DEPARTMENT OF COMMERCE

RADIO SERVICE BULLETIN

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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 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.
m = a. m. (12 m = midday).
s = p. m. (12 s = midnight).
Rates = Ship or coast charges in cents: c. = cents. (The rates in the international list are given in francs and centimes.)
I. W. T. Co. = Independent Wireless Telegraph Co.
R. C. A. = Radio Corporation of America.
S. O. R. S. = Ship Owners' Radio Service.
C. w. = Continuous wave.
I. c. w. = Interrupted continuous wave.
V. t. = Vacuum tube.
FX = Fixed station.
U. S. L. = After operating company denotes that the change applies only to the List of Radio Stations of the United States.

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Kc. = Kilocycles.
Fy. = Frequency.
A. c. = Alternating current.

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, 1923, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Station	Call signal	Wave length	Service	Hours	Station controlled by—
Alpena, Mich.[1]	WNO	300, 600, 750, 1790	PR	X	Huron Transportation Co.
Boston, Mass.[2]	WEY	146, 300, 600	P	X	Boston Fire Department.
Dearborn, Mich.[3]	WAV	300, 600, 1713	P	X	Ford Motor Co.
Hilo, Hawaii [4]	KLN	300, 550, 600	FX	X	Mutual Telephone Co.
Hunters Bay, Alaska[5]	KQI	300, 550, 600	FX	X	Northwestern Fisheries Co.
Kassan, Alaska [6]	KMC	300, 550, 600	FX	X	Do.
Kenai, Alaska [7]	KLD	300, 550, 600	FX	X	Do.
Kenai, Aslska [8]	KYZ	300, 450, 550, 600	P	X	Libby, McNeill & Libby.
"Kvichak" [9]	KVQ	300, 600, 600	FX	X	Alaska Packers Association.
Pottsville, Pa.[10]	WMB	1599	FX	X	Pennsylvania State Police.
Quadra, Alaska [11]	KOR	300, 550, 600	FX	X	Northwestern Fisheries Co.
Schumigan, Alaska [12]	KHI	300, 550, 600	FX		Pacific American Fisheries.
Uyak, Alaska [13]	KHV	300, 550, 600	FX	X	Northwestern Fisheries Co.
Wyandotte, Mich.[14]	WCV	300, 600, 750, 1790	PR	X	Wyandotte Transportation Co.

[1] Loc. (approximately) O. 83° 30′ 00″, N. 45° 05′ 00″; range, 200; system, composite, v. t. telegraph; communicates only with certain land and ship stations.
[2] Loc. O. 71° 03′ 51″, N. 42° 21′ 30″; range, 10; system, Western Electric v. t. telephone and telegraph; communicates only with fire boats.
[3] Loc. (approximately) O. 83° 14′ 00″, N. 42° 18′ 00″; range, 100; system, composite, v. t. telegraph.
[4] Loc. O. 155° 20′ 03″, N. 19° 31′ 25″; range, 150; system, composite, v. t. telegraph.
[5] Loc. (approximately) O. 132° 19′ 00″, N. 54° 52′ 20″; range, 150; system, R. C. A., 1000.
[6] Loc. (approximately) O. 132° 24′ 00″, N. 55° 32′ 00″; range, 150; system, R. C. A., 1000.
[7] Loc. (approximately) O. 151° 14′ 00″, N. 60° 32′ 45″; range, 150; system, R. C. A., 1000.
[8] Loc. (approximately) O. 151° 16′ 00″, N. 60° 32′ 00″; range, 200; system, Kilbourne & Clark, 1000.
[9] Loc. (approximately) O. 157° 00′ 00″, N. 59° 00′ 00″; range, 25; system, composite, 120; permanently moored scow in Koggiung River, Alaska.
[10] Loc. (approximately) O. 76° 12′ 00″, N. 40° 41′ 00″; range, 100; system, composite, v. t. telegraph.
[11] Loc. (approximately) O. 130° 44′ 00″, N. 55° 04′ 45″; range, 150; system, R. C. A., 1000.
[12] Loc. O. 160° 33′ 00″, N. 55° 12′ 48″; range, 150; system, Navy-R. C. A., 1000; hours, 6.30–9.30 p. m., local time.
[13] Loc. O. 154° 00′ 20″, N. 57° 38′ 10″; range, 150; system, R. C. A., 1000.
[14] Loc. O. 83° 09′ 06″, N. 42° 13′ 08″; range, 150; system, composite, v. t. telegraph; communicates only with certain land and ship stations.

Commercial ship stations, alphabetically by names of vessels

[Additions to the List of Radio Stations of the United States, edition of June 30, 1923, 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—
A. A. Augustus [1]	KDXQ		PG	X	Pioneer S. S. Co	Owner of vessel.
Alaska Packers Association vessels general call.	KFVV				Alaska Packers Association.	
Alex B. Uhrig [1]	KFSA		PG	X	Reiss S. S. Co	Do.
Amazon [1]	KDXP		PG	X	Pioneer S. S. Co	Do.
A. M. Scott [3]	KFSF		P	X	Inland and Coastwise Waterways Service.	Do.
Australia [1]	KDXO		PG	X	Pioneer S. S. Co	Do.
Boston	WEL		PG		Eastern S. S. Lines	
Capt. John W. McKie [3]	KFPI		P	X	Inland and Coastwise Waterways Service.	Do.
Commissioner [4]	KOGZ	8	PG	X	Merritt-Chapman & Scott Corporation.	I. W. T. Co.
El Paso [5]	KFPE		PR	X	Booth Fisheries Co.	Owner of vessel
Fire Boat No. 31 [6]	KFPA		P	X	Boston Fire Department.	Do.
Fire Boat No. 44 [6]	KFPC		P	X	do	Do.
Fire Boat No. 47 [6]	KFPD		P	X	do	Do.

[1] Range, 200; system, Navy-Simon, 1000; w. l., 300, 600, 706; rates, Great Lakes service 2 cents per w
[3] Range, 200; system, Simon, 1000; w. l., 300, 600, 1100.
[4] Range, 150; system, Navy-R. C. A., 1000; w. l., 300, 600, 1100.
[5] Range, 150; system, Kilbourne & Clark, 1000; w. l., 300, 600.
[6] Range, 150; system, R. C. A., 1000; w. l., 300, 550, 600; communicates only with certain land sh

Commercial ship stations, alphabetically by names of vessels—Continued.

Name of vessel	Call signal	Rates	Service	Hours	Owner of vessel	Station controlled by—
Frank Billings [1]	KDXM		PG	X	Pioneer S. S. Co	Owner of vessel.
G. A. Tomlinson [1]	KDXJ		PG	X	do	Do.
Harold B. Nye [1]	KDXS		PG	X	do	Do.
James E. Ferris [1]	KDXK		PG	X	do	Do.
James P. Walsh [1]	KDXW		PG	X	do	Do.
J. J. Sullivan [1]	KDXV		PG	X	do	Do.
John S. Manuel [1]	KDXL		PG	X	do	Do.
John Stanton [1]	KDXT		PG	X	do	Do.
Joseph G. Butler, jr. [1]	KDXU		PG	X	do	Do.
Kadiak	KFSC		PG	X	Alaska Packers Association.	
Leyden [3]	KZAL		PG	N	Atlantic, Gulf & Pacific Co.	
Lieut. Col. Robert G. Gildart [2]	KFPK		P	X	Inland and Coastwise Waterways Service.	Do.
Martin Mullen [1]	KDXY		PG	X	Pioneer S. S. Co	Do.
New York	WJK		PG		Eastern S. S. Lines	
Price McKinney [1]	KDXR		PG	X	Pioneer S. S. Co	Do.
Priscilla	KFSE		PG	X	New York Shipbuilding Corporation.	
Progress	KFSD		PG	X	Pioneer S. S. Co	Do.
Star of Iceland	KFSB		PG	X	Alaska Packers Association.	
William A. Paine [1]	KDXZ		PG	X	Pioneer S. S. Co	Do.
William K. Field	KFOW		PG	X	Reiss S. S. Co	

[1] Range, 200; system, Navy-Simon, 1000; w. l., 300, 600, 700; rates, Great Lakes service 2 cents per word.
[2] Range, 150; system, Navy-R. C. A., 1000; w. l., 300, 600, 1100.
[3] Range, 200; system, Gray & Danielson, 240; w. l., 300, 600.

