

# DEPARTMENT OF COMMERCE

# RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION

Washington, January 2, 1925—No. 93

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## 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 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.		
	PG = General public.		
	PR = Limited public.		
	RC = Radio compass station.		
	FS = Fog signal.		
	P = Private.		
	O = Government business exclusively.		
Hours	= Hours of operation:		
	N = Continuous service.		
	X = No regular hours.		
F. T. Co.	= Federal Telegraph Co.		
I. W. T. Co.	= Independent Wireless Telegraph Co.		
K. & C.	= Kilbourne & Clark Manufacturing Co.		
R. C. A.	= Radio Corporation of America.		
S. O. R. S.	= Ship Owners' Radio Service.		
W. S. A. Co.	= Wireless Specialty Apparatus Co.		
C. w.	= Continuous wave.		
I. c. w.	= Interrupted continuous wave.		
V. t.	= Vacuum tube.		
PX	= Fixed station.		
U. S. L.	= After operating company denotes that the change applies only to the List of Radio Stations of the United States.		
Kc.	= Kilocycles.		
Fy.	= Frequency.		
A. c.	= Alternating current.		

**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, 1924, and to the International List of Radiotelegraph Stations published by the Berns Bureau]

Station	Call signal	Wave lengths	Service	Hours	Station controlled by—
Glasgow, Mont. <sup>1</sup> .....	KEP	1636.....	FX	.....	E. L. Wharton.
Iron Mountain, Mich. <sup>2</sup>	WDY	140, 1600, 1975...	P	X	Ford Motor Co.
Jordan, Mont. <sup>3</sup> .....	KFO	1636.....	FX	X	T. A. Brick.
L'Anse, Mich. <sup>4</sup> .....	WCT	1600, 1875.....	P	X	Ford Motor Co.

<sup>1</sup> Loc. (approximately) O 106° 40' 00", N 48° 29' 00"; range, 200; system, composite, 1000; hours, 10-11 a. m. and 4-5 p. m., daily except Sunday.

<sup>2</sup> Loc. (approximately) O 88° 04' 00", N 45° 50' 00"; range, 150; system, composite, v. t. telegraph.

<sup>3</sup> Loc. (approximately) O 106° 55' 00", N 47° 19' 00"; range, 200; system, Western electric v. t. telegraph.

<sup>4</sup> Loc. O 88° 27' 30", N 46° 45' 30"; range, 200; system, 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, 1924, and to the International List of Radiotelegraph Stations published by the Berns Bureau]

Name of vessel	Call signal	Rates	Service	Hours	Owner of vessel	Station controlled by—
Beatrice <sup>1</sup> .....	KFSO	8	PG	X	A. H. Bull S. S. Co.....	I. W. T. Co.
Foam <sup>2</sup> .....	KFSR	8	PG	X	Anthony J. McAllister.....	Owner of vessel.
Jessie Fay.....	KPTH	.....	.....	.....	Hollywood Boat & Transportation Co.	.....
New York Central No. 18.	KFTQ	.....	PG	X	New York Central Railroad....	.....
Osprey.....	KUJN	.....	PG	X	Deep Sea Fisheries.....	Do.
Robert E. Lee.	WDT	.....	PG	.....	Robert E. Lee S. S. Corp.....	.....

<sup>1</sup> Range, 200; system, I. W. T. Co., 1000; w. l., 450, 600, 700, 800.

<sup>2</sup> Range, 150; system, R. C. A., 1000; w. l., 600.

*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
KEP	Glasgow, Mont.....c	KFTQ	New York Central No. 18.....b
KFO	Jordan, Mont.....c	KUJN	Osprey.....b
KFSO	Beatrice.....b	WCT	L'Anse, Mich.....c
KFSR	Foam.....b	WDT	Robert E. Lee.....b
KPTH	Jessie Fay.....b	WDY	Iron Mountain, Mich.....c

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*Broadcasting stations, alphabetically by names of States and cities*  
 [Additions to the List of Radio Stations of the United States, edition of June 30, 1924]

State and city	Call signal	State and city	Call signal
Arkansas: Hot Springs.....	KTBS	Maryland: Baltimore.....	WCBM
California:		Minnesota: Breckenridge.....	KFUJ
Pasadena.....	KPPC	Missouri: St. Louis.....	KFUO
San Francisco.....	KFUQ	Montana: Helena.....	KFCC
Colorado:		Nebraska: Hartington.....	KFRZ
Colorado Springs.....	KFUM	New Jersey: Atlantic City.....	WPG
Denver.....	KFUP	New Mexico: State College.....	KFRY
Do.....	KOA	New York:	
Connecticut: Hartford.....	WTIC	Freeport.....	WGBB
District of Columbia: Washington.....	WRHF	Jamestown.....	WOCL
Georgia: Atlanta.....	WDBE	Pennsylvania:	
Illinois:		Allentown.....	WSAN
Batavia.....	WORD	Philadelphia.....	WFBF
Chicago.....	WBCN	Philippine Islands:	
Galesburg.....	WFBZ	Manila.....	KZKQ
Indiana:		Do.....	KZUY
Evansville.....	WGBF	South Carolina: Greenville.....	WGBT
Fort Benjamin Harrison.....	WFBY	Texas:	
Seymour.....	WFBE	Galveston.....	KFUL
Kansas:		Houston.....	WRAA
Lawrence.....	KFKU	Virginia: Thrifton.....	WGBG
Manhattan.....	KSAC		

*Stations broadcasting market or weather reports, music, concerts, lectures, etc., alphabetically by call signals*

Call signal	Location of station	Station operated and controlled by--	Power (watts)	Wave length	Frequency (kilo-cycles)
KFCC	Helena, Mont.	First Congregational Church.....	10	248	1,210
KFKU	Lawrence, Kans.	University of Kansas.....	500	275	1,090
KFRY	State College, N. Mex.	New Mexico College of Agriculture and Mechanic Arts.....	50	286	1,130
KFRZ	Hartington, Nebr.	Electric Shop (P. M. Thies).....	15	222	1,350
KFUJ	Breckenridge, Mtan., 120 North Fifth St.	Hoppert Plumbing & Heating Co.....	50	242	1,240
KFUL	Galveston, Tex.	Thomas Goggan & Bros. Music Co.....	10	268	1,160
KFUM	Colorado Springs, Colo., Kiowa and Cascade Sts.	W. D. Corley.....	100	242	1,240
KFUO	St. Louis, Mo.	Concordia College.....	500	345	850
KFUP	Denver, Colo.	Fitzsimons General Hospital.....	50	234	1,280
KFUQ	San Francisco, Calif., 1380 Bust St.	Julius Brunton & Sons Co.....	5	324	1,280
KOA	Denver, Colo., 1370 Krameria St.	General Electric Co.....	1,000	328	930
KPPC	Pasadena, Calif.	Pasadena Presbyterian Church.....	50	329	1,310
KSAC	Manhattan, Kans.	Kansas State Agricultural College.....	500	341	890
KTBS	Hot Springs, Ark.	New Arlington Hotel Co.....	500	375	800
KZKQ	Manila, P. I., Manila Hotel.....	Far Eastern Radio (Inc.).....	500	222	1,360
KZUY	Manila, P. I., 800 M. H. del Pilar.....	F. Johnson Elser.....	500	370	812
WBCN	Chicago, Ill., 728 West Sixty-fifth St.	Foster & McDonnell.....	500	298	1,130
WCBM	Baltimore, Md., Charles St. and North Ave.	Hotel Chateau (Charles Schwartz).....	50	220	1,310
WDBE	Atlanta, Ga., 22 Luckie St.	Gilham-Schoen Electric Co.....	100	278	1,060
WFBE	Seymour, Ind., 308 West Second St.	John Van de Walle.....	20	236	1,330
WFBF	Philadelphia, Pa., Eighteenth St and Columbia Ave.	Gethsemane Baptist Church.....	5	234	1,280
WFBY	Fort Benjamin Harrison, Ind.	U. S. Army, Fifth Corps Area.....	100	258	1,160
WFBZ	Galesburg, Ill.	Knox College.....	10	254	1,180
WGBB	Freeport, N. Y., 217 Bedell St.	Harry H. Carman.....	100	244	1,240
WGBF	Evansville, Ind., 307 South Seventh St.	Finke Furniture Co.....	50	217.3	1,380
WGBG	Thrifton, Va., 25 Franklin St.	Breitenbach's Radio Shop.....	100	226	1,330
WGBT	Greenville, S. C.	Furman University.....	15	236	1,270
WOCL	Jamestown, N. Y.	Hotel Jamestown.....	15	275	1,090
WORD	Batavia, Ill.	Peoples Pulpit Association.....	500	278	1,080
WPG	Atlantic City, N. J.	Municipality of Atlantic City.....	500	296	1,010
WRAA	Houston, Tex.	Rice Institute.....	100	256	1,170
WRHF	Washington, D. C., 525 Eleventh St.	Washington Radio Hospital fund.....	50	256	1,170
WSAN	Allentown, Pa.	Allentown Call Publishing Co.....	10	229	1,310
WTIC	Hartford, Conn.	Travelers Insurance Co.....	500	340	860

