

DEPARTMENT OF COMMERCE
BUREAU OF NAVIGATION

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION

Washington, May 1, 1924—No. 85

CONTENTS

	Page		Page
Abbreviations.....	1	Miscellaneous—Continued.....	
New stations.....	2	List of vessels equipped with Kolster radio compass.....	11
Alterations and corrections.....	5	Malin Head station weather bulletins.....	12
Miscellaneous:		Secretary of messages.....	13
Canadian broadcasting stations.....	9	Radio compass station directions for German stations.....	13
Radio beacon established at Nova Scotia.....	9	Radio instruments and measurements.....	14
Mexican broadcasting stations.....	10	Standard frequency stations.....	16
New service at Land's End station.....	10	Announcement of standard radio frequency transmissions.....	15
Ship schedule for Philippine coast stations.....	10	References to current radio periodical literature.....	15
Information from the Bernese bureau.....	10		
Navigational warnings by radio from British stations.....	11		

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.
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, 1923, and to the International List of Radiotelegraph Stations published by the Berns Bureau]

Station	Call signal	Wave lengths	Service	Hours	Station controlled by—
Aparri, P. I. ¹	KZAD..	550, 600, 1100, variable.	PG		Philippine Insular Government.
Dillard, Okla. ²	KZR..	1575, 1590	FX	X	Skelly Oil Co.
Greensburg, Pa. ³	WJL..	1590	FX	X	Pennsylvania State Police.
Honolulu, Hawaii ⁴	KYB..	238	FX	X	Hawaiian Pineapple Co.
Kaunapalapa, Hawaii ⁵	KRQ..	238	FX	X	Do.
Legaspi, P. I. ⁶	KZAJ..	550, 600, 250, variable.	PG		Philippine Insular Government.
Pillar Bay, Alaska ⁷	KYV..	300, 500, 600	FX	X	Didalgo Island Packing Co.
San Vincente, P. I. ⁸	KZAG..	550-1100, 750	PG		Philippine Insular Government.
Siginaka Island, Alaska ⁹	KXD..	300, 550, 600	FX	X	W. M. Cook.
Virac, P. I. ¹⁰	KZAH..	600, 750, 750	PG		Philippine Insular Government.

¹ Loc. O. 121° 38' 05" E., N. 18° 21' 30"; range, 100; system, U. S. Navy v. t. telegraph; hours, 8 a. m.-12 noon, 2-5.30 p. m. daily; 9-11 a. m., 2-3.30 p. m. Sunday and holidays, ship service last 10 minutes of each hour; rates, 12 cents per word.
² Loc. O. 97° 19' 00" E., N. 34° 10' 18"; range, 200; system, composite v. t. telegraph.
³ Loc. O. (approximately) 79° 37' 30" E., N. 40° 18' 00"; range, 180; system, Westinghouse v. t. telegraph.
⁴ Loc. O. (approximately) 157° 51' 00" E., N. 21° 18' 00"; range, 75; system, composite v. t. telephone.
⁵ Loc. O. (approximately) O. 157° 59' 00" E., N. 20° 47' 00"; range, 75; system, composite v. t. telephons.
⁶ Loc. O. 123° 45' 10" E., N. 13° 09' 00"; range, 100; system, U. S. Navy v. t. telegraph; hours, 8 a. m.-12 noon, 2-5.30 p. m. daily; 9-11 a. m., 2-3.30 p. m. Sunday and holidays, ship service last 10 minutes of each hour; rates, 12 cents per word.
⁷ Loc. O. 134° 14' 20" E., N. 56° 15' 45"; range, 150; system, R. C. A., 1000.
⁸ Loc. O. 122° 10' 00" E., N. 18° 26' 30"; range, 100; system, U. S. Army v. t. telegraph; hours, 8 a. m.-12 noon, 2-5.30 p. m. daily; 9-12 noon, 2-4.30 p. m. Sunday and holidays, ship schedule first 10 minutes of each hour.
⁹ Loc. O. 135° 28' 40" E., N. 57° 09' 50"; range, 30; system, composite, 400.
¹⁰ Loc. O. 124° 13' 45" E., N. 18° 47' 00"; range, 85; system, R. C. A., 1000; hours, 8 a. m.-12 noon, 2-5.30 p. m. daily; 9-11 a. m., 2-3.30 p. m. Sunday and holidays, ship service first 10 minutes of each hour; rates, 12 cents per word.

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 Berns Bureau]

Name of vessel	Call signal	Rates	Service	Hours	Owner of vessel	Station controlled by—
Azalea	KFSF		PG	X	Robinson Packing Corp.	
Conneaut ¹	WCU		PG	X	Wyandotte Transpn. Co.	Owner of vessel.
G. J. Grammer ²	KFSM		PG	X	Grammer S. S. Co.	R. C. A.
Greater Buffalo	WJA		PG	N	Detroit & Cleveland Navigation Co.	
Greater Detroit	WJT		PG	X	do	
Huron ³	WCH		P	X	Wyandotte Transpn. Co.	Owner of vessel.
L. D. Potter	KFSJ				L. D. Potter	
Mary Collins ⁴	KFSK	8	PG	X	Wilmington Towing Co.	Do.
Rotarian ⁵	KDOF	8	PG	X	W. E. Grace & Co.	Do.
Standard Service	KFS3	8	PG	X	Standard Oil Co.	
Winding Gulf ⁶	WFEE	8	PG	X	Casner, Curran & Bullitt.	Do.
Wm. F. Fitch ⁷	KFSN		PG	X	Jenkins S. S. Co.	R. C. A.

