International List of Radiotelegraph Stations, published by the Berné Bureau]

HAN HARBOR, Me. (Sewall-traffic station).—W. l., 600, 2,100, 2,541, 5,854.
 BETHEL, ALASKA.—Rates, 12 cents per word.
 CRAIG, ALASKA.—Rates, 12 cents per word.
 EMPIRE, OREG.—The notice in this publication for last month, page 22, gave the call signal of this station as MPF whereas it is NPF.
 FORT ST. MICHAEL, ALASKA.—Rates, 12 cents per word.
 FORT STEVENS, OREG.—Call signal changed to NZR.
 MOREHEAD CITY, N. C.—Strike out all particulars.
 NOME, ALASKA.—Rates, 12 cents per word.
 PARRIS ISLAND, S. C.—W. l., 600, 750; service, PG; hours, N.; rates, 12 cents per word.
 POYNERS HILL, N. C.—Loc. of transmitter; W 75° 48' 10", N 36° 17' 16"; the call signal of this station is NDX—NCZ remains the call signal for the group, Poyners Hill, N. C., Hog Island and Virginia Beach, Va.
 SAN JUAN, P. R.—W. l., 600, 2,100, 2,828, 6,849.
 SAVANNAH, GA.—Hours, 7 a. m.—8 p. m.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1926, and to the International List of Radiotelegraph Stations, published by the Berné Bureau]

VIRGINIA I.—The name of this vessel was incorrectly given in this publication for last month page 3 under heading "Government Land and Ship Stations" alphabetically by call signals.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS

NAN, strike out all particulars; NDX, read Poyners Hill, N. C.; NZR read Fort Stevens, Oreg. (formerly NPE).

SPECIAL LAND STATIONS, BY NAMES OF STATIONS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1926]

DELANCO, N. J. (3XP).—Strike out all particulars.
 ONRUST (tugboat-portable-2XN).—Strike out all particulars.
 RICHARD HILL, N. Y. (2XE).—Atlantic Broadcasting Corporation.
 SAN PEDRO CALE (6XRN).—Changed to Venice, Calif., address, 1852 South

RADIO SERVICE BULLETIN

9

MISCELLANEOUS

VESSELS EQUIPPED WITH A RADIOCOMPASS

The steamer *Dean Emery* and the lighthouse tender *Manzanita* are now equipped with a radiocompass (direction finder). The name of the vessel *William C. Alwater* published in the November, No. 116, edition of the BULLETIN was incorrectly cited, in that the middle initial was given as A whereas it should have been C.

CHANGE IN POYNERS HILL, N. C., RADIOCOMPASS STATION

This station now has a separate transmitter located in latitude $36^{\circ} 17' 16''$ N., longitude $75^{\circ} 48' 10''$ W., but this does not change the operation of the group in which it is located, Virginia Beach still controls as before. A call signal, NDX, is now assigned to the Poyners Hill transmitter and it is therefore available for radiobeacon service. Appropriate changes should be made on page 116, list of Commercial and Government Radio Stations of the United States.

NAVAL STATION AT MOREHEAD CITY, N. C., CLOSED

This station will be closed on or about February 15. Traffic formerly handled by this station should be routed via Charleston, S. C., or Norfolk, Va. Although the Cape Hatteras station is open to general public business, it is believed that marine traffic would receive better service if routed through stations other than it.

CHANGES IN FOREIGN STATIONS

Holland.—Weather reports and navigational reports are now transmitted on 2,930 meters. Navigational warnings are also repeated twice on 600 meters immediately after the transmission on 2,930 meters.

France.—The fog signal (radiobeacon) of the Casquets Lighthouse, Channel Islands, has been changed as follows: The signal will be transmitted for one minute every five minutes. Each transmission will comprise two consecutive series occupying 30 seconds each, consisting of groups of the letters ZZQ (— . . . — . . . — . . .) repeated throughout a period of 20 seconds, at a speed of approximately 10 words per minute, each group being followed by a long dash of 10 seconds duration, thus: — . . . — . . . — . . . — . . . — . . . (20 seconds), — (10 seconds), — . . . — . . . — . . . — . . . — . . . (20 seconds), — (10 seconds), silent (4 minutes). Location (approximately) latitude $49^{\circ} 43' N.$, longitude $2^{\circ} 23' W.$; wave length, 1,000 meters.

Azores.—Sao Miguel, call signal PQA, transmits weather reports on 2,200 meters, c. w., at 0832 and 1832.