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*Government land stations, alphabetically by names of stations*

Additions to the List of Radio Stations of the United States, edition of June 30, 1924, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Station	Call signal	Wave lengths	Service	Hours	Station controlled by—
Akiak, Alaska.....	WWF		O	X	Bureau of Education, Department of the Interior.
St. George, Alaska (Pribilof Islands.) <sup>1</sup>	WWD	308, 340, 600, 675, 952.	FX	X	Bureau of Fisheries, De- partment of Com- merce.

<sup>1</sup> Loc. O 169° 32' 40", N 56° 36' 10"; system, v. t. telephone.

*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
WWD	St. George, Alaska.....c	WWF	Akiak, Alaska.....c

*Special land stations, alphabetically by names of stations*

[Additions to the List of Radio Stations of the United States, edition of June 30, 1924]

Station	Call signal	Station controlled by—
Buffalo, N. Y.....	8XAB	Seneca Vocational School.
Canton, N. Y.....	8XF	St. Lawrence University.
Davenport, Iowa.....	9XG	Palmer School of Chiropractic.
Eugene, Oreg.....	7XG	University of Oregon.
Granville, Ohio.....	8XW	Denison University (Richard H. Howe).
Mason, Ohio.....	8XAA	United States Playing Card Co.
New York, N. Y.....	2XH	Greely Square Hotel Co. (Hotel McAlpin).
West Lafayette, Ind.....	9XE	Purdue University.

*Special land stations grouped by districts*

Call signal	District and station	Call signal	District and station
2XF 7XG	Second district: New York, N. Y. Seventh district: Eugene, Oreg.	8XW	Eighth district—Continued. Granville, Ohio.
8XAA 8XAB 8XF	Eighth district: Mason, Ohio. Buffalo, N. Y. Canton, N. Y.	9XE 9XG	Ninth district: West Lafayette, Ind. Davenport, Iowa.

## 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, 1924, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

BALABAC, P. I.—Hours, Sunday and holiday add 2-3.30 p. m.

BALTIMORE, MD. (WLL).—W. l., 600, 875.

BOLINAS, CALIF. (KET).—System, add General Electric v. t. telegraph; w. l., add 99.

BOLINAS, CALIF. (KPH).—W. l., 600, 2200.

BUFFALO, N. Y.—W. l., 600, 730, 1764, 1800.

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CHICAGO, ILL. (WGO).—W. l., 600, 890, 1800.  
 CLEVELAND, OHIO (WTK).—W. l., 600, 730, 1764, 1800.  
 DEARBORN, MICH.—W. l., 140, 143, 600, 1713, 1875.  
 EAST PITTSBURGH, PA.—W. l., add 58.79.  
 JACKSON, OHIO—W. l., 1743  
 LUDINGTON, MICH.—System, R. C. A. arc and R. C. A., 1000; w. l., 600, 1666.  
 MALABANG, P. I.—Hours, Sunday and holiday add 2-3.30 p. m.  
 MARTINSVILLE, ILL.—System, De Forest v. t. telephone and telegraph.  
 NEW YORK, N. Y. (WHI).—System, Federal arc and R. C. A., 1000; hours, X.  
 NORTHVILLE, MICH.—W. l., 1910.  
 PALM BEACH, FLA.—Range, 200-300; system, R. C. A., 1000 and composite, 1000; w. l., 600, 650.  
 ROGERS, MICH.—Call signal changed to WLC.  
 SPRINGFIELD, OHIO.—W. l., 1910  
 SAN VICENTE, P. I.—Read San Vicente, P. I., hours, Sunday and holiday change to 9-12 to 9-11 a. m.  
 SURIGAO, P. I.—Hours, ship schedule last 10 minutes of each hour.  
 Strike out all particulars of the following-named stations: Benton Harbor, Mich.; Dillard, Okla.; Newark, N. J.; Parsons, Kans.

## COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS

[Alterations and corrections to be made to the List of Radio Stations of the United States, editions of June 30, 1924, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

A. C. BEDFORD.—W. l., 450, 600, 706, 800.  
 ALBERT JEFFRESS.—W. l., 450, 600, 706, 800.  
 ALGONQUIN.—W. l., 450, 600, 706, 800.  
 AQUARIUS.—W. l., 450, 600, 706, 800.  
 AQUIDABAN.—Name changed to Transford II.  
 BARWICK.—George H. Crofton owner of vessel.  
 BAYOU CHICO.—W. l., 450, 600, 706, 800.  
 BIENVILLE.—Range, 300; system, R. C. A., 1000; w. l., 600, 706, 800, 875; rates, 8 cents per word; station operated and controlled by owner of vessel.  
 BIRAN.—Name changed to Dorothy; A. H. Bull S. S. Co. owner of vessel.  
 CADARETTA.—Station operated and controlled by I. W. T. Co.  
 CARIBBEAN.—Range, 200; w. l., 300, 950; hours, N.  
 CAROLYN FRANCES.—H. Liebes & Co. owner of vessel.  
 CHARLES PRATT.—W. l., add 706, 800.  
 COKEBIT.—W. l., 450, 600, 730, 800, 875; station operated and controlled by I. W. T. Co. (U. S. L.).  
 DARIEN.—System, Navy v. t. telephone; w. l., 150, 600; service, P; hours, N.  
 DOMINO.—W. l., 450, 600, 706, 800.  
 EL CID.—System, R. C. A., 1000; w. l., 600, 706, 800.  
 FAVORITE (KDNY).—Range, 300; system, Navy arc, Navy spark, 1000 and Navy v. t. telephone; w. l., 150, 450, 600, 1800, 2400; service, P; hours, N.  
 GENESEE.—Sylvanus Stokes, jr. owner of vessel.  
 GLYMONT.—Station operated and controlled by I. W. T. Co.  
 GORGONA.—Range, 150; w. l., 300, 450, 600; service, P; hours, N; station operated and controlled by owner of vessel.  
 HENRY D. WHITON.—Range, 150; w. l., 600, 706, 800; station operated and controlled by I. W. T. Co.  
 HOLLYWOOD.—W. l., 450, 600, 706, 800.  
 J. A. BOSTWICK.—I. W. T. Co. arc and Lowenstein 1000; w. l., 600, 706, 730, 800, 2100, 2400.  
 KINGFISHER.—Wabash Transpn. Co. owner of vessel.  
 LAS VEGAS.—W. l., 450, 600, 706, 800.  
 LUXPALILE.—W. l., 450, 600, 706, 800.  
 MALABAR.—W. l., 600, 706, 800, 2100, 2400.  
 MINNESOTA.—George S. Bennett, owner of vessel.  
 MUSKOGEE.—Range, 150; system, Navy-Lowenstein, 1000; w. l., 600, 706, 800.  
 NEW BRITAIN.—W. l., 450, 600, 706, 800.  
 NORLINA.—W. l., 450, 600, 706.  
 NORMA.—System, Navy-R. C. A., 1000; w. l., 600, 706, 800.  
 PARIÁ.—Station operated and controlled by I. W. T. Co.  
 PIONEER (KUSS).—Stuart Corp. owner of vessel.  
 POINT LOBOS.—Swayne & Hoyt owner of vessel; station operated and controlled