¹ Range, 150; system, composite v. t. telegraph; w. l., 300, 600, 750 (750 used for service with certain land and ship stations); rates, Great Lakes service 2 cents per word.
² Rates, Great Lakes service 8 cents per word.
³ Range, 150; system, composite v. t. telegraph; w. l., 300, 600, 750 used for service with certain land and ship stations.
⁴ Range, 150; system, Wireless Specialty Apparatus Co., 1000; w. l., 300, 600.

RADIO SERVICE BULLETIN

Commercial land and ship stations, alphabetically by call signals

[b—ship station; c—land station]

Call signal	Name	Call signal	Name
KDCF	Rotarian.....b	KZAD	Aparri, P. I.....c
KFSJ	L. D. Potter.....b	KZAG	San Vicente, P. I.....c
KFSK	Mary Collins.....b	KZAH	Virac, P. I.....c
KFSM	G. J. Grammer.....b	KZAJ	Legaspi, P. I.....c
KFSN	William F. Fitch.....b	KZE	Dillard, Okla.....c
KFSP	Azalea.....b	WCH	Huron.....b
KFSS	Standard Service.....b	WCU	Comenaut.....b
ERQ	Kaunapalapa, Hawaii.....c	WFEE	Winding Gulf.....b
KXD	Siglnaka Island, Alaska.....c	WJL	Greensburg, Pa.....c
KYB	Honolulu, Hawaii.....c	WJA	Greater Buffalo.....b
KYV	Pillar Bay, Alaska.....c	WJT	Greater Detroit.....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
Arnold, Pa.....	WCBU	Martinsburgh, W. Va.....	WDBD
Buck Hill Falls, Pa.....	WCBY	New Orleans, La.....	WESP
Cartersville, Mo.....	KFPW	Olympia, Wash.....	KFPF
Casper, Wyo.....	KFPS	Pine Bluff, Ark.....	KPPI
Chicago, Ill.....	WLS	Providence, R. I. (portable).....	WCBB
Chicago Heights, Ill.....	WCBZ	Salt Lake City, Utah.....	KFPH
Columbus, Ga.....	WDBA	San Francisco, Calif.....	KFPV
Denison, Tex.....	KFPQ	Spokane, Wash.....	KFPY
Des Moines, Iowa.....	WHO	Taunton, Mass.....	WDBB
Dublin, Tex.....	KFPL	Tullahoma, Tenn.....	WCBV
Jefferson City, Mo.....	KFPN	Washington, D. C.....	WJAY
Los Angeles, Calif.....	KFPR	Worcester, Mass.....	WCBT
Macon, Ga.....	WCBW	Do.....	WDBB

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

[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	Wave length	Power (watts)	Service
KFPH	Salt Lake City, Utah, 992 Lake St.	Howard C. Mallander.....	50	242	1,240
KFPL	Dublin, Tex., 205 Grafton St.	C. C. Baxter.....	20	242	1,240
KFPN	Jefferson City, Mo.....	Missouri National Guard, Headquarters Company, 70th Infantry Brigade.....	10	242	1,240
KFPF	Olympia, Wash., 110½ East Fourth St.	G. & G. Radio and Electric Shop.....	20	235	1,270
KFPQ	Denison, Tex., 1115 West Woodward St.	Clifford M. Esler.....	10	231	1,540
KFPR	Los Angeles, Calif.....	Los Angeles County Forestry Department.....	800	231	1,540
KFPS	Casper, Wyo.....	Carter A. Ross Motor Service Co.....	10	242	1,240
KFPV	San Francisco, Calif., 219 Nottoms St.	Heints & Kohlmoos.....	50	235	1,270
KFPW	Cartersville, Mo.....	St. Johns Church.....	30	268	1,420
KFPX	Pine Bluff, Ark.....	First Presbyterian Church.....	103	242	1,240
KFPY	Spokane, Wash.....	Symons Investment Co.....	108	233	1,260
WCBB	Providence, R. I. (portable), 42 Doyle Ave.	Charles H. Meester.....	6	246	1,220
WCBT	Worcester, Mass.....	Clark University.....	230	233	1,500
WCBU	Arnold, Pa.....	Arnold Wireless Supply Co.....	50	234	1,180
WCBV	Tullahoma, Tenn.....	Tullahoma Radio Club.....	10	232	1,190
WCBW	Macon, Ga.....	George F. Rankin, Jr., and Maitland Solomon.....	10	226	1,330
WCBY	Buck Hill Falls, Pa.....	Forks Electrical Shop.....	10	268	1,120
WCBZ	Chicago Heights, Ill.....	Coppotelli Brothers Music House.....	50	242	1,210
WDBA	Columbus, Ga., 2014 Talbotton St.	Fred Ray.....	20	236	1,270
WDBB	Taunton, Mass., 32 Weir St.	A. H. Waite & Co.....	10	229	1,210
WDBD	Martinsburgh, W. Va., Shenandoah Bank Bldg.	Herman E. Burns.....	5	236	1,120
WDBH	Worcester, Mass.....	C. T. Esher Co.....			
WESP	New Orleans, La., 815 Roosevelt St.	E. Budd Peddicoord.....	10	242	1,240
WHO	Des Moines, Iowa.....	Bankers Life Co.....	800	525	570