Commercial land and ship stations, alphabetically by call signals

[b=ship station; c=land station]

Call signal	Name		Call signal	Name	
KDXJ	G. A. Tomlinson	b	KFSD	Progress	b
KDXK	F. B. Hazard	b	KFSE	Priscilla	b
KDXL	E. L. Pierre	b	KFSF	A. M. Scott	b
KDXM	Frank Billings	b	KFVV	Alaska Packers Association vessels' general call	b
KDXO	Australia	b	KHI	Schumigan, Alaska	c
KDXP	Amazon	b	KHV	Uyak, Alaska	c
KDXQ	A. A. Augustus	b	KLD	Kenai, Alaska	c
KDXR	Price McKinney	b	KLN	Hilo, Hawaii	c
KDXS	Harold B. Nye	b	KMC	Kasaan, Alaska	c
KDXT	John Stanton	b	KOGZ	Commissioner	b
KDXU	Joseph G. Butler, jr	b	KOR	Quadra, Alaska	c
KDXV	J. J. Sullivan	b	KQI	Hunters Bay, Alaska	c
KDXW	James P. Walsh	b	KVQ	"Kvichak" (permanently moored scow)	c
KDXY	Martin Mullen	b	KYZ	Kenai, Alaska	c
KDXZ	William A. Paine	b	KZAL	Leyden	b
KFOW	William K. Field	b	WAV	Dearborn, Mich	c
KFPA	Fire Boat No. 31	b	WCV	Wyandotte, Mich	c
KFPC	Fire Boat No. 44	b	WEL	Boston	b
KFPD	Fire Boat No. 47	b	WKY	Boston, Mass	c
KFPE	El Paso	b	WJK	New York	b
KFPI	Capt. John W. McKie	b	WMB	Pottsville, Pa	c
KFPK	Lieut. Col. Robert G. Gildart	b	WNO	Alpena, Mich	c
KFSA	Alex. B. Uhrig	b			
KFSB	Star of Iceland	b			
[illegible]	[illegible]	b			

Broadcasting stations, alphabetically by names of cities

[Additions to the List of Radio Stations of the United States, edition of June 30, 1923]

City	Call signal	City	Call signal
Baltimore, Md	WCBM	Moberly, Mo	KFFP
Beloit, Kans	WPAR	Nashville, Tenn	WCBQ
Bemis, Tenn	WCBI	New York, N. Y	WSAP
David City, Nebr	KFOR	Omaha, Nebr	KFOX
Fort Benjamin Harrison, Ind	WCBN	Pittsburgh, Pa	WCBF
Fort Smith, Ark	KFOZ	Richmond, Calif	KFOU
Galveston, Tex	KFOQ	St. Paul, Minn	KFOY
Greenville, Tex	KFPM	St. Petersburg, Fla	WCBK
Houlton, Me	WCBL	Youngstown, Ohio	WDBF
Jennings, La	WCBJ	Salt Lake City, Utah	KFOO
Los Angeles, Calif	KFPG	Sioux City, Iowa	KFOV
Memphis, Tenn	WCBO	Wichita, Kans	KFOT

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

[Additions to the List of Radio Stations of the United States, edition of June 30, 1923]

Call signal	Location of station	Operated and controlled by—	Power (watts)	Wave length	Frequency (kilocycles)
KFFP	Moberly, Mo	First Baptist Church	50	286	1,130
KFOO	Salt Lake City, Utah	Latter Day Saints University.	10	261	1,150
KFOQ	Galveston, Tex., 3216 Ave. O	Ora W. Chancellor	50	240	1,250
KFOR	David City, Nebr	David City Tire & Electric Co.	10	226	1,330
KFOT	Wichita, Kans., First St. and Erie Ave.	College Hill Radio Club	50	231	1,300
KFOU	Richmond, Calif., 416 Twenty-third St.	Hommel Manufacturing Co.	100	254	1,180
KFOV	Sioux City, Iowa, 510, Pierce St.	Davis Electrical Corporation.	10	234	1,280
KFOX	Omaha, Nebr	Technical High School (Board of Education).	100	248	1,210
KFOY	St. Paul, Minn., 446 Jackson St	Beacon Radio Service	50	226	1,330
KFOZ	Fort Smith, Ark., 2208 Grand Ave.	Leon Hudson Real Estate Co.	20	233	1,290
KFPG	Los Angeles, Calif., 826 W. Seventh St.	Garretson & Dennis	100	238	1,260
KFPM	Greenville, Tex	New Furniture Co.	10	242	1,240
WCBF	Pittsburgh, Pa., 1133 Creedmore Ave.	Paul J. Miller	50	236	1,270
WCBI	Bemis, Tenn	Nicoll, Duncan & Rush	100	225	1,330
WCBJ	Jennings, La., 822 Main St	J. C. Maus	20	244	1,230
WCBK	St. Petersburg, Fla., 2961 Central Ave.	E. Richard Hall	500	256	1,170
WCBL	Houlton, Me	Northern Radio Manufacturing Co.	50	280	1,070
WCBM	Baltimore, Md., Charles St. and North Ave.	Charles Swarz	50	229	1,310
WCBN	Fort Benjamin Harrison, Ind	James P. Boland, lieutenant, U. S. A., 3d F. A.	50	266	1,130
WCBO	Memphis, Tenn., 189 Union Ave	Radio Shop (Inc.)	20	250	1,200
WCBQ	Nashville, Tenn	First Baptist Church	100	236	1,270
WDBF	Youngstown, Ohio, 234 W. Federal St.	Robert G. Phillips	50	245	1,220
WPAR	Beloit, Kans	Ward Battery & Radio Co.	10	236	1,270
WSAP	New York, N. Y	Seventh Day Adventist Church.	250	263	1,140

Government ship stations, alphabetically by names of stations

[Additions to the List of Radio Stations of the United States, edition of June 30, 1923, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Station	Call signal	Wave length	Service Hours		Station controlled by—
Albatross	NQY		O	N	Bureau of Fisheries.
Natoma	NUGG		O	X	Coast and Geodetic Survey.
Patrol	NIXY		O	X	Coast Guard Service.

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	
NAVD	Wilmette	b	NQY	Albatross	b
NIVX	Patrol	b	NUOG	Natoma	b
NOLF	S. C. 156	b			

Special land stations, alphabetically by names of stations

[Additions to the List of Radio Stations of the United States, edition of June 30, 1923]

Station	Call signal	Station controlled by—
Atlanta, Ga	4XS	Harry F. Dobbs, 427 Peachtree St.
Do	4XV	Theo. H. Abbey, 138 W. Baker St.
Do	4XW	Henry L. Reid, 76 E. Twelfth St.
Baltimore, Md	3XAQ	Harold Harvey, 2935 St. Paul St.
Beeville, Tex	5ZA1	Rialto Theater.
Cincinnati, Ohio	8XBV	Ainsworth Gates Radio Co.
Detroit, Mich	8ZN	Walter H. Volger, 117 Lafayette Boulevard.
Lenox, Mass	1XAS	Harris Fahnestock, Jr.
Miami, Fla	4XT	Daniel W. Smith, 130 SW. North River Drive.
Do	4ZC	Electrical Equipment Co., 42 Fourth St. NW.
Morgantown, W. Va	8XBW	University of West Virginia.
Oklahoma, Okla	5XAW	Francis M. Floyd, 315 Pioneer Building.
Omaha, Nebr	9YAV	Technical High School.
Palmetto, Ga	4XU	Berry W. Conkrgn, P. O. Box 113.
Portland, Oreg	7ZW	Arvid E. Herver, 321 E. Twenty-third St.
Providence, R. I. (portable)	1XAT	Shepard Co.
San Ysidro, Calif	6XBQ	Lester Picker.
Savannah, Ga	4XX	Paul G. Watson, 830 E. Park Ave.
Do	4ZD	Do.
Worcester, Mass	1ZP	Worcester Radio Association, 766 Main St.