SAGADAHOC.—W. l., 600, 706, 800.  
 SAN JOSE.—W. l., 600, 706, 800; hours, N.  
 SANTA CLARA.—System, R. C. A., 1000; w. l., 450, 600, 706, 800.  
 SANTA MALTA.—W. l., 450, 600, 706, 800.  
 SANTA VERONICA.—Station operated and controlled by I. W. T. Co.  
 SAUGERTIES.—Station operated and controlled by S. O. R. S.  
 STEEL RANGER.—W. l., 450, 600, 706, 800.  
 SUCARSECO.—Submarine Boat Corp. owner of vessel.  
 SUEANA II.—Call signal changed to KZAW, w. l., 300, 600, 800.  
 TAVERNILLA.—Range, 150; system, Navy, 1000; w. l., 300, 450, 600; service, P; hours, N; station operated and controlled by owner of vessel.  
 THALASSA.—Range, 75; system, Marconi, 1000; w. l., 300, 450, 600, 800; Eugen Higgins, owner of vessel; station operated and controlled by owner of vessel.  
 VIKING.—W. l., 600, 800.  
 VINCENT.—W. l., 450, 600, 706, 800.  
 WESTBORO.—Correct call signal KDJH (U. S. L.).  
 WEST ISLETA.—W. l., 450, 600, 706, 800, 875.  
 WEST NOHNO.—W. l., 450, 600, 706, 800.  
 WEST NOMETUM.—W. l., 450, 600, 706, 800.  
 WEST NOSSKA.—W. l., 450, 600, 706, 800, 875.  
 WEST SEGOVIA.—W. l., 450, 600, 706, 800.  
 WILLIAM A. MCKENNEY.—W. l., 600, 706, 800.  
 WILLIAM CAMPION.—W. l., 600, 706, 800.  
 WM. ROCKEFELLER.—W. l., 450, 600, 706, 800.

Strike out all particulars of the following-named vessels: Alicia, Allianca, Anniston, Avondale, Bacoi, Barrallton, Bathalum, Baton Rouge (KSG), Bernice, Blue Hill, Brabant, Brockton, Burnwell, Calno, Carib (KUZX), Charles L. O'Connor, City of Augusta, City of Dallas, Commercial Courier, Cora F. Cressy, Covalt, Covena, Craigsmere, Cricket, Cristina, Cushnet, Cuttyhunk, Director, Dochra, Dunmore, E. G. Crosby, Esperanza, Farnam, Fort Bragg, Fourth Alabama, General H. F. Hodges, Georgia (WFA), Gold Star, Hancock County, Hisko, Holbrook, Humboldt, Hutchinson, J. B. John, Jim Sid, John F. Hylan, Josiah Macy, Kaleen, Keshena, Kingfisher, Knoxville, Lackawanna Bridge, Lake Aurice, Lake Benbow, Lake Benton, Lake Berdan, Lake Callicoon, Lake Capens, Lake Conesus, Lake Dancey, Lake Daraga, Lake Desha, Lake Dwyer, Lake Ellendale, Lake Ellijay, Lake Fairlie, Lake Fairport, Lake Falamia, Lake Farlin, Lake Festina, Lake Festus, Lake Fithian, Lake Flagstaff, Lake Flynus, Lake Forkville, Lake Fossil, Lake Foxcraft, Lake Fraichur, Lake Franconia, Lake Frenchton, Lake Frio, Lake Furley, Lake Giltedge, Lake Gorin, Lake Govan, Lake Grama, Lake Granby, Lake Indian, Lakeland, Lake Lasang, Lake Linden, Lake Marion, Lake Ormoc, Lake Otsquago, Lake Sanford, Lake Superior, Lake Wimico, Lakewood, L. D. Potter, Leyden, Louisville Bridge, Maruba, Minnewawa, Moffitt, Moshico, Neptune, Nereus, Noddle Island, Northwestern Bridge, Nueces, Overbrook, Peconic, Pere Marquette S, Phoenix, P. J. Reilly, Restless, Ripple (KDUN), St. Augustine, Sandcraft, Santanta, Sequoia, Silverbrook, Star 1, Tekoa, Thomas J Howard, Tollard, Tuladi, West Conob, West Shore, Wm. Boyce Thompson, Wyandotte (WJW).

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS

KEMG, changed to KZAW; KFOS, read Transford II; KKOA, read Dorothy; KZAG, read San Vicente; WHT, changed to WLC; strike out all particulars following the call signals, KDAF, KDHS, KDIT, KDJC, KDME, KDMY, KDNJ, KDPZ, KDUN, KDYF, KEBM, KECV, KEFP, KEGL, KEH, KEJG, KEJL, KEMM, KEMP, KEPN, KEQP, KERM, KEVX, KEX, KFEA, KFGW, KFJ, KFSJ, KFTE, KFTX, KGL, KIBC, KIDB, KIDM, KIDP, KIDT, KIFP, KIGJ, KIGM, KIJN, KIKJ, KIMS, KINL, KINV, KIQT, KISP, KITB, KITR, KITV, KIVP, KIXJ, KIZM, KJU, KKAU, KLAE, KLEO, KLUA, KMA, KMUA, KOBL, KOBX, KOGC, KOGR, KOKV, KOKZ, KONB, KONC, KONK, KOPG, KOPV, KORT, KOXF, KOXL, KPG, KQIE, KRIA, KSAO, KSG, KSIU, KSOI, KSZ, KUJP, KUKK, KUN, KUSM, KUU, KUZB, KUZD, KUZX, KVAE, KVUA, KWJ, KWZ, KXAO, KXEE, KXEI, KZAE, KZAL, KZB, KZC, KZEE, KZEI, KZEO, KZIA, KZOO, KZR, KZS, WAK, WCUE, WCUO, WDI, WDL, WFA, WFUE, WIZ, WJEO, WJW, WJZ, WLEI, WLEI, WMAA, WMD, WMDA, WNAO, WBY, WOH, WOH, WRIO, WRIO, WSEL, WTAE, WTOO.