RADIO SERVICE BULLETIN

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—
Alameda, Calif.	6ZCC	F. Ives Deetken, 1525 Sixth St.
Asheville, N. C.	4XZ	E. A. Jackson, Jr., Fenner Ave.
Atlanta, Ga.	4XY	Pierre C. Harault, 105 East Ninth St.
Camp Alfred Vail, N. J.	2XBB	The Signal School.
Cherrydale, Va. (portable)	2XAB	Edwin L. White, 1 Columbia St.
Cherndon, Va.	2XAR	Harvey A. Daly, 124 Villa Road.
Cleveland, Ohio	6XBX	James W. Spear, 294 Euclid Heights Boulevard.
Dallas, Tex.	6XBF	J. Harold Robinson, 522 Cumberland St.
Evanston, Ill.	6XBF	Esterly C. Page, 725 Noyes St.
Grand Rapids, Mich.	8ZF	Frank W. Osborn, 1745 Horton Ave.
Hanover, N. H.	1XAV	Dartmouth College.
Haverford, Pa.	8ZG	Haverford College Radio Club.
Lexington, Ky. (near)	6XBH	Joseph C. Anderson, Glangarry.
Los Angeles, Calif.	6XBR	Charles E. Blalock, 637 1/2 South Catalina St.
Marietta, Ohio	8XB	Marietta College.
Minneapolis, Minn.	9XBI	Northern States Power Co.
North Little Rock, Ark.	6XBI	T. J. M. Daly, 808 Beech St.
Palo Alto, Calif.	6ZCD	W. A. Newman and L. W. Newman, 2130 Emerson St.
Polytechnic, Mont.	7XAG	Glenn E. West.
Portland, Oreg.	7XAH	E. H. Chambers, 1309 Taggart St.
Providence, R. I.	1ZQ	Alpha A. Learned, 78 Camp St.
Do	1ZB	Franklyn S. Buddy, 204 Bowen St.
San Gabriel, Calif.	6ZCB	Earl E. Zint, R. D. 2, P. O. Box 520.
Springfield, Del.	3ZF	Don. L. Lusk, North Rolling and State Roads.
Uyak, Alaska	7XAI	Alaska Packers Association.
Washington, D. C.	3XO	E. D. Smith, 219 Ritterhouse St.
West Alexandria, Pa.	8ZQ	Warren F. Cogg, 92 West Dayton St.
West Palm Beach, Fla.	4XB	R. C. Bender, 316 Banyan St.
Wilkes-Barre, Pa.	8XBY	Pennsylvania Power & Light Co.
Williamsport, Pa.	8XBE	Do.
Winston-Salem, N. C.	4XF	Francis E. Beaudry, 421 West End Boulevard.
Ypsilanti, Mich.	8ZO	Charles Gault, 338 Maple St.

Special land stations, grouped by districts

Call signal	District and station	Call signal	District and station
1XAV	First district:	6XBR	Sixth district:
1ZQ	Hanover, N. H.	6ZCB	Los Angeles, Calif.
1ZB	Providence, R. I.	6ZCC	San Gabriel, Calif.
2XBB	Providence, R. I.	6ZCD	Alameda, Calif.
2XBB	Second district: Camp Alfred Vail, N. J.	6ZCD	Palo Alto, Calif.
2XAR	Third district:	7XAG	Seventh district:
2XAB	Cherndon, Va.	7XAH	Polytechnic, Mont.
3XO	Cherrydale, Va. (portable)	7XAI	Portland, Oreg.
3ZF	Washington, D. C.	8XB	Uyak, Alaska.
3ZF	Springfield, Del.	8XBY	Eighth district:
8ZG	Haverford, Pa.	8XBE	Marietta, Ohio.
4XB	Fourth district:	8ZO	Cleveland, Ohio.
4XF	West Palm Beach, Fla.	8ZF	Wilkes-Barre, Pa.
4XY	Winston-Salem, N. C.	8ZQ	Williamsport, Pa.
4XZ	Atlanta, Ga.	8ZQ	Ypsilanti, Mich.
4XZ	Asheville, N. C.	8ZQ	Grand Rapids, Mich.
6XBH	Fifth district:	8ZQ	West Alexandria, Pa.
6XBI	Dallas, Tex.	9XBF	Ninth district:
6XBI	North Little Rock, Ark.	9XBF	Evanston, Ill.
			Lexington, Ky. (near).