Special land stations, grouped by districts

Call signal	District and station	Call signal	District and station
	First district:		Fifth district:
1XAS	Lenox, Mass.	5XAW	Oklahoma, Okla
1XAT	Providence, R. I. (portable).	5ZA1	Beeville, Tex.
1ZP	Worcester, Mass.	Sixth district: San Ysidro, Calif.	
3XAQ	Third district: Baltimore, Md.	6XBQ	
	Fourth district:	7ZW	Seventh district: Portland, Oreg.
4XS	Atlanta, Ga.		Eighth district:
4XT	Miami, Fla.	8XBV	Cincinnati, Ohio.
4XU	Palmetto, Ga.	8XBW	Morgantown, W. Va.
4XV	Atlanta, Ga.	8ZN	Detroit, Mich.
4XW	Do.	9YAV	Ninth district: Omaha, Nebr.
4XX	Savannah, Ga.		
4ZC	Miami, Fla.		
4ZD	Savannah, Ga.		

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, 1923, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

ALITAK, ALASKA.—Range, 150; w. l., 300, 500, *600*.
BIRMINGPORT, ALA.—Range, 500; system, Wireless Specialty Apparatus Co., 1000; w. l., 300, *600*, 1100, 1800.
CANDLE, ALASKA.—Hours, 9–10 a. m. and 7–8 p. m.
CAPE MAY, N. J.—W. l., 300, *600*, 706.
CHOMLY, ALASKA.—System, Wireless Specialty Apparatus Co., 1,000; w. l., add 450; hours, 8 a. m.–10 p. m.
CLARKS POINT, ALASKA.—W. l., 300, 400. *600*; service, FX.
EAST HAMPTON, N. Y.—Range, 150; w. l., 300, *600*, 625.
EGEGIK, ALASKA.—Range, 150; system, Navy-R. C. A., 1,000.
EKUK, ALASKA.—Range, 150; system, Navy-R. C. A., 1,000; w. l, 300, 550, *600*.
FORT MORGAN, ALA.—Range, 200; w. l., 300, *600*, 1713.
KAUNAKAKAI, HAWAII.—Range, 150.
KAWAIHAE, HAWAII.—Hours, 7.30 a. m.–5.30 p. m.
"KOGGIUNG" (KUBX).—Loc. (approximately) O. 157° 02′ 00″, N. 58° 50′ 00″.
KVICHAK, ALASKA.—W. l., 300, 400, *600*.
LOCKANOK, ALASKA.—Range, 150; system, Navy-R. C. A., 1000.
MANISTIQUE, MICH.—Service, PG & P; rates, ship service, 10 cents per word.
MEMPHIS, TENN.—Range, 500; system, Wireless Specialty Apparatus Co., 1000; w. l., 300, *600*, 1100.
MOBILE, ALA. (WPP).—Range, 200–500; system, Federal arc and composite spark, 1000; w. l., 300, *600*, 1100, 1200, 1800.
NEW LONDON, CONN. (WST).—W. l., 300, *600*, 625.
NEW ORLEANS, LA.—W. l., 300, *600*, 1713, 2850.
NUSHAGAK, ALASKA.—W. l., 300, 550, *600*, 1600.
PYBUS BAY, ALASKA.—System, Wireless Specialty Apparatus Co., 1000; w. l., add 450; hours, 8 a. m.–10 p. m.
QUADRA, ALASKA.—System, Wireless Specialty Apparatus Co., 1000; w. l., add 450; hours, 8 a. m.–10 p. m.
ROSE INLET, ALASKA.—System, Wireless Specialty Apparatus Co., 1000; w. l., add 450; hours, 8 a. m.–10 p. m.
SNAG POINT, ALASKA.—W. l., 300, 500, *600*.
TEE HARBOR, ALASKA.—System, Wireless Specialty Apparatus Co., 1000; w. l., add 450; hours, 8 a. m.–10 p. m.
WAHIAWA, HAWAII.—Range, 300; system, composite v. t. telegraph and composite spark, 360; w. l., 300, 550, *600*, 2350.
YES BAY, ALASKA.—System, Wireless Specialty Apparatus Co., 1000; w. l., add 450; hours, 8 a. m.–10 p. m.
Strike out all particulars of the following-named stations, Dearborn, Mich., Long Beach, Calif. (KUXT), Los Angeles, Calif. (portable, KPK), Metha Nelson, Pedrocitas, Calif., San Francisco, Calif. (KEB), San Francisco, Calif. (KUO), San Ysidro, Calif.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY BY NAME OF VESSELS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1923, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

ALDEN, ANDERSON.—System, Gray & Danielson, 240; w. l., 300, *600*, 706.
A. L. KENT.—W. l., 300, 450, *600*, 706.
AMERICAN MERCHANT.—Range, 300; system, Navy-R. C. A., 1000; w. l., 300, 450, *600*, 706.
AMERICAN TRADER.—Range, 300; system, Navy-R. C. A., 1000; w. l., 300, 450, *600*, 706; station operated and controlled by S. O. R. S.
ANN ARBOR, No 3.—Station operated and controlled by owner of vessel; rates, Great Lakes service, 6 cents per word.
ARAPAHOE (KFFM).—Name changed to Star of Falkland.
BAYTOWN.—W. l., add 706.
BETHORE.—W. l., 300, 450, *600*, 706.
BOSTON.—Station operated and controlled by R. C. A.