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## BROADCASTING STATIONS, BY CALL SIGNALS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1924]

- KDYL (Salt Lake City, Utah).—Power, 50; w. l., 250; frequency, kc. 1,200.  
 KFAU (Boise, Idaho).—Power, 500; w. l., 275; frequency, kc. 1,090.  
 KFBU (Laramie, Wyo.).—W. l., 270; frequency, kc. 1,110; station operated and controlled by Bishop N. S. Thomas, 301 Thornburg Street.  
 KFCF (Walla Walla, Wash.).—W. l., 256; frequency, kc. 1,170.  
 KFFV (Lamoni, Iowa).—W. l., 250; frequency, kc. 1,200.  
 KFGZ (Berrien Springs, Mich.).—Call signal changed to WEMC.  
 KFIF (Portland, Oreg.).—W. l., 248; frequency, kc. 1,210.  
 KFMQ (Fayetteville, Ark.).—Power, 500; w. l., 275; frequency, kc. 1,090.  
 KFNJ (Helena, Mont.).—Power, 50; w. l., 248; frequency, kc. 1,210; station operated and controlled by V. Kemp Roberts, 40 Olive Street.  
 KFOJ (Moberly, Mo.).—Station operated and controlled by Moberly High School.  
 KFOY (St. Paul, Minn.).—W. l., 252; frequency, kc. 1,190.  
 KFQC (Taft, Calif.).—W. l., 231; frequency, kc. 1,300.  
 KFQC (Los Angeles, Calif.).—Power, 50; w. l., 229; frequency, kc. 1,310.  
 KFRC (San Francisco, Calif.).—Power, 50; w. l., 278; frequency, kc. 1,080.  
 KFRH (Grafton, N. Dak.).—Station operated and controlled by the Radio Shop (Martin L. Monson).  
 KGB (Tacoma, Wash.).—W. l., 250; frequency, kc. 1,200.  
 KFGC (Baton Rouge, La.).—W. l., 268; frequency, kc. 1,120.  
 KGO (Oakland, Calif.).—Power, 1,500.  
 KJS (Los Angeles, Calif.).—Power, 500; w. l., 252; frequency, kc. 1,190.  
 KOP (Detroit, Mich.).—W. l., 278; frequency, kc. 1,090.  
 KQW (San Jose, Calif.).—W. l., 240; frequency, kc. 1,250.  
 WAAW (Omaha, Nebr.).—W. l., 278; frequency, kc. 1,080.  
 WABM (Saginaw, Mich.).—Power, 20; w. l., 261; frequency, kc. 1,150.  
 WABO (Rochester, N. Y.).—Power, 100; w. l., 278; frequency, kc. 1,080.  
 WABR (Toledo, Ohio).—W. l., 263; frequency, kc. 1,140.  
 WABW (Wooster, Ohio).—W. l., 206.8; frequency, kc. 1,450.  
 WABX (Mount Clemens, Mich.-near).—Power, 50; w. l., 254; frequency, kc. 1,180.  
 WBAO (Decatur, Ill.).—Power, 100.  
 WBAX (Wilkes-Barre, Pa.).—W. l., 256; frequency, kc. 1,170.  
 WBBA (Newark, Ohio).—W. l., 226; frequency, kc. 1,330.  
 WBBH (Port Huron, Mich.).—W. l., 205.4; frequency, kc. 1,460.  
 WBBP (Petoskey, Mich.).—Power 5-100; w. l., 214.2; frequency, kc. 1,400.  
 WCAH (Columbus, Ohio).—Power, 200; w. l., 266; frequency, kc. 1,130.  
 WCAR (San Antonio, Tex.).—W. l., 263; frequency, kc. 1,140.  
 WCAV (Little Rock, Ark.).—W. l., 263; frequency, kc. 1,140.  
 WCBI (Bemis, Tenn.).—Power, 150.  
 WCBR (Providence, R. I.-portable).—Power, 30.  
 WCBU (Arnold, Pa.).—W. l., 220; frequency, kc. 1,340.  
 WCK (St. Louis, Mo.).—W. l., 273; frequency, kc. 1,100.  
 WDBS (Dayton, Ohio).—W. l., 275; frequency, kc. 1,090.  
 WDZ (Tuscola, Ill.).—Power, 10-100.  
 WEAJ (New York, N. Y.).—Power, 2,000.  
 WEAH (Wichita, Kans.).—W. l., 268; frequency, kc. 1,120.  
 WEAJ (Ithaca, N. Y.).—W. l., 254; frequency, kc. 1,180.  
 WEAJ (Vermilion, S. Dak.).—W. l., 278; frequency, kc. 1,080.  
 WEBO (Hamilton, Ohio).—W. l., 252; frequency, kc. 1,190.  
 WEBT (Dayton, Ohio).—W. l., 256; frequency, kc. 1,170.  
 WEBZ (Savannah, Ga.).—W. l., 234; frequency, kc. 1,280.  
 WFBG (Altoona, Pa.).—W. l., 278; frequency, kc. 1,080.  
 WFBL (Syracuse, N. Y.).—W. l., 252; frequency, kc. 1,190.  
 WGY (Schenectady, N. Y.).—Power, 1,500.  
 WHAD (Milwaukee, Wis.).—Power, 500; w. l., 275; frequency, kc. 1,090.  
 WHAM (Rochester, N. Y.).—W. l., 278; frequency, kc. 1,080.  
 WJAD (Waco, Tex.).—Power, 500; w. l., 353; frequency, kc. 850.  
 WJAG (Norfolk, Nebr.).—W. l., 270; frequency, kc. 1,110.  
 WJAN (Peoria, Ill.).—W. l., 273; frequency, kc. 1,100.  
 WJAS (Pittsburgh, Pa.).—W. l., 275; frequency, kc. 1,090.  
 WJD (Cincinnati, Ohio).—W. l., 217.8; frequency, kc. 1,200.

WMAN (Columbus, Ohio).—W. l., 278; frequency, kc. 1,080; station operated and controlled by First Baptist Church (W. E. Heskett).  
 WNAP (Springfield, Ohio).—W. l., 248; frequency, kc. 1,210.  
 WPAB (State College, Pa.).—Call signal changed to WPSC; W. l., 261; frequency, kc. 1,150.  
 WPAK (Agricultural College, N. Dak.).—W. l., 275; frequency, kc. 1,090.  
 WPAZ (Charleston, W. Va.).—W. l., 268; frequency, kc. 1,120.  
 WQAS (Lowell, Mass.).—W. l., 252; frequency, kc. 1,190.  
 WRAF (Laporte, Ind.).—Power, 15.  
 WRAV (Yellow Springs, Ohio).—W. l., 263; frequency, kc. 1,140.  
 WREO (Lansing, Mich.).—W. l., 286; frequency, kc. 1,050.  
 WRR (Dallas, Tex.).—Power, 200; w. l., 261; frequency, kc. 1,150.  
 WTAC (Johnstown, Pa.).—W. l., 209.7; frequency, kc. 1,430.  
 WTAY (Oak Park, Ill.).—W. l., 250; frequency, kc. 1,200.  
 WWI (Dearborn, Mich.).—W. l., 266; frequency, kc. 1,130.  
 Strike out all particulars of the following-named stations: KDZR, Bellingham, Wash.; KFAV, Medford, Oreg.; KFBE, San Luis Obispo, Calif.; KFBS, Trinidad, Colo.; KFKZ, Colorado Springs, Colo.; KFOF, Marshfield, Oreg.; KFPN, Jefferson City, Mo.; KFPO, Denver, Colo.; KFQK, Fayette, Mo.; KFQO, Russell, Kans.; KFRG, St. Louis, Mo.; KFRI, Denver, Colo.; KGG, Portland, Oreg.; KQP, Hood River, Oreg.; KYF, Wichita, Kans.; WABP, Dover, Ohio; WBL, Anthony, Kans.; WEBU, De Land, Fla.; WIAB, Rockford, Ill.; WPAR, Beloit, Kans.; WQAF, Sandusky, Ohio; WQAX, Peoria, Ill.