RADIO SERVICE BULLETIN

5

ALTERATIONS AND CORRECTIONS

COMMERCIAL LAND STATIONS

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

- BATANGAS, P. I.—Range, 200-1000; w. l., 600, 1400, 2000, 3000; hours, ship service first 10 minutes of each hour.
- BOLINAS, CALIF. (KPH).—System, R. C. A. v. t. telegraph and spark, 1000; w. l., 300, 600, 2200.
- CLEVELAND, OHIO (WTK).—System, Navy-Simon, 1000.
- EL DORADO, KANS.—Station operated and controlled by Skelly Oil Co.
- FRANKFORT, MICH.—Rates, ship service, 10 cents per word.
- FUNTER, ALASKA.—Station operated and controlled by Thlinket Packing Co.
- ILOILO, P. I.—W. l., add 950, 1200, 1950.
- MANITOWOC, WIS.—Rates, ship service 10 cents per word.
- NEW ORLEANS, LA.—System, R. C. A. v. t. telegraph and composite spark, 1000; w. l., 300, 600, 1713, 2850, 3331, 4107.
- NEW YORK, N. Y. (WBC).—Call signal changed to WSE.
- PHILADELPHIA, PA.—W. l., 300, 600, 1704.
- PORT WALTER, ALASKA.—Range, 150; system, Wireless Specialty Apparatus Co., 1000; w. l., 300, 550, 600.
- ROGERS, MICH.—System, composite v. t. telegraph and composite spark, 1000; w. l., 300, 600, 1764, 1800; rates, ship service 10 cents per word; minimum \$1.
- SCHUMIGAN, ALASKA.—Changed to Squaw Harbor, Alaska; service, PG; rates, 6 cents per word; station operated and controlled by Shumigan Packing Co.
- TULSA, OKLA.—Station operated and controlled by Skelly Oil Co.
- WEST PORT ARTHUR, TEX.—Changed to Port Arthur, Tex.; w. l., 300, 600, 1070, 1800, 1950, 2050.
- WILMINGTON, CALIF.—W. l., 300, 600.
- Strike out all particulars of the following-named stations: Big Creek (Camp 62), Calif., East Moriches, N. Y.

COMMERCIAL SHIP STATIONS ALPHABETICALLY BY NAMES OF VESSELS

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

- ADLER.—Range, 150; system, Cutting & Washington, 1000; W. G. Coyle & Co., owner of vessel.
- ADMIRAL PEARY.—W. l., 300, 600.
- ALPENA.—Range, 150; system, composite v. t. telegraph, w. l., 300, 600, 760; service, P; station operated and controlled by owner of vessel.
- AMERICAN FARMER.—Range 300; system, Navy-R. C. A., 1000; w. l., 300, 450, 600, 706.
- AMERICAN SHIPPER.—Range, 300; system, Navy-R. C. A., 1000; w. l., 300, 450, 600, 706; station operated and controlled by S. O. R. S.
- A. M. BYERS.—System, Navy-Simon, 1000; w. l., add 706; station operated and controlled by owner of vessel.
- ANN ARBOR No. 5.—Rates, Great Lakes service 6 cents per word; station operated and controlled by owner of vessel.
- ANN ARBOR No. 6.—Rates, Great Lakes service 6 cents per word; station operated and controlled by owner of vessel.
- ANTIETAM.—System, Navy-R. C. A., 1000; w. l., 300, 450, 600, 706.
- APEX.—W. l., 300, 600.
- AQUIDABAN.—Range, 100; system, composite v. t. telegraph, w. l., 300, 600, rates, 8 cents per word; station operated and controlled by owner of vessel.
- ASHBEE.—W. l., 300, 450, 600, 706; station operated and controlled by R. C. A.
- BRAVE COEUR.—W. l., add 706.
- BRINDILLA.—Mario Olivetti owner of vessel.
- CADARETTA.—Station operated and controlled by Federal Telegraph Co.
- CADDOPEAK.—W. l., add 706; station operated and controlled by Federal Telegraph Co.
- CARL D. BRADLEY.—Call signal changed to KFSI.
- CASTLE POINT.—Name changed to Hamlin F. McCormick; w. l., 300, 600, 706.
- CASTLE TOWN.—W. l., 300, 600, 706; station operated and controlled by Federal Telegraph Co.
- CATHLAMET.—Range, 200; w. l., add 706.