New Zealand.—A fog signal (radiobeacon) has been established at the southern end of North Island about half a mile northwestward of Cape Maria Van Diemen, latitude $34^{\circ} 28' 50'' S.$, longitude $172^{\circ} 38' 45'' E.$ The signal is operated automatically during low visibility. It consists of a series of the letter J transmitted every five minutes, thus: . — . — . — . — . — . etc. for two minutes, silent, three minutes, on a wave length of 1,000 meters. Vessels desiring the signal to operate on occasions other than during fog, for the purpose of obtaining a line of position, should make the following message to Awanui, call signal, VLA: "Request operate Cape Maria radiobeacon commencing (here state time in New Zealand standard time)." On receipt of the message, Awanui will immediately instruct Cape Maria Van Diemen. The signal will be transmitted for a period of 30 minutes from the time indicated.

Sweden.—Konigswusterhausen, call signal AFR, station now transmits weather bulletins on a wave length of 3,350 meters, c. w.

Africa.—Weather reports previously transmitted by the Walvis Bay station at 1800 and 2000 G. M. T. are now transmitted at 1230 and 2000 G. M. T. Weather reports previously transmitted by the Capetown station at 1115 G. M. T. are now transmitted at 1220 G. M. T.

Australia.—Time signals are now transmitted from the Melbourne station, call signal VIM, on 600 meters spark, in accordance with the new international system of radio time signals at the following times:

G.M.T.			Standard Time			
h.	m.	s.	h.	m.	s.	
1	57	00	to	2	00	00
equivalent to						
11	57	00	to	12	00	00

The transmission of each series of signals is similar, the procedure being as follows:

G.M.T.						Signal					
h.	m.	s.	h.	m.	s.						
13 ¹	57	00 to	13 ¹	57	50	—	—	—	—	—	—
	57	55 to	58	00		55	56	57	58	59	60
	58	08 to	58	10		.	.	.	.	.	.
	58	18 to	58	20		—	.	.	.	.	.
	58	28 to	58	30		—	.	.	.	.	.
	58	38 to	58	40		—	.	.	.	.	.
	58	48 to	58	50		—	.	.	.	.	.
	58	55 to	59	00		55	56	57	58	59	60
	59	06 to	59	10		.	.	.	.	.	.
	59	16 to	59	20		—	.	.	.	.	.
	59	26 to	59	30		—	.	.	.	.	.
	59	36 to	59	40		—	.	.	.	.	.
	59	46 to	59	50		—	.	.	.	.	.
13 ¹	59	55 to	14 ²	00	00	55	56	57	58	59	60

Time Signal

Chile.—Navigational warnings are now transmitted by stations of this country as follows:

Station	Call signal	Wave length (spark)	Time
Arica.....	CCA	1,300	0120, 1330
Antofagasta.....	CCB	2,200	0110, 1320
Coquimbo.....	CCC	1,300	0100, 1310
Valparaiso ¹	CCE	1,000	0050, 1300
Juan Fernandez.....	CCD	800	0120, 1330
Talcahuano.....	CCK	1,800	0100, 1310
Llanquihue.....	CCO	4,500	0130, 1330
Punta Arenas.....	CCW	6,500	0150, 1350

¹ Transmits notices to mariners of an urgent character, containing information of immediate importance to shipping, in plain language. The messages are preceded by the letters OHC (Official Hydrographic of Chile) and a number, the latter for reference purposes only, and, also to enable vessels to tell if they have not received a particular notice. Examples: (a) OHC 152 San Pedro Light extinguished, (b) OHC 150 Cancel OHC 152 San Pedro Light again exhibited.

CALIBRATED ARCS OF RADIOCOMPASS STATIONS

The working sectors or calibrated arcs of the radiocompass stations on the Pacific coast and in Alaska are as follows:

Station	Call signal	Arc of calibration	Station	Call signal	Arc of calibration
Imperial Beach, Calif.....	NPZ	184-344	Fort Stevens, Oreg.....	NZR ¹	170-50
Point Fermin, Calif.....	NPX	98-282	Klipsan Beach, Wash.....	NZS	155-345
Point Hueneume, Calif.....	NMD	150-320	Destruction Islands, Wash.....	NOJ	0-360
Point Arguello, Calif.....	NPK	111-353	Tatcoah Island, Wash.....	NPD	160-50
Point Montara, Calif.....	NLH	170-351	New Dungeness, Wash.....	NFT	240-120
Farallon Islands, Calif.....	NPI	0-360	Smith Island, Wash.....	NFH	0-360
Point Reyes, Calif.....	NLQ	120-2	Cattle Point, Wash.....	NFN	120-280
Eureka, Calif.....	NPW	204-10	St. Paul Island, Alaska.....	NPQ	60-302
Point St. George, Calif.....	NYW	178-10	Soapstone Point, Alaska.....	NUW	240-50
Empire, Oreg.....	NPF	65-10	Cape Hinchbrook, Alaska.....	NRM	110-294