#### 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 30, 1924, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

BAR HARBOR, ME. (R. C.).—Call signal changed to NQC., effective February 1, 1925.  
 BIRD ISLAND, CALIF.—Strike out all particulars.  
 COLUMBIA RIVER LIGHT VESSEL (fog signal).—Transmission of fog signal changed to 3 dashes for 60 seconds, silent 30 seconds.  
 DEER ISLAND, MASS.—Call signal changed to NWM, effective February 1, 1925.  
 DETOUR POINT, MICH.—W. l., add 600.  
 EUREKA, CALIF.—W. l., 3039 changed to 3156.  
 FIRE ISLAND, N. Y.—Call signal changed to NJY, effective February 1, 1925.  
 FOURTH CLIFF, MASS.—Call signal changed to NWM, effective February 1, 1925.  
 GUANTANAMO BAY, CUBA.—W. l., 2701 changed to 2726.  
 KEY WEST, FLA. (regular station, NAR).—W. l., 5757 changed to 5657.  
 MANASQUAN, N. J.—Call signal changed to NJY, effective February 1, 1925.  
 NORTH TRURO, MASS.—W. l., add 600.  
 PRICES NECK, R. I.—Call signal changed to NGO, effective February 1, 1925.  
 SANDY HOOK, N. J.—Call signal changed to NJY, effective February 1, 1925.  
 TATOOSH, WASH.—W. l., add 600.  
 THATCHER ISLAND, MASS.—Call signal changed to NWM, effective February 1, 1925.  
 WASHINGTON, D. C. (Arlington, Va., NAA).—W. l., 2653 changed to 2655.

#### GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS

NAD, changed to NWM (Deer Island, Mass., Fourth Cliff, Mass., Thatcher Island, Mass.); NAF, changed to NGO; NAH, changed to NJY (Fire Island, N. Y.; Manasquan, N. J., Sandy Hook, N. J.); NBB, changed to NQC; NLD, strike out all particulars. The changes in the naval call signals are effective February 1, 1925.

#### 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, 1924]

BUFFALO, N. Y. (8XN).—Station operated and controlled by Federal Telephone Mfg. Co.  
 EAST PITTSBURGH, PA. (8XAU).—Call signal changed to 8XK.  
 BENTON POLYGRAPH, OREG. (7YK).—Station operated and controlled by Benson Poly-



## RADIO SERVICE BULLETIN

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STEVENSVILLE, MONT. (near-7XAF).—Changed to Portland, Oreg., address care of Ralph Schneeloch, Lumberman's Building.  
Strike out all particulars of the following-named stations: Buffalo, N. Y. (8YP); El Monte, Calif. (6XAX); Granville, Ohio (8YM); Houghton, Mich. (9XAY); New York, N. Y. (2XK); St. Louis, Mo. (9YAB); Springdale, Conn. (1XAK); West Lafayette, Ind. (9YB).

## MISCELLANEOUS

*Details of time, weather, press, and hydrographic bulletin schedules transmitted by naval radio stations*

Name of station	Call signal	Wave length	Type of emission	Time (75th meridian)	Nature of service
Annapolis, Md. (Washington, D. C.)	NBS	17,130	Arc.....	1155 1700 2155	Time. Ice report. Time, press.
Arlington, Va. (Washington, D. C.)	NAA	2,665	V. t. c. w.	2030 1155 2155	Weather, hydrographic. Time, storm warnings. Time, weather, hydrographic, press.
Balboa, Canal Zone	NBA	6,663	Arc.....	0455 1255	Time, press, hydrographic. Time, hydrographic.
Boston, Mass.	NAD	1,363	V. t. c. w.	1100 1155 1700	Weather, hydrographic. Time, if Arlington fails. Weather, hydrographic.
Brownsville, Tex.	NAY	2,234	Spark.....	0000 1200 1900	Weather. Do. Do. <sup>1</sup>
		4,997	Arc.....	0600 1200 1900	Do. Do. Do. <sup>1</sup>
Cavite, P. I.	NPO	3,290	..do.....	0100 0855 1400	Press. Time, weather, hydrographic. Press.
		2,701	Spark.....	2155 0855 2155	Time, weather, hydrographic. Do. Do.
Charleston, S. C.	NAO	2,607	V. t. c. w.	1030 1155	Weather, hydrographic. Time, if Arlington fails.
Colon, Canal Zone	NAX	1,817	Spark.....	1800 0455 1265	Weather, hydrographic. Time, hydrographic, press. Time, hydrographic.
Detour Point, Mich.	NZU	600	..do.....	1100 1715	Hydrographic. Do.
Dutch Harbor, Alaska	NPR	2,254	..do.....	0030 1230	Weather. Do.
Eureka, Calif.	NPW	3,156	V. t. c. w.	1200 1455 1700	Weather, hydrographic. Time. Weather, hydrographic.
				2030	Do.
Great Lakes, Ill.	NAJ	4,685	Arc.....	1045 1700	Hydrographic. Do.
		1,956	V. t. c. w.	1045 1100 1155 1715	Weather. Hydrographic. Time. Hydrographic.
				2300	Weather.
Guantanamo Bay, Cuba	NAW	2,726	Spark.....		Hurricane warnings as issued and repeated every 4 hours.
Honolulu, Hawaii (Pearl Harbor)	NPM	2,254	..do.....	0130 1230 1730	Weather, hydrographic. Do. Do.
				1855	Time.
Jupiter, Fla.	NAQ	11,490	Arc.....	1855	Do.
		1,304	Spark.....	1130	Weather.
				1800	Do. <sup>1</sup>
Key West, Fla.	NAR	1,463	V. t. c. w.	1155 1200 2200	Time. Weather. Do.
		5,657	Arc.....	2200	Do.
New Orleans, La.	NAT	2,607	V. t. c. w.	1100 1155 1700	Weather, hydrographic. <sup>1</sup> Time. Weather, hydrographic.
				1080	Weather.
Newport, R. I.	NAF	2,607	Arc.....	1155	Time, if Arlington fails.
New York, N. Y.	NAH	1,538	V. t. c. w.	1030 1155 1700	Weather, hydrographic. Time, if Arlington fails. Weather, hydrographic.

Details of time, weather, press, and hydrographic bulletin schedules transmitted by  
naval radio stations—Continued

Name of station	Call signal	Wave length	Type of emission	Time (75th meridian)	Nature of service
Norfolk, Va.....	NAM	1,368	V. t. c. w.	0830 1045 1155 1400 1600 2000	Weather. Weather, hydrographic. Time, if Arlington falls. Weather, hydrographic. Weather.
North Head, Wash.....	NPE	1,395 2,720	do. Spark	2030 0830 1230 1435 1630 2030	Do. <sup>1</sup> Do. Do. Time. Weather, hydrographic. Weather.
North Truro, Mass.....	NZU	600	do.	2330 0800 1700	Weather, hydrographic. Hydrographic. Do.
Pensacola, Fla.....	NAS	1,333	V. t. c. w.	1145 1600	Weather. Do. <sup>1</sup>
Philadelphia, Pa.....	NAI	1,300	do.	1045 1700	Weather, hydrographic. Do.
Port au Prince, Haiti.....	NSC	2,254	Spark		Hurricane warnings as issued and repeated every 4 hours.
Portland, Me. (Cape Elizabeth).	NAB	1,090	do.	1200 2000	Weather. Do.
Puget Sound, Wash.....	NPC	2,499	V. t. c. w.	0800 1200 1600 2000 2300 2800	Do. Weather, hydrographic. Do. Weather. Hydrographic. Weather.
San Diego, Calif.....	NPL	9,798 1,538	Arc. V. t. c. w.	0500 1455 0100 1100 1130 1500	Press. Time. Hurricane warnings (also at other times upon receipt). Do. Weather. Hurricane warnings (also at other times upon receipt).
San Francisco, Calif.....	NPG	4,835 7,005 1,335	Arc. do. V. t. c. w.	1455 1700 2300 0055 0415 1455 1200 2230 0055 0100 0300 0415 0700 1100 1455 1800 1900 2230 2300	Time. Press. Time. Weather, hydrographic. Do. Time. Weather, hydrographic. Bonita Channel weather. Press. Bonita Channel weather. Do. Time. Bonita Channel weather. Do. Weather, hydrographic. Bonita Channel weather.
San Juan, P. R.....	NAU	4,838 2,855	Arc. Spark	1945 2100	Weather. Do. <sup>1</sup>
Savannah, Ga.....	NEV	1,428	do.	1100 1800	Do. Do. <sup>1</sup>
St. Augustine, Fla.....	NAP	2,342	do.	1130	Do.
St. Croix, Virgin Islands.....	NNI	450	do.		Hurricane warnings as issued and repeated every 4 hours.
St. Thomas, Virgin Islands.	NBB	1,685	do.		Do.
Tatoosh, Wash.....	NPD	600	do.	0800 1200 1600 2000 2300	Weather. Do. Do. Do. Do.
Tutuila, Samoa.....	NPU	2,254	do.	0230 1430 1830 2230	Hydrographic. Do. Do. Do.