- COALINGA.—W. l., add 2100, 2400; Union S. S. Co. owner of vessel.
- COCKAPONSET.—System, Navy-Lowenstein, 1000; w. l., 300, 450, 600, 706.
- COLOMBIA.—System, Federal arc, 1000 with chopper; w. l., 300, 600, 706, 1800, 2400.
- CULBURRA.—Range, 150; system, R. C. A., 1000; w. l., 300, 600, 706; rates, 8 cents per word; station operated and controlled by R. C. A.
- CURRIER.—W. l., add 706.
- DUQUESNE.—W. l., add 706.
- EDWARD PEIRCE.—W. l., 300, 600, 706.
- ELIA.—Range, 150; system, Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600, 706; service, PG; hours, X; rates, 8 cents per word; station operated and controlled by owner of vessel.
- EMMA ALEXANDER.—System, R. C. A. v. t. telephone and Wireless Specialty Apparatus Co., 1000; w. l., 300, 600, 706; 870-870 used for telephone service with certain vessels.
- ESTRADA PALMA.—W. l., add 706.
- FELIX TAUSSIG.—W. l., add 706.
- GDANSK.—Name changed to Sierra.
- GEORGIAN.—System, R. C. A., 1000; w. l., add 706.
- GLYMONT.—W. l., 300, 600, 706; station operated and controlled by Federal Telegraph Co.
- GREYLOCK.—W. l., 300, 600, 706, 1800, 2100, 2400.
- HALO.—Station operated and controlled by I. W. T. Co.
- HANNAWA.—W. l., 300, 600, 706, 1800, 2100, 2400.
- HAROLD WALKER.—W. l., add 706.
- H. F. ALEXANDER.—System, R. C. A. v. t. telephone and telegraph and R. C. A., 1000; w. l., 300, 600, 706, 870, 2100, 2400-870 used for telephone service with certain vessels.
- HUGOTON.—Station operated and controlled by I. W. T. Co. (U. S. L.).
- JACOB LUCKENBACH.—System, Federal arc and Kilbourne & Clark, 1000; w. l., 300, 600, 706, 1800, 2400; hours, X.
- JEFFERSON (KOD).—W. l., add 706; hours, N.
- JOHN P. REISS.—System, Navy-Simon, 1000; w. l., add 706; station operated and controlled by owner of vessel.
- JOHN W. BOARDMAN.—System, composite v. t. telegraph; w. l., 300, 600, 750; station operated and controlled by owner of vessel; 750 used for service with certain land and ship stations.
- J. R. GORDON.—W. l., add 706; station operated and controlled by I. W. T. Co.
- LEWIS K. THURLOW.—W. l., add 706.
- LEWIS LUCKENBACH.—W. l., 300, 600, 706.
- LYDIA.—System, Navy-Simon, 1000.
- MAJOR WHEELER.—Porto Rico-American S. S. Co. owner of vessel.
- MAKENA.—W. l., add 706.
- MARGARET.—W. l., add 706.
- MAUI.—W. l., 300, 600, 706.
- MISKIANZA.—W. l., add 706.
- MOHAWK (KXE).—Range, 150; w. l., 300, 600, 706; hours, N.
- MONTAUK.—System, Navy-R. C. A., 1000; w. l., add 706; rates, 8 cents per word.
- MONTEBELLO.—System, R. C. A. v. t. telephone and telegraph; w. l., 300, 600, 706, 870-870 used for telephone service with certain vessels.
- NEWTON.—W. l., add 706.
- NEW YORK (KUW).—Station operated and controlled by I. W. T. Co.
- OPHIS.—Range, 300; system, Navy-Kilbourne & Clark, 1000.
- OREGON.—System, Wireless Specialty Apparatus Co., 1000; w. l., add 706; Independent S. S. Co. owner of vessel; station operated and controlled by owner of vessel.
- ORMIDALE.—Rates, 8 cents per word.
- PAUL SHOUP.—System, Gray & Danielson, 240; station operated and controlled by owner of vessel.
- PERE MARQUETTE.—Rates, Great Lakes service, 6 cents per word.
- PERE MARQUETTE 17.—Rates, Great Lakes service, 6 cents per word.
- PERE MARQUETTE 18.—Rates, Great Lakes service, 6 cents per word.
- PERE MARQUETTE 19.—Rates, Great Lakes service, 6 cents per word.
- PERE MARQUETTE 20.—Rates, Great Lakes service, 6 cents per word.