CARLTON.—System, Navy-R. C. A., 1000; w. l., add 706.
CARPLAKA.—W. l., add 706.
CHALLAMBA.—Range, 150.
CHALMETTE.—System, R. C. A., 1000; w. l., 300, *600*, 706; Munson S. S. Line, owner of vessel.
CHARLES L. HUTCHINSON.—Range, 200; system, Navy-Simon, 1000; w. l., add 706; station operated and controlled by owner of vessel.
CITY OF ALTON.—W. l., add 706.
CITY OF FAIRBURY.—System, Navy-Lowenstein, 1000; w. l., add 706.
CITY OF LOWELL.—W. l., 300, *600*, 706; hours, N.
CLEMENS A. REISS.—Range, 200; system, Navy-Simon, 1000; w. l., add 706; station operated and controlled by owner of vessel.
COALINGA.—Associated Oil Co., owner of vessel.
COMMISSIONER.—Range, 150; system, Kilbourne & Clark, 1000; w. l., 300, *600*; rates, 8 cents per word.
CORNELIA.—A. H. Bull S. S. Co., owner of vessel.
CORSAIR.—System, R. C. A., 1000; hours, N; rates, 8 cents per word.
CUBORE.—W. l., add 706.
DAVID C. MEYER.—Range, 200; system, Gray & Danielson, 240; w. l., 300, *600*, 706; station operated and controlled by owner of vessel; rates, 8 cents per word.
DEAN EMERY.—System, Navy-R. C. A., 1000; w. l., add 706.
DELISLE.—Porto Rico-American S. S. Co., owner of vessel.
DIRIGO.—W. l., add 706.
DIXIE ARROW.—W. l., 300, 450, *600*, 706.
DORCHESTER.—W. l., add 706.
DOROTHY ALEXANDER.—Range, 200; system, R. C. A. v. t. telephone and telegraph; w. l., 300, *600*, 706, 870, 1800, 2100, 2400–870 meters is used for limited commercial telephone service with the ship stations, Admiral Farragut, Matsonia, and H. F. Alexander.
DULCINO.—W. l., add 706.
EASTERN CROWN.—W. l., add 706; hours, N.
EASTERNER.—System, Navy-R. C. A., 1000.
EASTERN TEMPEST.—System, Navy-Kilbourne & Clark, 1000.
EL CAPITAN (WNB).—James M. Botts, owner of vessel.
ELDRIDGE.—System, Navy-Liberty, 1000; w. l., add 706.
EMERGENCY AID.—W. l., 300, 450, *600*, 1800, 2100, 2400.
EXCELSIOR.—Munson S. S. Line, owner of vessel.
FIRMORE.—System, R. C. A., 1000.
FEDERAL (KDWY).—W. l., add 706; station operated and controlled by R. C. A.
FEDERAL (WDOO).—System, Navy-R. C. A., 1000; w. l., add 706.
GAFFNEY.—W. l., add 706.
GENE CRAWLEY.—W. l., add 706.
GEORGE WASHINGTON.—System, Navy-R. C. A., 1000 and Federal arc; w. l., 300, 450, *600*, 706, 2100, 2400.
GLENDARUEL.—System, R. C. A., 1000; w. l., 300, *600*, 706; rates, 8 cents per word.
GOVERNOR COBB.—W. l., add 706.
GOVERNOR JOHN LIND.—Porto Rico-American S. S. Co., owner of vessel.
GULF QUEEN.—W. l., add 450.
HANLEY.—Hanley S. S. Co., owner of vessel.
H. H. ROGERS.—W. l., add 706.
HOMER.—Rates, North and South American service, 4 cents per word; transoceanic service, 8 cents per word.
HULVER.—W. l., add 706.
I. C. WHITE.—W. l., add 706.
INTREPID.—Range, 300; w. l., 300, 450, *600*, 706.
J. A. BOSTWICK.—W. l., add 706.
J. FLETCHER FARRELL.—W. l., add 706.
J. L. REISS.—Range, 200; system, Navy-Simon, 1000; w. l., add 706; station operated and controlled by owner of vessel.
KENOWIA.—System, Navy-Wireless Specialty Apparatus Co., 1000.
LAFCOMO.—W. l., add 706.
LIVINGSTONE ROE.—W. l., add 706.
MAINE.—Fairfield S. S. Corporation, owner of vessel.
MANHATTAN ISLAND.—W. l., add 706; station operated and controlled by S. O. R. S.
MANATAWNY.—Range, 300; system, Navy-R. C. A., 1000; w. l., 300, 450, *600*,

MANUKAI.—W. l., add 706; hours, X.
MAQUAN.—W. l., 300, 450, *600*, 706, 1800, 2100, 2400.
MIAMI.—W. l., 300, *600*, 706.
MOHEGAN.—W. l., 300, 450, *600*, 706; hours, N.
NARBO.—W. l., 300, 450, *600*, 706, 2100, 2400.
NARWHAL.—System, Navy-Wireless Specialty Apparatus Co., 1000, w. l., 300, 450, *600*, 706; rates, 8 cents per word.
NEW YORK.—Station operated and controlled by R. C. A.
NORMAN BRIDGE.—W. l., add 706.
OPHIS.—System, Navy-Lowenstein, 1000; w. l., add 450.
ORIZABA.—W. l., 300, 450, *600*, 706, 2100, 2400; rates, 8 cents per word.
OTTO M. REISS.—Range, 200; system, Navy-Simon, 1000; w. l., add 706; station operated and controlled by owner of vessel.
OWEGO.—James Kiefer, owner of vessel.
PALLAS.—System, Navy-R. C. A., 1000; w. l., 300, *600*, 706; station operated and controlled by S. O. R. S.
PENNSYLVANIA.—W. l., 300, 450, *600*, 706.
POLARINE.—W. l., add 706.
POMONA.—Pomona S. S. Co., owner of vessel.
PRESIDENT BUCHANAN.—Name changed to Republic.
PRESIDENT GARFIELD.—Dollar S. S. Line, owner of vessel.
PRESIDENT LINCOLN.—Station operated and controlled by S. O. R. S.
PRESIDENT MADISON.—W. l., 300, 450, *600*, 706, 2100, 2400.
PRESIDENT MONROE.—Dollar S. S. Line, owner of vessel.
PRESIDENT POLK.—Dollar S. S. Line, owner of vessel.
PROVIDENCE.—W. l., 300, 450, *600*, 706; hours, N.
RADNOR.—W. l., 300, 450, *600*, 706.
RAYO.—W. l., add 706.
RICHARD J. REISS.—Range, 200; system, Navy-Simon, 1000; w. l., add 706; station operated and controlled by owner of vessel.
SANTA BARBARA.—Range, 300; w. l., add 706.
SARAMACA.—System, Wireless Specialty Apparatus Co., 1000; w. l., add 706.
SCOTTSBURG.—W. l., 300, 450, *600*, 706.
SENATOR BAILEY.—W. l., add 706.
SKAGWAY.—Station operated and controlled by I. W. T. Co.
S. M. SPALDING.—W. l., add 706.
SOCONY 92.—W. l., 300, *600*, 706.
SUBOATCO.—Electric Boat Co., owner of vessel.
SUCARSECO.—Electric Boat Co., owner of vessel.
SUCUBACO.—Electric Boat Co., owner of vessel.
SUDFFCO.—Range, 300; system, Navy, 1000; w. l., 300, 450, *600*, 706.
SUEDCO.—Electric Boat Co., owner of vessel.
SUN.—W. l., 300, *600*, 706.
SUPHENCO.—Electric Boat Co., owner of vessel.
SUTRANSCO.—Electric Boat Co., owner of vessel.
SWIFT WIND.—System, I. W. T. Co., 1000; w. l., add 706.
VABA.—Range, 300; system, Navy-Liberty, 1000; w. l., 300, 450, *600*, 706.
VOLUNTEER.—W. l., add 706.
WEKIKA.—System, Navy-R. C. A., 1000.
WEST CORUM.—W. l., add 706.
WEST ERRAL.—System, Navy-Wireless Specialty Apparatus Co., 1000; w. l., add 706.
WEST GREYLOCK.—Name changed to Greylock, Greylock S. S. Corporation, owner of vessel.
WEST IRA.—W. l., add 706.
WEST JAFFREY.—System, Navy-R. C. A., 1000; w. l., add 706.
WEST KEATS.—W. l., 300, *600*, 706.
WEST KEDRON.—W. l., add 706.
WEST MODUS.—W. l., add 706.
WEST TOTANT.—W. l., add 706.
WALTER D. MUNSON.—W. l., 300, 450, *600*, 706; Munson S. S. Line, owner of vessel.
W. C. TEAGLE.—W. l., add 706.
W. H. MCGEAN.—Range, 200; system, Navy-Simon, 1000; w. l., add 706; station operated and controlled by owner of vessel.
WILLIAM A. REISS.—Range, 200; system, Navy-Simon, 1000; w. l., add 706;

WILLIAM GREEN.—W. l., add 706.
WINSTON-SALEM.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 450, *600*, 706.
W. M. IRISH.—System, R. C. A., 1000; w. l., 300, 450, *600*, 706.
YUMA.—Mexican-American Fruit & S. S. Corp., owner of vessel.
Strike out all particulars of the following-named vessels: Adria, Armenia, Ausable, Brynhilda, Callao, Columbia (WHC), Craftsman, Glyndon, Guarina, Liberator (KDTA), Logan, Matanzas, Muskegon, Nansemond, San Antonio, Santiago, S. M. Fischer, Washtenaw, Winding Gulf.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS

KDTV, *read* Greylock; KFFM, *read* Star of Falkland; KSN, *read* Republic; strike out all particulars of the following call signals: KDEN, KDGP, KDTA, KDZS, KEB, KEZQ, KFDE, KFN, KIBR, KIO, KMP, KOMN, KPK, KUO, KUSZ, KUXT, KUXV, KWE, KYM, WFEE, WFEU, WHC, WHF, WPH, WPOO, WQR, WWP.