<sup>1</sup> Hurricane warnings are issued and repeated every 2 hours.

NOTE.—All naval time signals are made in a standard manner, which is as follows: The signals begins 5 minutes before the hour to be marked and consists of a dot for each second. The dot for the twenty-ninth second of each minute is omitted, and also the last 5 seconds of the first 4 minutes. The last 10

## RADIO SERVICE BULLETIN

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## COLUMBIA RIVER LIGHT VESSEL FOG SIGNAL TRANSMISSION CHANGED

The method of transmission of the signal at this station has been changed to 3 dashes for 60 seconds, silent 30 seconds.

## REGULATIONS GOVERNING THE OPERATION OF AMATEUR STATIONS

[General letter No. 265, December 24, 1924, to supervisors of radio and owners of amateur radio stations]

**Wave lengths.**—150 to 200, 75 to 85.7, 37.5 to 42.8, 19.7 to 21.4, and 4.69 to 5.35 meters are allocated to amateur stations.

**Spark transmitters.**—Amateur spark transmitters produce considerable interference and consequently are responsible for many complaints. Amateur owners of such transmitters should abandon their use as early as possible and adopt a system producing less interference. Until such change is made they will be permitted in the wave length band between 170 and 180 meters and should have a decrement not exceeding 0.1.

**Phone and ICW transmitters.**—Phone and ICW (interrupted continuous wave) transmitters will be permitted in the band from 170 and 180 meters. ICW shall be defined as the type of wave produced by mechanically interrupting one or more of the radio frequency circuits or the type of wave produced by any transmitting set which produces an equivalent effect.

**CW transmitters.**—CW (continuous wave) transmitters will be permitted in all of the bands allocated for amateur use.

**Coupled circuits.**—Amateur stations must use circuits loosely coupled to the radiating system, or devices that will produce equivalent effects to minimize key impacts, harmonics, and plate supply modulations, except in cases where loops are used as radiators. Conductive coupling, even though loose, will not be permitted.

**Power supply.**—No restrictions will be imposed relative to the character of power supply, provided the emitted wave is sharply defined.

**Quiet hours.**—Amateur stations when using wave lengths between 150 and 200 meters are required to observe a silent period from 8 to 10.30 p. m. daily, standard time, and on Sundays while church service<sup>2</sup> are being broadcast. Such stations when using wave lengths below 85 meters and having a pure continuous<sup>3</sup> wave or where a full wave rectification is employed are not required to observe a silent period, provided no interference is caused other services.

**Station licenses.**—Licenses issued for amateur stations will authorize the use of any or all of the wave lengths allocated for amateur use, provided the transmitter meets the requirements of the above regulations. No alteration in the apparatus will be permitted which results in changing the character of the emitted wave, except under authority granted by the supervisor of radio.

**Intercommunication.**—Amateur stations are not permitted to communicate with commercial or Government stations unless authorized by the Secretary of Commerce, except in an emergency or for testing purposes. This restriction does not apply to communication with small pleasure craft, such as yachts and motor boats, which may have difficulty in establishing communication with commercial or Government stations.

**Special amateur station licenses.**—There being no further need for special amateur station licenses, owners of stations holding such licenses will be permitted to continue the use of their "Z" calls under regular amateur station licenses. No new "Z" calls will be issued. The privilege of using the wave lengths from 105 to 110 meters is withdrawn.

A. J. TYRER, Acting Commissioner.

Approved:

S. B. DAVIS,

Acting Secretary of Commerce.

## SCOPE OF WORK OF RADIO SERVICE, BUREAU OF NAVIGATION

The following table shows the inspection and licensing work performed yearly from 1914 to 1924, inclusive, and the number of persons employed in the field force:

June 30—	American ships equipped	American ships licensed	Inspections of American and foreign ships	Commercial operators licensed	Number of commercial and special land stations	Amateur stations licensed	Amateur operators licensed	Total field force
1914.....	555	203	6,484	339	83	2,137	1,172	20
1915.....	585	262	6,152	1,653	115	3,547	3,067	26
1916.....	604	444	7,236	1,278	182	4,942	4,199	28
1917.....	836	484	7,137	1,682	180	3,741	3,303	28
1918.....	1,478	392	5,575	1,816	.....	.....	.....	29
1919.....	2,312	978	5,160	1,645	.....	.....	.....	27
1920.....	2,808	1,158	5,419	4,452	254	5,719	6,103	25-45
1921.....	2,978	921	5,691	2,722	491	7,351	6,207	26
1922.....	2,773	1,174	6,071	3,136	1,086	9,523	8,920	35
1923.....	2,723	945	6,933	2,860	1,375	7,821	9,908	33
1924.....	2,741	1,382	7,727	3,370	1,802	8,203	9,545	53

## NOTICES TO MARINERS BY NORWEGIAN STATIONS

Important notices to mariners covering areas located outside the regular pilot districts will be broadcast either by Bergen radio station immediately after the

weather bulletins at 19<sup>h</sup> 30<sup>m</sup>. Notices may also be broadcast occasionally by Utaire, Ingoy, and Vardo stations. The notices are sent in plain language (English) and commence with the phrase "Urgent notices to mariners." In the case of the two first-mentioned stations, the notices are broadcast on the wave used for the weather bulletins, while the other stations use a wave length of 600 meters. The notices will be repeated daily for as long a period as may be found expedient.—From *Efterretninger for Sjøfarende 11 (485), Kristinia, November 30, 1924.*

INCREASE IN RATES FOR COAST STATIONS

Effective March 1, 1925, the rates for the stations named hereunder will be 52 centimes (gold) per word for ship-to-shore traffic:

Operated by R. C. A. Chatham, Mass. (WIM). Marion, Mass. (WCC). New York, N. Y. (WNY). San Francisco, Calif. (KPH). Tuckerton, N. J. (WSC). Wilmington, Calif. (KSE).	Operated by T. R. T. Co. Boston, Mass. (WBF). Burrwood, La. Fort Morgan, Ala.  Miami Beach, Fla.  Mobile, Ala. (WNN). New Orleans, La.	Operated by F. T. Co. Clearwater, Calif. (KOK). Hillsboro, Oreg. (KEK). San Francisco, Calif. (KFS, Beach Station).
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DECREASE IN RATES FOR STATIONS IN THE PHILIPPINE ISLANDS

The following-named stations of the Philippine insular government, open to general public service, now charge 6 cents (gold) per word for ship-to-shore traffic: Aparri, Balabac, Basco, Batangas, Bongao, Cagayan de Sulu, Calapan, Cebu, Culon, Cuyo, Davao, Iloilo, Isabela de Basilan, Jolo, Port Lebak, Legaspi, Malabang, Malangas, Malita, Mati, Puerto Princesa, San Francisco (Camotés), San Jose, San Vicente, Siasi, Surigao, Virac, and Zamboanga.