RADIO SERVICE BULLETIN

7

- PETER REISS.—Range, 200; system, Navy-Simon, 1000; w. l., add 706; station operated and controlled by owner of vessel.
- PLYMOUTH (KXH).—Range, 150; w. l., 300, 600, 706.
- PRESIDENT ARTHUR.—Call signal changed to WES.
- PRESIDENT LINCOLN.—W. l., 300, 600, 706, 2100, 2400.
- PRESIDENT VAN BUREN.—Dollar S. S. Line owner of vessel; station operated and controlled by I. W. T. Co.
- PRISCILLA (KFSE).—Range, 200; system, I. W. T. Co., 1000; w. l., 300, 450, 600, 706; station operated and controlled by I. W. T. Co.
- PROGRESS.—Station operated and controlled by R. C. A.
- RAJAH.—W. l., 300, 600, 706.
- REAPER.—W. l., add 706; station operated and controlled by I. W. T. Co.
- REPUBLIC (KSN).—Range, 300; system, Federal arc and Navy-Lowenstein, 1000; w. l., 300, 450, 600, 706, 1800, 2100, 2400; station operated and controlled by I. W. T. Co.
- RICHARD HOLYOKE.—Range, 150; system, Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600, 706; rates, 8 cents per word; station operated and controlled by owner of vessel.
- ROBERT M. THOMPSON.—George Hall Corp. owner of vessel.
- ROBIN ADAIR.—W. l., add 706.
- RUBY.—George Hall Corp. owner of vessel.
- RUTH ALEXANDER.—W. l., 300, 600, 706, 1800; hours, N.
- SAMUEL MITCHELL.—Range, 150; system, composite v. t. telegraph; w. l., 300, 600, 750-750 used for service with certain land and ship stations; station operated and controlled by owner of vessel.
- SANTA CRUZ.—W. l., 300, 600, 706.
- SANTA INEZ.—W. l., 300, 600, 706.
- SEA SALVOR.—W. l., 300, 600, 706.
- SHREVEPORT.—Station operated and controlled by I. W. T. Co.
- SOLANA.—W. l., add 706, 2100, 2400.
- STAR OF ALASKA.—Range, 150; system, Navy 1000; w. l., 300, 600, 706; station operated and controlled by owner of vessel.
- STAR OF ENGLAND.—Range, 150; system, Navy, 1000; w. l., 300, 600; station operated and controlled by owner of vessel.
- STAR OF FINLAND.—Range, 150; system, R. C. A., 1000; w. l., 300, 600.
- STAR OF GREENLAND.—System, Gray & Danielson; 480; rates, 8 cents per word.
- STAR OF ICELAND.—Range, 150; system, Navy, 1000; w. l., 300, 600; rates, 8 cents per word; station operated and controlled by owner of vessel.
- STAR OF LAPLAND.—System, Halcin, 240; w. l., 300, 600; 8 cents per word.
- STEEL NAVIGATOR.—W. l., add 706.
- SUCUBACO.—Range, 300; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600, 706.
- SWIFT WIND.—Read Swiftwind; New England Oil S. S. Co. owner of vessel.
- TEXAS.—System, R. C. A., 1000; w. l., 300, 450, 600, 706.
- THOMAS H. WHEELER.—W. l., add 706.
- TOTECO.—W. l., 300, 450, 600, 706; station operated and controlled by R. C. A.
- TRINIDADIAN.—W. l., add 706.
- VENEZUELA.—Range, 300; system, Federal arc and Federal spark, 1000; w. l., 300, 600, 706, 1800, 2100, 2400.
- WABASH.—B. W. W. Newhall owner of vessel.
- WEST CAYOTE.—W. l., add 706.
- WEST FARALON.—W. l., 300, 600, 706, 2100, 2400.
- WESTERN LIGHT.—W. l., add 706.
- WEST HENSHAW.—Station operated and controlled by I. W. T. Co.
- WEST JENA.—System, Navy-R. C. A., 1000; w. l., add 706.
- WEST TACOOK.—System, Navy-Kilbourne & Clark, 1000; station operated and controlled by S. O. R. S.
- WILLIAM K. FIELD.—Range, 300; system, Navy-Simon, 1000; w. l., 300, 600, 706, 1800; rates, Great Lakes service, 2 cents per word.
- WILLIAM N. PAGE.—W. l., add 706.
- W. R. CHAMBERLAIN, JR.—Range, 150; system, R. C. A., 1000; w. l., add 706; station operated and controlled by R. C. A.
- W. S. RHEEM.—W. l., add 706.
- WYANDOTTE (WCO).—System, composite v. t. telegraph; w. l., 300, 600, 750-750 used for service with certain other land and ship stations; station operated and controlled by owner of vessel.

Strike out all particulars of the following-named vessels: Admiral Nicholson; Beatrice, Cauto, Guantanamo, Madison, Yuma.

The following-named vessels the radio stations of which are operated by the Radio Corporation of America have increased their rates to 4 cents per word, effective April 1, last: A. D. McBeth, Alabama (WFB), Arizona, 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, P. B. Squire, Harry W. Croft, Harvey H. Brown, 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 8, Petoskey, Pilgrim, Puritan, Secandbee, Sir Thomas Shaughnessy, South American, State of Ohio, Stellaris, The Harvester, Tionesta, Western States, Westland (KDOY), William G. Mather.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS

KDSI, read Swiftwind; KESD, read Hamlin F. McCormick; KHI, read Squaw Harbor, Alaska; WBC (New York, N. Y.), call signal changed to WSE; WGN, call signal changed to KFSI; WHJ, read Sierra; WLS, call signal changed to WES; WPA, read Port Arthur, Tex.; strike out all particulars following the call signals KGT, KLJ, KMAA, KVP, KWF, KWN, WJAI, WSE (East Moriches, N. Y.).