RADIO SERVICE BULLETIN

11

List of Canadian, Mexican, Cuban, and Haitian Broadcasting Stations

CANADA

Location	Call signal	Wave length	Power (watts)	Operated by—
Nova Scotia: Halifax.....	CHNS	322.4	100	Carlton Hotel.
Prince Edward Island:				
Charlottetown.....	CFCY	312.3	50	Island Radio Co.
Summerside.....	CHLC	267.7	25	R. T. Holmes (Ltd.).
New Brunswick: Moncton.....	CNRA	322.4	500	Canadian National Railways.
Quebec:				
Montreal.....	CFCF	410.7	1,050	Canadian Marconi Co.
Do.....	CHYC	410.7	750	Northern Electric Co. (Ltd.).
Do.....	CKAC	410.7	1,250	La Presse Publishing Co.
Do.....	CNRM			Canadian National Railways.
Quebec.....	CHRC	340.7	5	E. Fontaine.
Do.....	CECY	340.7	50	G. A. Vapdry.
St. Hyacinthe.....	CKSH	312.3	50	Municipal station.
Ontario:				
Brantford.....	CFOC	290.9	50	Brant Radio Supply Co. (Ltd.).
Burkton Junction.....	CKCW	322.4	5,000	Canadian Broadcasting Corporation.
Cobalt.....	CKMO	347.8	5	R. L. MacAdam.
Hamilton.....	CKOC	340.7	50	Wentworth Radio Supply Co.
Do.....	CHCS	340.7	10	Hamilton Spectator.
Huntsville.....	CHCO	267.8	5	A. Staples.
Innisville Falls.....	CFCH	400.7	250	Abilla Power and Paper Co.
King.....	CJCO	291.1	1,000	Standard Radio Manufacturing Corporation.
Kingston.....	CFMC	267.7	20	Monarch Battery Co.
Do.....	CFRO	267.7	500	Queen's University.
Kitchener.....	CJCF	347.8	25	O. Rumpel.
London.....	CJOC	434.5	500	Free Press Printing Co.
Ottawa.....	CKCO	434.5	100	Dr. G. M. Goldock.
Do.....	CHKO	434.5	250	J. R. Booth.
Do.....	CNRO			Canadian National Railways.
Prescott.....	CFLO	290.9	50	Radio Association.
Preston.....	CKPC	247.8	7½	Wallace Huss.
Scarboro Station.....	CJYC	291.1	500	Universal Radio Co.
Toronto.....	CFCA	350.9	500	Star Publishing and Printing Co.
Do.....	CJSC			Evening Telegram.
Do.....	CKCK			International Bible Students' Assn.
Do.....	CHNC			Toronto Radio Research Society.
Do.....	CJBC			James Street Baptist Church.
Do.....	CKNC	350.9	500	Canadian National Carbon Co.
Do.....	CJCI	291.1		Loyal Order of Moose.
Do.....	CKCL	350.9	500	Dominion Battery Co.
Do.....	CNRT			Canadian National Railways.
Do.....	CHIC			Northern Electric Co.
Manitoba:				
Winnipeg.....	CKY	304.1	500	Provincial government.
Do.....	CNRW			Canadian National Railways.
Saskatchewan:				
Moosejaw.....	CJRM	290.9	50	James Richardson & Sons (Ltd.).
Regina.....	CNRR			Canadian National Railways.
Do.....	CHWC	312.3	15	R. H. Williams & Sons (Ltd.).
Do.....	CKCK	312.3	500	Leader Publishing Co.
Saskatoon.....	CHUC	320.5	500	International Bible Students' Association.
Do.....	CFQC	320.5	500	The Electric Shop (Ltd.).
Do.....	CHWC	322.4	250	Wheaton Electric Co. (Ltd.).
Do.....	CNRR			Canadian National Railways.
Alberta:				
Calgary.....	CNRC			Do.
Do.....	CFCN	434.5	1,800	W. W. Grant (Ltd.).
Do.....	CFAC	434.5	500	Calgary Herald.
Edmonton.....	CHCY	516.9	250	International Bible Students' Association.
Do.....	CFCK	516.9	50	Radio Supply Co. (Ltd.).
Do.....	CJCA	516.9	500	Edmonton Journal.
Do.....	CNRE			Canadian National Railways.
Lethbridge.....	CJOC	267.7	50	J. E. Palmer.
British Columbia:				
Burnaby.....	CFYO	410.7	500	International Bible Students' Association.
Kamloops.....	CFJC	267.7	15	Degleish & sons and Weller & Weller.
Sea Island.....	CFOR	291.1	50	G. C. Chandler.
Vancouver.....	CFCQ	410.7	50	Sproull-Shaw Business Institute.
Do.....	CKPC	410.7	50	United Church of Canada.
Do.....	CNRV	291.1	500	Canadian National Railways.
Do.....	CKCD	410.7	1,000	Daily Province.