RADIO FOG SIGNAL AT FAERDER LIGHT STATION, CRISTIANIA FJORD CHANGED

The radio fog signal at Faerder Light Station has been changed and is now as given below:

TRW, TRW, TRW, V. V. V. . . . ., TRW, TRW, TRW (silent 5 seconds),  
35 seconds  
TRW, TRW, TRW, V. V. V. . . . ., TRW, TRW, TRW (silent 1 minute).  
35 seconds

The above-mentioned signal is made in thick or foggy weather in addition to the signal made on the fog siren. Vessels desiring the signal under other weather conditions may request through Tjome radio station that the signal be made and it will be transmitted for one-half hour. Approximate position, lat. 59° 01' 36" N., long. 10° 31' 54" E.—From *Bekjentsgjorelse fra Fyrdirektoren No. 23, Kristinia, November 21, 1924.*

RADIO FOG SIGNAL AT MARSTENEN LIGHT STATION, KORS FJORD CHANGED

The radio fog signal at Marstenen Light Station has been changed and is now as given below:

TSY, TSY, TSY, V. V. V. . . . ., TSY, TSY, TSY (silent 2 seconds),  
30 seconds  
TSY, TSY, TSY, V. V. V. . . . ., TSY, TSY, TSY (silent 1 minute).  
30 seconds

The above-mentioned signal is made in thick or foggy weather in addition to the signal made on the fog siren. Vessels desiring the signal under other weather conditions may request through Rundemannen radio station that the signal be made. After such request the signal will be transmitted for one-half hour. Approximate position, lat. 59° 01' 45" N., long. 10° 01' 00" E.—From *Rakke...*

## RADIO SERVICE BULLETIN

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## BUFFALO (N. Y.) STATION WAVE LENGTH CHANGED FOR WEATHER REPORTS

The wave length of the Inter City Radio Telegraph Co.'s station at Buffalo, N. Y. (WAM), has been changed to 730 meters, and hereafter all general broadcasting of weather forecasts and hydrographic information to lake vessels will be transmitted on this wave length. The general call to vessels when transmitting weather and hydrographic information is first made on 600 meters, and then the wave length is shifted to 730 meters.

## CHICAGO (ILL.) STATION TRANSMITS HYDROGRAPHIC INFORMATION

The Chicago (Ill.) station (WGO) of the Radio Corporation of America transmits hydrographic information on 890 meters, continuous wave, at 11 a. m. and 4 and 9 p. m., central standard time. This station will receive any message regarding hydrographic information addressed to "Gov. Hydro., Chicago," from any vessel without charge. The message will then be forwarded to the branch hydrographic office at Chicago. Masters of vessels are requested to make reports of their observations by this means.

## MASSAWA TIME SIGNALS TRANSMITTED ON NEW WAVE LENGTH

The radio time signals transmitted daily by Massawa on the western shore of the Red Sea (Eritrea), located in approximately lat.  $15^{\circ} 37' N.$ , long.  $39^{\circ} 29' E.$ , are transmitted at  $17^h. 00^m. 00^s.$  G. M. T. (astronomical) on 3,500 meters, spark. These signals are repeated at  $22^h. 00^m. 00^s.$  G. M. T. (astronomical) on a wave length of 9,400 meters, continuous wave.

## METHOD OF TRANSMITTING FOG SIGNALS AT SEAL ISLAND, CANADA, CHANGED

The radio fog signal station located at the southern end of Seal Island, Nova Scotia, in approximately lat.  $43^{\circ} 23' N.$ , long.  $66^{\circ} 01' W.$ , has been changed in that the phase of the automatic signal has been altered to a series of groups, each consisting of two dots and two dashes (. . - -), emitted for two minutes, followed by a silent interval of three minutes, thus:

<u>. . . . . etc.</u>	<u>Silent</u>
<u>2 minutes</u>	<u>3 minutes</u>

## METHOD OF TRANSMITTING FOG SIGNALS AT LURCHER SHOAL LIGHT VESSEL, BAY OF PUNDY, CANADA, CHANGED

The phase of the automatic radio fog signal transmitted by this vessel, located in approximately lat.  $43^{\circ} 48' N.$ , long.  $66^{\circ} 32' W.$ , has been changed to a series of groups, each consisting of one dot and three dashes ( . - - - ), emitted for two minutes, followed by a silent interval of three minutes, thus:

<u>. - - - . - - - etc.</u>	<u>Silent</u>
<u>2 minutes</u>	<u>3 minutes</u>

## LICENSING OF STATIONS

The attention of all concerned is called to the fact that application for new ship radio station license should be filed with the branch offices of this service when a change in ownership is made or when a change is made to the apparatus of the station. In the case of renewal of license application for renewal should be filed in ample time for the renewal to be issued by the time the outstanding license expires. Attention is also called to the fact that the station licenses should be returned to the bureau when stations are dismantled or closed for any other reason, in order that the call letters may be canceled and the stations dropped from the list of radio ship stations. This also applies to operators of broadcasting and

## COMPASS STATION ESTABLISHED AT FERROL, SPAIN

A radio compass station, known as Ferrol-Caranza, has been established at El Prado, situated at the head of Ensenada de Caranza on the eastern side of the town of Ferrol, in lat.  $43^{\circ} 29' 04''$  N., long.  $8^{\circ} 13' 06''$  W., call signal EBAW, wave length 450 meters. The method of procedure is as follows:

1. A ship desiring to obtain her bearing calls the D/F station on the 450-meter wave, and transmits

QTE?—What is my true bearing with respect to you.

2. The D/F station prepares to observe a bearing, and, when ready, replies with its call signal followed by K (— . —), together with a number which expresses the intensity of the signals received, according to the undermentioned scale:

code	meaning	code	meaning
1.	Hardly audible.	6.	Moderately good.
2.	Very faint, illegible.	7.	Good.
3.	Hardly legible.	8.	Strong.
4.	Weak.	9.	Very strong.
5.	Somewhat weak.		

3. The ship repeats her call signal for 50 seconds and awaits the result. These signals should be made slowly, the dashes being considerably prolonged.

4. The D/F station then gives the result of the observations in degrees ( $0^{\circ}$ — $359^{\circ}$  true), preceded by the time expressed in four figures—the first two of which indicate the hours and the last two the minutes.

5. If the D/F station is not satisfied with the observation, it will request the ship, by means of the signal  $\overline{UD}$ , to repeat the signals.

*Example*

6. Caranza D/F station (call signal EBAW) listens-out on the 450-meter wave. A ship (call signal EBC) requests it to take a bearing and signals in the following manner:

$\overline{VE}$  EBAW EBAW V EBC QTE  $\overline{AR}$ .

When ready to observe the bearing, EBAW replies:

$\overline{VE}$  EBC V EBAW K7.

EBC then transmits:

$\overline{VE}$  EBAW V EBC EBC, etc. (repeated for 50 sec.) EBC  $\overline{AR}$ .

If EBAW is not satisfied with the observation, it requests EBC to repeat, making:

$\overline{VE}$  EBC V EBAW  $\overline{UD}$ .

(Whereupon EBC repeats as before.)

If the observation is satisfactory and the result  $315^{\circ}$ , EBAW transmits:

$\overline{VE}$  EBC V EBAW 1BT 0905 QTE 315 EBAW  $\overline{AR}$ .

(1BT 0905 signifies that one bearing has been taken at 9.5 a. m.)

$\overline{VE}$  EBAW V EBC R  $\overline{VA}$ .

EBAW does not reply, and both stations resume their normal routine.

## COMPASS STATION ESTABLISHED AT NITON, ENGLAND

A radio compass station has been established at Niton, Isle of Wight, England, in approximately lat.  $50^{\circ} 35'$  N., long.  $1^{\circ} 17'$  W., call signal GNI, wave length 600 meters, range 100 miles. This station is open for service under the following conditions:

1. The charge for each bearing will be 5 shillings.

2. The reliable range of the station for D/F purposes is 100 miles; up to this range and within the sectors  $080^{\circ}$ – $020^{\circ}$   $120^{\circ}$ – $280^{\circ}$   $280^{\circ}$ – $080^{\circ}$  an accurate

The accuracy with which the bearings can be taken depends on the conditions outlined below; but, although all necessary precautions are taken in order that the bearings may be determined as accurately as possible, the administration can not accept any responsibility for the consequences of a bearing being inaccurate. The conditions which should be fulfilled for obtaining a bearing are to transmit consistently clear, steady signals, on a sharply tuned wave.