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]

KDYQ (Portland, Oreg.).—Power, 50.
 KPBC (San Diego, Calif.).—Power, 15.
 KPBE (San Luis Obispo, Calif.).—W. l., 242, frequency, kc. 1240.
 KFCZ (Omaha, Nebr.).—Power, 50.
 KFDH (Tucson, Ariz.).—Power, 50, w. l., 268, frequency, kc. 1120.
 KFEZ (St. Louis, Mo.).—Station operated and controlled by Associated Engineering Societies of St. Louis; power, 250; w. l., 248; frequency, kc. 1210.
 KFFY (Alexandria, La.).—Power, 50.
 KFGZ (Berrien Springs, Mich.).—Power, 500; w. l., 286; frequency, kc. 1050.
 KFHD (St. Joseph, Mo.).—Station operated and controlled by Utz Electric Shop Co.
 KFKA (Greeley, Colo.).—W. l., 273, frequency, kc. 1100.
 KFKQ (Conway, Ark.).—Power, 100; w. l., 250; frequency, kc. 1200.
 KFLB (Menominee, Mich.).—Power, 50.
 KNT (Aberdeen, Wash.).—Changed to Kukak Bay, Alaska; station operated and controlled by Walter Henrich, P. O. Box 511 (Aberdeen, Wash.), power, 100.
 WABB (Harrisburg, Pa.).—Station operated and controlled by Harrisburg Sporting Goods Co.
 WBAP (Fort Worth, Tex.).—Power, 750.
 WBBG (Mattapoisett, Mass.).—Power 250.
 WBBI (Indianapolis, Ind.).—Power, 10.
 WCAK (Houston, Tex.).—Power, 10.
 WCBG (Pascagoula, Miss., portable).—W. l., 266; frequency, kc. 1120.
 WEAF (New York, N. Y.).—Power, 1,000.
 WEAR (Baltimore Md.).—Station operated and controlled by Evening News Publishing Co., w. l., 261; frequency, kc. 1150.
 WGN (Chicago, Ill.).—W. l., 370; frequency, kc. 810.
 WIAS (Burlington, Iowa).—W. l., 283; frequency, kc. 1060.
 WIL (Washington, D. C.).—Power, 5.
 WLAV (Pensacola, Fla.).—Power, 20.
 WLAT (Philadelphia, Pa.).—Power, 100.
 WRAZ (Newark, N. J.).—Call signal changed to WCBX; power, 100.
 WTAB (Fall River, Mass.).—Power, 100; w. l., 266; frequency, kc. 1130.
 WTAU (Tecumseh, Nebr.).—W. l., 242; frequency, kc. 1240.
 WWI (Dearborn, Mich.).—Power, 250.
 WYU (Phoenix, Ariz.).—Power, 100; w. l., 266; frequency, kc. 1130.

RADIO SERVICE BULLETIN

9

Wash.; KFHS, Lihue, Hawaii; KFJW, Towanda, Kans.; KPOB, Minneapolis, Minn.; KNV, Los Angeles, Calif.; KSS, Long Beach, Calif.; KUS, Los Angeles, Calif.; WBAD, Minneapolis, Minn.; WBBI, Indianapolis, Ind.; WCAY, Milwaukee, Wis.; WJAF, Muncie, Ind.; WMAW, Wabpeton, N. Dak.; WMAZ, Macon, Ga.; WPAQ, Frostburg, Md.; WQAD, Waterbury, Conn.

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]

KANKAKEE.—Strike out all particulars.

O-5.—Strike out all particulars.

YOCONA.—Strike out all particulars.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS

Strike out all particulars following the call signals, NAMZ, NUMZ, NUNB.

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]

ABERDEEN, WASH. (7XAE).—Changed to Kukak Bay, Alaska.

BALTIMORE, MD. (3YH).—Station operated and controlled by Central Y. M. C. A.

EAGLE ROCK, CALIF. (6XAT).—Changed to Los Angeles, Calif., 5118 Maywood Ave.

SPRINGVALE, CONN. (1XAK).—Read Springdale, Conn.

VENICE, CALIF. (6XBN).—Changed to Oakland, Calif.

Strike out all particulars of the following-named stations: Baldwinsville, N. Y. (8XAV); Cincinnati, Ohio (8YS); Cleveland, Ohio (8ZP); Clifton, Ariz. (6XBH); Dunmore, Pa. (8ZQ); Fort Worth, Tex. (5YV); Friendship Heights, Md. (3ZF); Macon, Ga. (4XL); New York, N. Y. (2XAT); Oakland, Calif. (6XAM); Philadelphia, Pa. (3XK); Philadelphia, Pa. (3XS); Philadelphia, Pa. (3ZG); Philadelphia, Pa. (3YC); Salt Lake City, Utah (6XBG); Seattle, Wash. (7XR).