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, 1923, and list in March edition of Bulletin]

KFBE (San Luis Obispo, Calif.).—Power, 50.
KFBL (Everett, Wash.).—Power, 15.
KFCP (Ogden, Utah).—Power, 10.
KFEV (Casper, Wyo.).—Power, 50.
KFGL (Arlington, Oreg.).—Station operated and controlled by Snell & Irby; power, 10.
KFIL (Louisburg, Kans.).—Power, 50.
KFPB (Seattle, Wash.).—Power, 15.
KJQ (Stockton, Calif.).—W. l., 273, frequency, kc. 1100.
KMJ (Fresno, Calif.).—W. l., 248, frequency, kc. 1210.
KQV (Pittsburgh, Pa.).—W. l., 273, frequency, kc. 1110; power, 500.
KTW (Seattle, Wash.).—Power, 500.
KWG (Stockton, Calif.).—Power, 50.
KWH (Los Angeles, Calif.).—Power, 250.
KZM (Oakland, Calif.).—Power, 100.
KZN (Salt Lake City, Utah).—Station operated and controlled by Cape & Johnson; w. l., 268, frequency, kc. 1120.
WAAW (Omaha, Nebr.).—Power, 500.
WBBY (Charleston, S. C.).—Power, 10.
WBS (Newark, N. J.).—Power, 50.
WCAT (Rapid City, S. Dak.).—Power, 50.
WCBG (Pascagoula, Miss.—portable).—W. l., 236, frequency, kc. 1270.
WDAS (Worcester, Mass.).—Power, 10.
WFAJ (Asheville, N. C.).—Power, 100.
WFAM (St. Cloud, Minn.).—Power, 10; w. l., 273, frequency, kc. 1100.
WGI (Medford Hillside, Mass.).—Power, 100.
WGR (Buffalo, N. Y.).—Power, 750.
WJAZ (Chicago, Ill.).—Call signal changed to WGN.
WHAR (Atlantic City, N. J.).—Station operated and controlled by Seaside House.
WKAP (Cranston, R. I.).—Power, 50.
WLAK (Bellows Falls, Vt.).—Power, 500.
WLAP (Louisville, Ky.).—Power, 20.
WMAP (Easton, Pa.).—Power, 50.
WOAH (Charleston, S. C.).—Power, 10.
WOAN (Lawrenceburg, Tenn.).—Power, 200.
WOAT (Wilmington, Del.).—Power, 100.
WOI (Ames, Iowa).—Power, 500.
WPAU (Moorhead, Minn.).—Power, 10.
WQAC (Amarillo, Tex.).—W. l., 234, frequency, kc. 1280.
WSAG (St. Petersburg, Fla.).—Station operated and controlled by Loren V. Davis.
WSAR (Fall River, Mass.).—Power, 100.

Strike out all particulars of the following-named stations: KFDL (Denver, Colo.), KXD (Modesto, Calif.), WABK (Worcester, Mass.), WEAS (Washington, D. C.), WIAR, (Paducah, Ky.), WJH (Washington, D. C.), WKAY (Gainesville, Ga.), WPAH (Waupaca, Wis.), WQAV (Greenville, S. C.), WRAD (Marion, Kans.), WSAH (Chicago, Ill), WSAL (Brookville, Ind.).

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, 1923, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

ANACOSTIA, D. C. (R. C.).—Call signal changed to NBM.
CIRCLE, ALASKA.—System, R. C. A. arc; w. l., add 4000.
CRAIG, ALASKA.—Range, 100; system, Army v.t. telephone and telegraph.
DULUTH RANGE REAR LIGHT STATION, MINN.—System, composite v. t. telephone.
FORT GIBBON, ALASKA.—System, Army v. t. telephone and telegraph.
FORT YUKON, ALASKA.—Range, 100; system, Army v. t. telephone and telegraph.
HOLY CROSS, ALASKA.—System, Army v. t. telephone and telegraph.
IDITAROD, ALASKA.—Range, 100–300; system, U. S. Army v. t. telephone and telegraph, and Federal arc; w. l., add 3500.
LIVENGOOD, ALASKA.—Range, 100; system, Army v. t. telephone and telegraph.
MARQUETTE LIGHT STATION, MICH.—System, composite, v. t. telephone; w. l., 143.
NOME, ALASKA.—System, U. S. Navy arc, Federal arc, and Army v. t. telephone and telegraph.
NULATO, ALASKA.—W. l., 650, 660, 730, 760.
STANNARD ROCK LIGHT STATION, MICH.—System, composite v. t. telephone and telegraph; w. l., 143.
SUPERIOR ENTRY LIGHT STATION, WIS.—System, composite v. t. telephone.
TACOTNA, ALASKA.—Range, 100; system, Army v. t. telephone and telegraph; w. l., *600*.

GOVERNMENT 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, 1923, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

KEARSARGE.—Name changed to Crane Ship No. 1.
S. P. 179 (Privateer).—Name changed to Privateer.
S. P. 181 (Helori).—Name changed to Helori.
S. P. 185 (Clarinda).—Name changed to Clarinda.
S. P. 1116 (Genesee).—Name changed to Genesee.
S. P. 1149 (Barnett).—Name changed to Barnett.
S. P. 1161 (Choptank).—Name changed to Choptank.
S. P. 2047 (Moosehead).—Name changed to Moosehead.
S. P. 2225 (Navigator).—Name changed to Navigator.
Strike out all particulars of the following-named vessels: Chauncey, Connecticut, Constellation, Constitution, Delphy, Fuller, Harbor Tug No. 61, Indiana, Intrepid, Iowa, Kansas, Kentucky, Louisiana, Massachusetts, Mexican, Michigan, Minnesota, Montana, Nansemond, New Hampshire, Nicholas, North Carolina, Ohio, Roanoke, S. C. 23, S. C. 340, South Carolina, South Dakota, S. P. Lee, Tacoma, United States, Vermont, Washington, Woodbury, Yacona, Young.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS

NAQM, *read* Moosehead; NBM, *read* Anacostia, D. C. (R. C.); NECD, *read* Navigator; NEFS, *read* Helori; NIP, *read* Crane Ship No. 1; NKG, *read* Genesee; NTD, *read* Choptank; NUDF, *read* Privateer; NUFN, *read* Barnett; NUFZ, *read* Clarinda; strike out all particulars of the following call signals, NAMC, NATM, NDQ, NEBF, NEDF, NESB, NESG, NEZQ, NFY, NHU, NIFF, NIFG, NIO, NIQ, NIRP, NIRQ, NIRS, NISG, NISJ, NISK, NITL, NJB, NJM, NJZ, NKD, NME, NMW, NOBQ, NOXF, NSW, NUA, NUMX, NUNQ, NUNZ, NVK, NWE.

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, 1923]

MONTEREY, CALIF. (6ZBC).—Address, 2417 Gladys Avenue.
PHILADELPHIA, PA. (3XB).—Station operated and controlled by W. C. Eglin, 1000 Chestnut Street.
Strike out all particulars of the following-named stations, Ashland, Ohio (8ZN), Blackburg, Va. (3XN), Marietta, Ohio (8YAA), Morgantown, W. Va. (8YE), Pittsburgh, Pa. (8YAI), San Francisco, Calif. (6XB), Sioux City, Iowa (9ZU), Valley Stream, N. Y. (2XAQ).