3. Bearings at distances exceeding 100 miles will be given if required, but the degree of reliability decreases as the range increases, especially at night.

4. Bearings in sectors other than those enumerated in (2) will be given, but will be definitely stated as "unreliable," because variable errors are experienced in such sectors.

5. Bearings at night are subject to variation and should be accepted with caution.

6. If a bearing is not of the highest order, it will be specified as "approximate."

7. If a satisfactory bearing can not be obtained, the station will inform the ship that conditions are unfavorable and that another call should be made later.

8. Procedure: (a) The ship calls Niton (GNI) on 600 meters; making the abbreviation "QTE?" = What is my true bearing from you? (b) Niton, when ready, answers the ship and sends K(— . —). (c) The ship makes her call signal for 60 seconds and awaits the result. (d) Niton replies, either by asking the ship to repeat, if not satisfied with the bearing, or by making the abbreviation "QTE" = Your bearing from me was ——— degrees, followed by a group of three figures (000—359) indicating the bearing in degrees from true north, measured clockwise, of the ship from Niton. (e) In all messages giving bearings the time is expressed in G. M. T. (civil) by the four-figure notation, the first two figures denoting the hour and the last two figures the minutes, with the day commencing at midnight and the hours reckoned from 00 to 23. (f) The ship on receiving the result repeats back the message to Niton, who will then acknowledge or repeat if necessary, and when satisfied that the ship has received the message correctly will make the "end of work" sign. This sign is repeated by the ship, indicating that the operation is finished.

#### Example 1

A ship, whose call signal is XYZ, requires a bearing from Niton. The following signals are exchanged on 600 meters:

Ship: CT GNI GNI de XYZ QTE? AR.

Niton: CT XYZ de GNI K AR.

Ship: CT GNI de XYZ XYZ XYZ etc. (for 60 seconds), XYZ AR.

Niton being satisfied that the true bearing is 235° makes:

CT XYZ XYZ de GNI 1 0945 (time) BT QTE 235 AR GNI.

Ship: CT GNI de XYZ 1 0945 BT QTE 235 AR XYZ.

Niton: XYZ de GNI R SK.

Ship: GNI de XYZ SK.

If GNI is not satisfied with the bearing, GNI asks XYZ to repeat thus:

CT XYZ de GNI UD AR.

XYZ complies by making:

CT GNI de XYZ XYZ etc. (for 60 seconds), XYZ AR.

Niton now being satisfied that the true bearing is 235° makes:

CT XYZ XYZ de GNI 1 0947 BT QTE 235 AR GNI.

Ship: CT GNI de XYZ 1 0947 BT QTE 235 AR XYZ.

Niton: CT XYZ de GNI R SK.

*Example 2*

A ship, call signal XYZ, desires a bearing from Niton. The procedure described in (8) (a), (b), (c) is followed.

Niton finds that the bearing is apparently  $072^\circ$ , but does not consider that the bearing obtained is of the highest order, and transmits:

$\overline{CT}$  XYZ XYZ de GNI 1 2208  $\overline{BT}$  QTE 072 approximate  $\overline{AR}$  GNI.

The procedure detailed in (8) (f) follows.

*Example 3*

A ship, call signal XYZ, desires a bearing from Niton. The procedure shown in (8) (a), (b), (c) is followed.

Niton finds that the bearing is apparently  $269^\circ$  and, as this is in one of the sectors in which variable errors are experienced, transmits:

$\overline{CT}$  XYZ XYZ de GNI 1 1428  $\overline{BT}$  QTE 269 unreliable  $\overline{AR}$  GNI.

The procedure detailed in (8) (f) follows.

*Example 4*

A ship, call signal, XYZ, desiring a bearing from Niton. The procedure described in (8) (a), (b), (c) is followed.

Niton, however, is unable to obtain a satisfactory bearing, so transmits:

$\overline{CT}$  XYZ XYZ de GN 1 0623  $\overline{BT}$  QTE conditions unfavorable, make another call later  $\overline{AR}$  GNI.

Ship:  $\overline{CT}$  GNI de XYZ R  $\overline{SK}$ .

Niton:  $\overline{CT}$  XYZ de GNI  $\overline{SK}$ .

#### THE USE OF THE ELECTRON TUBE PEAK VOLTMETER FOR THE MEASUREMENT OF MODULATION

In an article by Dr. C. B. Jolliffe, of the Bureau of Standards, which appeared in the December issue of the Journal of the Optical Society of America and Review of Scientific Instruments, under the title "The use of the electron tube peak voltmeter for the measurement of modulation," a method of using the electron tube voltmeter for the measurement of the per cent modulation of a radio-frequency current is given. In using this instrument it is necessary to measure the peak values of the unmodulated and modulated radio-frequency current. The per cent modulation can then be calculated. Data are given to show the reliability of the method. The primary use of this device is for making measurements for scientific studies, but it should also prove useful in a radio telephone transmitting station.

#### 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 frequency standards. There may be many other stations maintaining their frequency just as constant as these, but these are the only ones which reached the degree of constancy shown among the stations upon whose frequencies measurements were made in the bureau's laboratory. There is, of course, no guaranty that the stations named below will maintain the constancy shown. As a means of maintaining constant frequency the high-power, low-frequency alternator station listed below have speed regulators. Most of the broadcasting stations listed use frequency indicators (one-point wave meters) and maintain a maximum deflection of the frequency indicator throughout the transmission. These broadcasting stations with rare exceptions vary not more than 2 kilocycles from the assigned frequency. The transmitted frequencies from these stations can be utilized for standardizing



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Letter Circular No. 92, Radio Signals of Standard Frequencies and Their Utilization. A copy of that letter circular can be obtained by a person having actual use for it upon application to the Bureau of Standards, Washington, D. C.

Station	Owner	Location	Assigned frequency (kilo-cycles)	Period covered by measurements (months)	Number of times measured	Deviations from assigned frequencies noted in measurements	
						Average	Greatest since Nov. 20, 1924
N88	U. S. Navy	Annapolis, Md.	17.50	10	118	Per ct. 0.2	Per ct. 0.1
WGG	Radio Corporation of America.	Tuckerton, No. J.	18.86	16	125	.2	.2
WII	Do.	New Jersey	22.04	15	108	.2	.1
WSO	Do.	New Brunswick, N. J.	25.80	16	97	.3	.4
WWJ	Detroit News	Detroit, Mich.	580	16	49	.1	.2
WCAP	Chesapeake & Potomac Telephone Co.	Washington, D. C.	640	15	74	.1	.2
WRC	Radio Corporation of America.	do.	640	12	47	.1	.0
WSB	Atlanta Journal	Atlanta, Ga.	700	15	61	.2	.1
WGY	General Electric Co.	Schenectady, N. Y.	700	18	104	.1	.1
WBZ	Westinghouse Electric & Manufacturing Co.	Springfield, Mass.	800	8	20	.0	.0
KDKA	Do.	East Pittsburgh, Pa.	920	15	130	.1	.1

## REFERENCES TO CURRENT RADIO PERIODICAL 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 the professional radio engineer which have recently appeared in technical periodicals. 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," Circular No. 138, a copy of which may be obtained for 10 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C. Further information about these lists, availabilities of previous lists, and of the several periodicals is contained in the extended statement preceding the early lists as published in the RADIO SERVICE BULLETIN prior to April, 1923, and also in May and September, 1923.

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