List of Canadian, Mexican, Cuban, and Haitian Broadcasting Stations—Contd.

MEXICO

Location	Call signal	Wave length	Power (watts)	Operated by—
Chihuahua.....	CZF	310	250	State Capitol.
Mazatlan.....	CYR	475	250	Castulo Llamas.
Mexico City.....	CYA	300	500	Elfrán R. Gomez.
Do.....	CYB	275	500	Jose J. Reynosa.
Do.....	CYH	375	100	Miguel S. Castro.
Do.....	CYJ	400	2,000	
Do.....	CYL	400	500	R. Azcaraga.
Do.....	CYO	425	100	Martinez y Zelina.
Do.....	CYX	325	500	El Excelator.
Do.....	CZE	350	500	Department of Education.
Monterrey.....	CYH	311	250	Constantino de Tarnava.
Oaxaca.....	CYF	265	100	Frederico Zentilla.
Puebla.....	CYU	312	100	Augustin del P. Zanon.
Tampico.....	CYQ	322	100	Cipriano Sagard, S. en C.
Do.....	CYZ		20	Manuel Guzman Willis.
Vera Cruz.....	CYC	357	50	Manuel Angel Fernandez.
Merida.....	CYY	545	100	Socialist Party.

CUBA

Central Ella.....	7SR	350	500	Salvador Rionda.
Cienfuegos.....	8HY	290	200	Jose Ganduxa.
Havana.....	2BB	290	15	Bernardo Barrio.
Do.....	2MG	284	20	M. y G. Salas.
Do.....	PWX	400	500	Cuban Telephone Co.
Do.....	2OK	280	100	Marlo Garcia Velez.
Do.....	2OL	225	100	Oscar Collado Orts.
Do.....	2IK	315	20	Haoul Karman.
Do.....	2TW	270	20	Roberto E. Ramirez.
Do.....	2UF	265	10	Benito Viera Ferro.
Do.....	2LR	235	50	Jose Iarn.
Tulua.....	6KW	340	100	Frank H. Jones.

HAITI

Port au Prince.....	HHK	361.2	1,000	Government.
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USE OF THE PIEZO OSCILLATOR IN RADIO BROADCASTING STATIONS

The Bureau of Standards has just issued Letter Circular 223 describing the use of a piezo oscillator in a broadcasting station for checking and assisting to maintain a constant frequency close to the licensed value. This application of the piezo oscillator is not the same as automatic piezo control. The letter circular, in addition, gives suggestions for the construction of a piezo oscillator for this use, rendering it somewhat simpler for this particular application than the construction outlined in Letter Circular 186. Copies of these letter circulars may be obtained by persons having actual use for them upon application addressed to the Bureau of Standards, Washington, D. C.

NOTE ON THE STANDARD FREQUENCY TRANSMISSIONS OF JANUARY 20, 1927

On the evening of January 20 the usual standard frequency signals were transmitted from station WWV of the Bureau of Standards. Through a mistake, the last frequency sent out was 321.6 kc. instead of 315 kc. as previously announced in the RADIO SERVICE BULLETIN for October 30, 1926, and elsewhere, and as announced at the time of transmission.

CONSTANT FREQUENCY STATIONS

The list of "constant frequency stations" given below supplements the list of "standard frequency stations." The transmitted waves from the stations in either list should be of value to the public as frequency standards because of their constancy and close adherence to the licensed values. The Bureau of

RADIO SERVICE BULLETIN

13

standard frequency stations only. The constant frequency stations in the following supplementary list do not carry the same assurance of reliability as if the transmitted waves were regularly measured by the Bureau of Standards, but it is probable that if measurement data were available many of them would show the same constancy as the standard frequency stations.