MISCELLANEOUS

U. S. S. "SCORPION" HANDLING TRAFFIC IN TURKISH WATERS

Referring to the notice published in the April, 1923, edition of this publication the bureau has now been advised that the U. S. S. *Scorpion*, stationed in Turkish waters, is equipped with only a 300-watt tube set. This vessel is no longer stationed permanently at Constantinople and may be at Pireaus, Smyrna, Constanza, or other places in the eastern Mediterranean. She is usually at a place with cable or telegraph connection, but it should be understood that conditions are constantly changing and this information may not be of value at any time hence. The call letters of the station are NTT and the general call for United States naval vessels in Turkish waters is NTTX. Both United States naval vessels and United States Shipping Board vessels in Turkish waters will relay messages for American ships when they are in a position to do so.

BROADCASTING IN SWITZERLAND

Radiotelephony as a national pastime, such as it has become in the United States and England, appears to have no great future in Switzerland. It was originally intended to erect a central national broadcasting station, but this idea has been abandoned, and a system of decentralized stations is now proposed. In view of the fact that there are only about 4,000,000 people in Switzerland, it is quite obvious that broadcasting must be kept within modest bounds.

It is reported that arrangements are being made for the erection within the near future of four broadcasting stations. They will be located, respectively, at Lausanne, Geneva, Zurich, and Basel. Plans are now being prepared for the station at Basel, and the installation work will begin at an early date. The work of constructing the station at Zurich has been temporarily retarded pending certain financial adjustments, but the promoters hope to be able to complete the undertaking without much further delay.

The chief difficulty to be encountered is the expense of providing programs. The Swiss Federal Government is giving its encouragement and assistance to the undertaking, and has decided to place at the disposal of the four stations the larger part of the revenue derived from the licenses issued to amateurs. Industrial circles, amateurs, public corporations, and other interested bodies are being urged to subscribe to the scheme.

BROADCASTING IN MEXICO

About 100 sets are in use in Tampico at present. Two small broadcasting stations are being operated in Tampico by local companies. Operation of radio sets up to 20 watts capacity are permitted throughout the Republic of Mexico for a fee of $2.50 per year.

RADIO IN TURKEY

Demand for radio apparatus in Turkey is awaiting the commencement of broadcasting, which has not yet been established on a commercial basis. A concession for the purpose of operating a low-power broadcasting station at Constantinople has been applied for by German radio manufacturers.

AUSTRIAN BROADCASTING COMPANY TO BE FORMED

Formation of a company called "Broadcasting A. G." is being undertaken by the Government to carry on radiotelephone broadcasting in that country. Applications for radio concessions from the German Telefunken Gesellschaft, the E. Schrack Radio Werke, and other companies had been pending, but it was decided not to grant a monopoly to any privately owned concern. A majority of the shares of stock of the new company will be held by the Austrian State.

OPERATION OF RADIO IN GREECE TO BE PERMITTED

Some months ago the revolutionary Government forbade, by legal decree, the operating of private wireless apparatus in Greece. However, the Ministers of Finance and Marine of the present Government, according to unofficial advices, have now prepared a bill to be submitted to the National Assembly for ratification, by which the operation of private radio sets belonging to Greek individuals will be permitted under certain restrictions and subject to the payment of a license tax.

MELBOURNE INAUGURATES BROADCASTING SERVICE

Successful broadcasting tests were made at Melbourne on January 25, 1924, by the Amalgamated Wireless (Ltd.). Music was distinctly heard at King and Flinders Islands and even at Hobart, Tasmania. The power used for transmission was a quarter kilowatt. It is reported that a permanent station will soon be erected, probably at Footscray, near Melbourne, with a wave length of 1,720 meters.

HEROIC WORK OF RADIO OPERATORS

The United States Shipping Board has called the bureau's attention to the unusual services performed by radio operators, Howard A. Moyer, Charles R. Stewart, and Alexander D. MacAlpin, aboard the *President Monroe* when the vessel encountered heavy weather in the North Atlantic during January.

These operators jeopardized their lives in assisting in erecting the ship's antenna, which had washed overboard, notwithstanding the fact that the officers of the ship refused to allow the members of the deck force to assist the operators in this hazardous work. Their faithfulness to their duty, however, inspired them to erect the needed antenna and thereby maintain the radio installation in operating condition for an emergency.

CHANGE IN RATES FOR MARCONI CANADIAN LAND STATIONS

Effective March 1 next, the coast and ship rates applicable to radiotelegrams via Great Lakes stations will be 6 cents per word for coast rate and 4 cents per word for ship rate. The stations affected are Toronto, Kingston, Port Burwell, Midland, Point Edward, Sault Ste. Marie, Port Arthur, and Tobermory.

GUANTANAMO NAVAL STATION TO TRANSMIT WEATHER REPORTS

The Guantanamo station, call letters NAW, has been authorized to rebroadcast the San Juan weather reports at 2,100, seventy-fifth meridian time, daily between June 1 and November 1. The transmission will be on 4,543 meters, arc.

WEATHER REPORTS NO LONGER TRANSMITTED BY GREAT LAKES STATION

The Weather Bureau advises that the broadcasting of weather bulletins from the United States naval station at Great Lakes, Ill., call letters NAJ, were discontinued March 1 last.

CHANGE IN METHOD OF TRANSMITTING TIME SIGNALS FROM NAUEN

The bureau has been informed that the station at Nauen, Germany, now transmits time signals on a wave length of 18,000 meters in place of 13,000 meters. The sending time is not changed, but is as formerly, 1200 G. M. T. and 2400

BROADCASTING IN JAPAN

A bill has been introduced by the Japanese Government regulating broadcasting, transmitting, and receiving stations. The bill limits the power used and provides for certain low wave lengths. The license fee is also charged. There are many conditions which must be met before a license may be issued.

IMPORTANT INFORMATION FROM THE BERNE BUREAU

Belgium.—The coast station at Ostend sends, if necessary, at 0900, 1800, and 2200, urgent information concerning safe navigation, such as the extinction of buoy lights or beacon lights, buoys or beacon ships adrift, floating mines, wrecks dangerous to navigation, etc. The service of the coast station Westhinder lightship is provisionally limited to the transmission of official radiograms, to the transmission of Ostend-Aerodrome meteorological information, and to messages emanating from captains of ships provided with wireless, or destined to them, relating to accidents and difficulties of navigation. These communications are gratuitous. This station is open from 0400 to 0420 and during the first 20 minutes of each hour from 0800 to 2000 G. M. T.

France.—The coast station Mengam is open the following hours: 0000–0045, 0230–0700, 0830–1000, 1030–13, 1430–1800, 1930–2130, 2200–2400 G. M. T. However, because of its military service and its transmission of meteorological information, this station can not reply immediately to calls which are addressed to it for the exchange of private radiograms.

Madagascar.—The coast station Diego-Suarez is permanently open.

Russia.—The steamer *Ermak*, anchored at home in the port of Petrograd, has been replaced, provisionally, by the steamer *Sviatogar*, call letters RDB. Petrograd has been changed to the name of Leningrad.

CHANGE IN TRANSMISSIONS OF OXFORD, ENGLAND, STATION

Beginning March 1 last, messages broadcast from the Oxford station, call letters GBL, at 0100 G. M. T., are transmitted on 12,350 meters in place of 8,750 meters, as heretofore.

LIST OF VESSELS ON GREAT LAKES EQUIPPED WITH VACUUM TUBE RECEIVERS

The vessels named below, the radio stations of which are operated by the Radio Corporation of America, have been equipped with vacuum tube receivers:

A. D. McBeth.
Alabama (WFB).
Arizona.
Ashtabula.
B. H. Taylor.
Carl D. Bradley.
Carolina.
Charles O. Jenkins.
Christopher Columbus.
City of Benton Harbor.
City of Buffalo.
City of Cleveland III.
City of Detroit III.
City of Erie.
City of Grand Rapids.
City of Holland.
City of St. Joseph (KFIT).
City of Saugatuck.
Delphine.
Eastern States.
Favorite (KIFG).
Fayette Brown.
F. B. Squire.
Harry W. Croft.
Illinois (WCZ).
Indiana.
Iroquois (KUTQ).
James MacNaughton.
John A. Kling.
Juniata (WCB).
Lakeland.
M. A. Bradley.
Maitland No. 1.
Manitou.
Missouri.
North American.
Octorara.
Pere Marquette No. 8.
Petoskey.
Pilgrim.
Puritan.
Seandbee.
Sir Thomas Shaughnessy.
South American.
State of Ohio.
Stellaris.
The Harvester.
Tionesta.
Western States.
Westland (KDOY).
Wm. G. Mather.

WEATHER AND HYDROGRAPHIC REPORTS TRANSMITTED BY GREAT LAKES COAST STATIONS

Commencing with the opening of navigation, about April 1, the station WTK, Cleveland, Ohio, will broadcast weather and hydrographic information on a wave length of 706 meters, spark, at 10.45 a. m. and 4.45 p. m. (seventy-fifth meridian time).

In order to insure the receipt of the above broadcasts by vessels in Georgian Bay and the upper part of Lake Huron, arrangements have been completed to have the station WHT, Rogers, Mich., repeat the broadcasts of the Cleveland station on 706 meters, spark, at 11.15 a. m. and 5.15 p. m. (seventy-fifth meridian time).

No charge will be made for the transmission of any messages addressed to any branch hydrographic office and sent by a vessel equipped with apparatus of

ICE PATROL IN GULF OF ST. LAWRENCE

An ice patrol will be maintained in the Gulf of St. Lawrence, between Cape Ray and Heath Point, from the opening of navigation in the spring until the route is clear of ice. The ice breaker *Mikula*, radio call letters VDD, has been detailed for this service.

A regular message embodying ice conditions from Cape Race to Quebec, and recommendations as to route to be followed, will be made up by the ice patrol every four hours, commencing as from midnight eastern standard time (seventy-fifth meridian), and kept on file for immediate transmission by radio to ships upon request.

This information will also be broadcast twice daily by the ice-patrol vessel (VDD), at 8 a. m. and 8 p. m., eastern standard time, on *600* meters spark.

The coast radio stations at Cape Race (VCE), North Sydney (VCO), and Grindstone (VCN), will copy this message and will be prepared to pass the same to ships requesting it. Cape Race will also include the message in its regular ice broadcast at 9.15 a. m. and 9.15 p. m., eastern standard time, daily.

Ships requiring the latest information on the Gulf route should communicate directly with the ice-patrol vessel (VDD) on *600* meters.

The work of the patrol will be greatly facilitated if incoming ships will cooperate in supplying information regarding ice in their vicinity.

NOTE.—Vessels requiring information regarding ice conditions in the North Atlantic land routes should communicate with the International Ice Patrol vessel (NIDK), on 600 meters. The method of transmitting reports of this patrol is given in the February edition of this publication. It is requested that masters and others concerned instruct their radio operators to desist, as far as practicable, from operating during the time that the ice reports are being broadcast.

ALASKAN STATIONS REOPENED

The following-named stations in Alaska reopened for the 1924 season on the dates set after their names: Chomly (KDP), March 23; False Pass (KJL), March 12; Hawk Inlet (KKAI), March 22; Ikatan (KXW), March 14; Katalla (KSC), March 24; King Cove (KJK), March 13; Port Moller (KWR), March 23; Rose Inlet (KJC), March 23.

BRITISH WIRELESS ACT

Vessels of the United States on arriving at ports of the United Kingdom are subject to the provisions of the British wireless act of 1919, so far as applicable. An operator holding a cargo grade license issued by this Government is qualified to be a watcher as specified in the regulations.

Following is the act and regulations thereunder:

1. (1) Every seagoing British ship registered in the United Kingdom being a passenger steamer or a ship of 1,600 tons gross tonnage or upwards shall be provided with a wireless-telegraph installation, and shall maintain a wireless-telegraph service which shall be at least sufficient to comply with the rules made for the purpose under this act, and shall be provided with one or more certified operators and watchers, at least in accordance with those rules: *Provided*, That the Board of Trade may exempt from the obligations imposed by this act any ships or classes of ships if they are of opinion that, having regard to the nature of the voyages on which the ships are engaged, or other circumstances of the case, the provisions of a wireless-telegraph apparatus is unnecessary or unreasonable.

(2) The Board of Trade, in consultation with the Postmaster General, shall make rules prescribing the nature of the wireless-telegraph installation to be provided, of the services to be maintained, and the number, grade, and qualifications of operators and watchers to be carried: *Provided*, That no ship shall be required to carry more than one operator unless more than one operator would have been required under the provisions of the merchant shipping (convention) act, 1914.

(3) If this section is not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offense to a fine not exceeding £500, and any such offense may be prosecuted summarily, but if the offense is prosecuted summarily, the fine shall not exceed £100.

(4) A surveyor of ships or a wireless-telegraphy inspector may inspect any ship for the purpose of seeing that she is properly provided with a wireless-telegraph installation and certified operators and watchers in conformity with this act, and for the purpose of that inspection shall have all the powers of a Board of Trade inspector under the merchant shipping acts, 1894-1916.

If the said surveyor or inspector finds that the ship is not so provided, he shall give the master or owner notice in writing pointing out the deficiency, and also pointing out what, in his opinion, is requisite to remedy the same.

Every notice so given shall be communicated in the manner directed by the Board of Trade to the chief officers of customs of any port at which the ship may seek to obtain a clearance or transire, and the ship shall be detained until a certificate under the hand of any such surveyor or inspector is produced to the effect that the ship is properly provided with wireless-telegraph installation and certified operators and watchers in conformity with this act.

(5) The obligations imposed by this act shall not come into operation while the obligation with respect to wireless telegraphy on ships imposed by the Defense of the Realm Regulations remain in force, but shall be in addition to, and not in substitution for, the obligations as to wireless telegraphy imposed by

2. The foregoing provisions of this act shall, as from a date three months after the coming into operation of the obligations imposed by this act on British ships registered in the United Kingdom, apply to ships other than British ships registered in the United Kingdom while they are within any port in the United Kingdom in like manner as they apply to British ships so registered.

3. (1) This act may be cited as the merchant shipping (wireless-telegraphy) act, 1919, and the merchant shipping acts, 1894–1916, and this act may be cited together as the merchant shipping acts, 1894–1919.

(2) This act shall be construed as one with the merchant shipping act, 1894, and "passenger steamer" shall mean a steamer which carries more than 12 passengers, and "wireless-telegraphy inspector" means an officer appointed under section 20 of the merchant shipping (convention) act, 1914, for the purposes therein mentioned.

BRITISH RADIO REGULATIONS

The following regulations apply to all seagoing passenger steamers or ships of 1,600 tons gross tonnage or upwards, while within any port of the United Kingdom:

INTERPRETATION

1. In these rules the expression "coasting trade" means trade exclusively carried on between ports in the British islands. The number of hours occupied in a voyage from port to port means the normal number of hours occupied in a voyage between one port of call and the next.

CLASSIFICATION OF SHIPS

2. For the purposes of these rules ships shall be classified as follows:

Class I.—Ships carrying 200 persons or more which are not engaged in the coasting trade.

Class II.—Ships not engaged in the coasting trade carrying 50 but less than 200 persons and ships engaged in the coasting trade carrying 50 persons or more.

Class III.—Ships carrying less than 50 persons.

In reckoning the number of persons carried by a ship there shall be included the normal crew of the ship and the maximum number of passengers permitted to be carried by the passenger certificate of the ship.

NATURE OF INSTALLATION

3. The installation shall comply with the requirements of the International Radiotelegraph Convention, 1912, as modified by any other international agreement (and in particular the International Convention of Safety of Life at Sea, 1914), or of any international agreement by which the said convention of 1912 may be superseded.

4. The installation shall be of the spark or interrupted continuous-wave type.

5. (1) The installation shall include a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this rule as to emergency installations as well as those as to normal installations a normal installation alone shall suffice.