The fundamental requirement of a broadcasting station for inclusion in the following list is the employment of a special device for controlling or checking the frequency, the calibration of such a device being in agreement with the bureau's frequency standards. The special device may be automatic piezo control, a piezo oscillator, piezo resonator, or frequency indicator. Stations not included in this list nor in the list of standard frequency stations, which use one of the special devices for frequency regulation, are invited to communicate with the Bureau of Standards requesting a copy of Letter Circular 214, Requirements of Constant Frequency Stations.

Station	Owner	Location	Frequency (Kilo-cycles)	Wave length (meters)	Apparatus for frequency regulation
WIO	Bankers Life Co.....	Des Moines, Iowa.....	570	526	Piezo oscillator.
KFHU	Stephens College.....	Columbia, Mo.....	599	499.7	Frequency indicator.
WOC	Palmer School of Chiropractic.	Davenport, Iowa.....	629	482.6	Piezo oscillator.
WTIC	Travelers' Insurance Co.	Hartford, Conn.....	630	475.9	Do.
WMAQ	Chicago Daily News...	Chicago, Ill.....	670	447.5	Frequency indicator, type B and piezo oscillator.
KLDS	Reorganized Church of Jesus Christ of Latter Day Saints.	Independence, Mo....	680	440.9	Frequency indicator.
KPO	Hels Bros. and The Chronicle.	San Francisco, Calif...	700	428.3	Do.
WLW	Crosley Radio Corporation.	Harrison, Ohio.....	710	423.3	Frequency indicator and piezo oscillator.
WCCO	Washburn-Crosby Co...	St. Paul-Minneapolis, Minn.	729	416.4	Piezo oscillator.
WTAM	Willard Storage Battery Co.....	Cleveland, Ohio.....	770	399.4	Do.
WEAR	New Arlington Hotel Co.	Hot Springs, Ark.....	800	374.8	Frequency indicator, type B.
KTHS	Loyal Order of Moose...	Moosbeart, Ill.....	810	370.2	Piezo oscillator.
WJD	General Electric Co....	Oakland, Calif.....	830	361.2	Do.
KGO	Frank P. Jackson.....	Waco, Tex.....	850	352.7	Frequency indicator, type B.
WIAD					Do.
WWJ	Detroit News.....	Detroit, Mich.....	950	332.7	Piezo oscillator.
WLS	Sears, Roebuck & Co.	Crete, Ill.....	870	344.6	Frequency indicator, type B.
KFAB	Nebraska Butch Motor Co.	Lincoln, Nebr.....	880	340.7	Do.
WKAQ	Radio Corporation of Puerto Rico.	San Juan, P. R.....	880	340.7	Do.
KOA	General Electric Co....	Denver, Colo.....	935	323.4	Piezo oscillator.
WEAO	Ohio State University..	Columbus, Ohio.....	1,020	293.9	Frequency indicator, type B.
WFBG	William P. Gable Co...	Altoona, Pa.....	1,080	277.6	Frequency indicator.
KFKA	Colorado State Teachers' College.	Greeley, Colo.....	1,100	272.6	Piezo oscillator.
WBAA	Purdue University.....	West Lafayette, Ind...	1,100	272.6	Do.
WOF	Iowa State College.....	Ames, Iowa.....	1,110	270.1	Automatic piezo control (checked with type B frequency indicator).
KFH	Hotel Lessen.....	Wichita, Kans.....	1,120	267.7	Frequency indicator, type B.
WENR	All American Radio Corporation.	Chicago, Ill.....	1,130	265.3	Piezo oscillator.
WCAD	St. Lawrence University.	Canton, N. Y.....	1,140	263	Frequency indicator.
WAAM	I. H. Nelson.....	Newark, N. J.....	1,140	263	Piezo oscillator.
WOWO	Main Auto Supply Co..	Fort Wayne, Ind.....	1,220	237.1	Do.
WBBM	Atlas Investment Co..	Chicago, Ill.....	1,350	225.4	Do.
WEBQ	Tate Radio Co.....	Harrisburg, Ill.....	1,380	221.4	Piezo oscillator, type N.
KFVS	Hirsch Battery & Radio Co.	Cape Girardeau, Mo..	1,340	223.7	Frequency indicator, type B.