(2) A normal installation must be capable of transmitting clearly perceptible signals from ship to ship over a range of at least 100 nautical miles by day under normal condition and circumstances.

(3) An emergency installation must include an independent source of energy capable of being put into operation rapidly and working for at least six continuous hours with a minimum range from ship to ship of 80 nautical miles for ships of class I, and 50 nautical miles for ships of classes II and III, and such independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power for the ship, the steam supply system and the main electricity supply system.

(4) The purposes of this rule and installation shall be deemed to comply with the above requirements as to range if it is able to maintain communication on a 600-meter wave at a range of one and a half times the number of nautical miles hereinbefore respectively prescribed over sea by day with a post office standard station when employing a receiver without amplification devices.

6. There shall be provided between the bridge and the wireless-telegraph room means of communication by voice pipe, telephone, or other means, and an operator or watcher when on duty shall not leave the wireless-telegraph room to deliver messages or to call his relief.

SHIPS NOT FITTED WITH APPROVED AUTOMATIC APPARATUS

7. If not fitted with an approved automatic apparatus for registering the signal of distress—

(i) A ship of class I shall carry certificated operators in accordance with the following table, and while at sea a certificated operator shall be always on watch:

NATURE OF VOYAGE	NUMBER AND GRADE OF OPERATORS
(a) Voyage exceeding 48 hours from port to port.	Three operators, of whom one shall hold a first-grade certificate, and not more than one a third-grade certificate.
(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port.	Two operators, of whom one shall hold a first or a second grade certificate.
(c) Voyage not exceeding 8 hours from port to port.	One operator, who shall hold a first or a second grade certificate.

(ii) A ship of class II shall carry certificated operators and certificated watchers in accordance with the following table, and while at sea a certificated operator shall always be on watch at the times specified in the schedule to these rules, and either a certificated operator or a certificated watcher shall always be on watch at other times.

NATURE OF VOYAGE	NUMBER AND GRADE OF OPERATORS AND WATCHERS
(a) Voyage exceeding 48 hours from port to port.	One operator, who shall hold a first or a second grade certificate, and two watchers.
(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port.	One operator, who shall hold a first or a second grade certificate, and one watcher.
(c) Voyage not exceeding 8 hours from port to port.	One operator, who shall hold a first or a second grade certificate.

(iii) A ship of class III shall carry one operator, who shall hold a first or a second grade certificate, and

SHIPS FITTED WITH APPROVED AUTOMATIC APPARATUS

8. In the event of an automatic apparatus for registering the signal of distress being approved by the Board of Trade and the Postmaster General, a ship of class III shall be fitted with such apparatus unless the duration of the voyage on which it is employed does not exceed eight hours from port to port, but in such a case the operator shall be on watch during the whole time of the voyage.

9. If fitted with automatic apparatus for registering the signal of distress approved as aforesaid:

(i) A ship of class I shall carry certificated operators in accordance with the following table and while at sea a certificated operator shall always be on watch during the times specified in the schedule to these rules, and a watch shall be maintained at all other times either by a certificated operator or by a watcher or by means of the approved automatic apparatus:

NATURE OF VOYAGE	NUMBER AND GRADE OF OPERATORS
(a) Voyage exceeding 48 hours from port to port.	Two operators, one of whom shall hold a first-grade certificate.
(b) Voyage not exceeding 48 hours from port to port.	One operator, who shall hold a first or a second grade certificate.

(ii) A ship of class II shall carry one operator, who shall hold a first or a second grade certificate, and while at sea the operator shall be on watch during the times specified in the schedule to these rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

(iii) A ship of class III shall carry one operator, who shall hold a first or a second grade certificate, and while at sea the operator shall be on watch during the times specified in the schedule to these rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus: *Provided*, That if a ship of class III is fitted with an automatic apparatus for registering the signal of distress and with an automatic apparatus for registering the ship's own distinguishing signal, both of which have been approved by the Board of Trade and the Postmaster General, the operator shall not, while the ship is more than 150 nautical miles from any coast station, be required to be on watch at the times specified in the schedule to these rules.

QUALIFICATIONS OF OPERATORS

10. (1) Operators shall be graded into three grades in accordance with rules to be made by the Postmaster General with the concurrence of the Board of Trade, and watchers shall be certificated by the Postmaster General.

(2) Until graded in accordance with such rules as aforesaid:

(i) An operator who holds the Postmaster General's first-class certificate of proficiency and who has had three years' experience as an operator may be employed as if he held a first-grade certificate, but if an operator holding a first-grade certificate is available an operator holding a first-class certificate shall not be so employed on a ship of class I which is required by these rules to carry three operators.

(ii) An operator who holds the Postmaster General's first or second Class certificate of proficiency and who has had one year's experience as an operator may be employed as if he held a second-grade certificate.

(iii) An operator who holds the Postmaster General's first or second class certificate of proficiency and who has had less than one year's experience as an operator may be employed as if he held a third-grade certificate.

11. The Postmaster General may accept certificates granted to operators by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the regulations annexed to any International Radiotelegraph Convention for the time being in force.

12. These rules shall come into operation on the 1st day of September, 1920.

IMPROVEMENTS IN WAVE METERS

The increasing uses of radio and the assignment of transmitting stations to frequencies closely spaced has compelled earnest attention to the design and functioning of wave meters. The Bureau of Standards has found it necessary to develop methods of increasing the precision of setting and the reliability of its frequency measuring instruments. Whereas formerly an accuracy of 1 per cent was the limit of practical requirements and in excess of the frequency regulation of transmitting stations, an accuracy of 0.01 per cent is now sought. Attention has been given to the design of the various elements of a wave meter resulting in improvements which have produced condensers and coils whose constancy can be more fully relied upon. Various methods have been devised for improving the sensitiveness of indication of wave meters. These include verniers, slow-motion devices, and the use of a special scale on a dial connected by a reducing gear to the condenser shaft. The latter device can be applied with particular ease and satisfaction to wave meters of the direct reading decremeter type, the special scale being mounted in place of the decrement scale on such instruments. Several types of highly sensitive indicating instruments and methods have been devised. Another improvement is a wave meter so designed as to give uniform spacing of the scale graduations in kilocycles. On such a scale the class B broadcasting stations, for example, would tune in at uniform distances apart. The developments here outlined have been made during the past year. Publications describing them are in preparation and will be announced

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 most of the broadcasting stations listed use frequency indicators (one-point wave meters) and maintain a maximum deflection of the instrument on 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 wave meters and other apparatus by the procedure given in Bureau of Standards Letter Circular No. 92, Radio Signals of Standard Frequencies and Their Utilization. A copy of this letter circular can be obtained by a person having actual use for it upon application to the Bureau of Standards, Washington, D. C. In previous months similar data have been given for high-power low-frequency stations. They are not included in this month's list because no measurements were made upon them since the period covered in the list published last month.

Station	Owner	Location	Assigned frequency (kilocycles)	Period covered by measurements (1923–24)	Number of times measured	Greatest deviation from assigned frequency since Feb. 15, 1924	Average deviation from assigned frequency
						Per cent	*Per cent*
WWJ	Detroit News	Detroit, Mich.	580	Aug. 27–Mar. 15	30	0.1	0.1
WCAP	Chesapeake & Potomac Telephone Co.	Washington, D. C.	640	Sept. 11–Mar. 15	42	.3	.1
WRC	Radio Corporation of America.	do	640	Dec. 16–Mar. 15	17	.2	.1
WSB	Atlanta Journal	Atlanta, Ga.	700	Sept. 14–Mar. 15	44	.1	.1
WGY	General Electric Co.	Schenectady, N.Y.	760	June 26–Mar. 15	72	.1	.2
KDKA	Westinghouse Electric & Manufacturing Co.	East Pittsburgh, Pa.	920	Sept. 8–Mar. 15	87	.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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