STANDARD FREQUENCY STATIONS

As a result of measurements by the Bureau of Standards upon the transmitted waves of a limited number of radio transmitting stations, data are given in each month's RADIO SERVICE BULLETIN on such of these stations as have been found to maintain a sufficiently constant frequency to be useful as standards.

As shown by the list of "constant frequency stations," there may be many other stations not measured in the bureau's laboratory which maintain their frequencies just as constant as the stations listed below. There is, of course, no actual guaranty that these stations will maintain the constancy shown, but the data indicate the high degree of confidence that can be placed in them. The transmitted frequencies from the standard frequency stations can be utilized for calibrating frequency meters and other apparatus by the procedure given in Bureau of Standards Letter Circular No. 171, which may be obtained by a person having actual use for it upon application to the Bureau of Standards, Department of Commerce, Washington, D. C.

Station	Owner	Location	Frequency (kilo-cycles)	Period covered by measurements (months)	Number of times measured	Deviations from assigned frequencies noted in measurements	
						Average	Greatest since Dec. 25, 1925
N88	United States Navy...	Annapolis, Md.....	17.50	8	41	Per cent 0.1	Per cent 0.3
WCI	Radio Corporation of America.	Tuckerton, N. J.....	17.95	23	102	.1	.1
WES	.....do.....	Rocky Point, N. Y..	18.50	4	14	.1	.2
WGG	.....do.....	Tuckerton, No. 1, N. J.	18.55	41	277	.1	.2
WVA	United States Army...	Annapolis, Md.....	100	22	172	.2	.3
NAA	United States Navy...	Arlington, Va.....	112	15	74	.2	.5
WEAF	National Broadcasting Co.	New York, N. Y....	610	25	151	.0	.0
WRC	Radio Corporation of America.	Washington, D. C..	640	37	179	.1	.3
WIZ	.....do.....	Bound Brook, N. J.	660	8	32	.2	.3
NAA	United States Navy...	Arlington, Va.....	690	8	38	.1	.4
WGY	General Electric Co...	Schenectady, N. Y..	790	43	190	.1	.0
WBZ	Westinghouse Electric & Manufacturing Co.	Springfield, Mass...	900	21	88	.1	.2
KDKA	.....do.....	East Pittsburgh, Pa.	970	8	35	.1	.1
KDKA ¹	.....do.....	.....do.....	4,711	8	24	.1	.0

¹ High-frequency telephone transmitting station.

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

R010 DelHager, J. H. The International Union of Scientific Radio Telegraphy. *Science*, 64, pp. 513-529, Dec. 31, 1925.

R100.—Radio principles

R113.1 Smith, T. A., and Rodwin, G. An automatic fading recorder. *Proceedings Institute of Radio Engineers*, 15, pp. 41-47, January, 1927.

R113.1 Smith-Ross, H. L. Signal fading measurements (practical details for constructing and calibrating the necessary apparatus). *Wireless World & Radio Review*, 20, pp. 22-27, Jan. 12, 1927.

R113.4 Appleton, E. V. The Heaviside layer (experimental proof of its existence). *Wireless World*

RADIO SERVICE BULLETIN

15

- R113.7 Transmission on short waves (resume of paper by Heising etc. in Proceedings Institute of Radio Engineers). *Wireless World & Radio Review*, 19, pp. 854-859, Dec. 29, 1926.
- R113.7 Meany, R. Au sujet de la nouvelle formule de propagation de Kiebtz. *L'Onde Electrique*, 4, pp. 650-656, December, 1926.
- R113.9 Holtzappel, E. C. Report concerning the observation of the influence on the propagation of radio waves of the sun eclipse of the 14th of January, 1925, in the Dutch East Indies. *Proceedings Institute of Radio Engineers*, 16, pp. 61-62, January, 1927.
- R124 Mathiesen, M. Collapsible loop aerial. U. S. Patent No. 1614484 issued Jan. 18, 1927.
- R125.1 Watson-Watt, R. A. and Herd, J. F. A new radiogoniometer—an instantaneous direct reading instrument a close approximation to the ideal—use in the study of atmospheric (abstract). *Electrician (London)*, 97, p. 753, Dec. 31, 1926.
- R125.1 Dunmore, F. W. Un radiogoniometre a une seule commande. (abstract of paper Bureau of Standards Scientific No. 323). *QST Français et Radioelectricite Reunis*, 7, pp. 26-29, December, 1926.
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RADIO SERVICE BULLETIN

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