MISCELLANEOUS

CANADIAN BROADCASTING STATIONS

The following-named Canadian broadcasting stations should be added to the list of stations published in the January edition of the Radio Service Bulletin, page 8:

Call signal	Owner of station	Location of station	Wave length
CFXC	Westminster Trust Co.	New Westminster, British Columbia	440
CHCB	Marconi Wireless Telegraph Co. of Canada	Toronto, Ontario	440
CHCM	Riley & McCormack (Ltd.)	Calgary, Alberta, 712 Rosedale Crescent	440
CHCS	The Hamilton Spectator	Hamilton, Ontario	410
CJCM	J. L. Philippe Landry	Mont Joli, Quebec	400
CKCH	Canadian National Railways	Ottawa, Ontario	435
CKCO	Dr. G. M. Geldert (for Ottawa's Radio Association.)	Ottawa, Ontario, 282 Somerset St. W.	400
CKCX	P. Burns & Co. (Ltd.)	Calgary, Alberta, 712 Rosedale Crescent	440

RADIO BEACON ESTABLISHED AT NOVA SCOTIA

An automatic radio beacon has been established at Seal Island, Nova Scotia, in latitude 43° 23' 28" N., longitude 66° 01' 00" W. The station will transmit on a wave length of 1,000 meters with a spark frequency of 500. The characteristic of the station will be a series of groups, each consisting of two dots and two dashes, transmitted for a period of 60 seconds, followed by a silent interval of 4 minutes. The station will be in operation continuously during thick or foggy weather. The transmitting range is about 25 miles.

Mexican broadcasting stations

Call signal	Location of station	Wave length (meters)	Power (watts)
CYB.....	Mexico City.....	350 to 550.....	500
CYL.....	do.....	350 to 550.....	500
CYX.....	do.....	350 to 550.....	500
CYR.....	Mazatlan.....	350 to 550.....	250

NEW SERVICE AT LAND'S END STATION

The bureau has been informed that within a short time the Land's End, England, coast station will inaugurate a constant service on 800 meters.

SHIP SCHEDULE FOR PHILIPPINE COAST STATIONS

Coast stations of the Philippines are open to ship traffic 10 minutes of each hour during the period the station is open. The stations and the time they are open to ship traffic is as follows: Amuguis, Bongao, Cuyo, Isabela de Basilan, Malabang, Mati, San Francisco, 15 minutes to 25 minutes past the hour; Jolo, Lebak, Malangas, Puerto Princesa, San Jose, Siasi, 30 minutes to 40 minutes past the hour; Cebu, Culion, Malita, 45 minutes to 55 minutes past the hour; Basco, Cagayan de Sulu, Calapan, last 10 minutes of each hour; Balabac, Batangas, Davao, Iloilo, Zamboanga, first 10 minutes of each hour.

The first 5 minutes of each of the 10-minute periods shown above shall be devoted by the respective coastal stations to "listen in" for ship signals on 600 meters and the rest to the exchange of radiograms, should there be any. Should there be no message to be transmitted to or received from any ship, the coastal station shall go ahead with its regular schedule with other coastal stations. Should the exchange of radiograms be not finished within the prescribed 10-minute period, the coastal station operator may extend the period until all radiograms shall have been transmitted, provided that such procedure shall, in his judgment, not delay other business too long; otherwise, the ship station shall be advised that the exchange of radiograms may be resumed at the next hour. The times specified in the ship schedule of Government coastal stations is that corresponding to 120° E., G. M. T., and is uniform throughout the Philippines regardless of the place. Ship operators are therefore requested to keep this time in Philippine waters.

As soon as possible, and during the ship schedule, the coast station will transmit the general call signal, CQ, and listen in for 5 minutes. If no call is heard, the coast station shall go ahead with its regular schedule with other coastal stations.

INFORMATION FROM THE BERNE BUREAU

Netherlands.—The legal time has been advanced 1 hour, beginning March 30, last, and ending October 5, next.

Spain.—The coast station Ceuta is open to public correspondence with ships crossing the Strait of Gibraltar. The rate is 45 centimes per word, minimum 4 francs, 50 centimes.

British India.—Beginning April 1, last, the coast rate for the stations Bombay, Calcutta, Karachi, Madras, Port Blair, Rangoon, and Victoria Point will be 60 centimes per word.

Germany.—The coastal rate of all German stations open to general public correspondence is 25 centimes per word, minimum 2 francs. The rate for ship stations (except naval stations) is 25 centimes per word, minimum 2 francs, 40 centimes. These changes are effective beginning April 1, last.

Belgium.—The legal time has been advanced 1 hour, beginning March 30, last.

France.—The legal time has been advanced 1 hour, beginning March 30, last.

England.—The legal time has been advanced 1 hour, beginning April 13, last.

Scotland.—The legal time has been advanced 1 hour, beginning April 13, last.

Wales.—The legal time has been advanced 1 hour, beginning April 13, last.

RADIO SERVICE BULLETIN

11

NAVIGATIONAL WARNINGS BY RADIO FROM BRITISH STATIONS

Radio navigational warnings containing information relating to derelicts, temporary extinction of lights, or displacement of principal aids to navigation, drifting mines, and other important hydrographic matter are transmitted to shipping in accordance with the particulars given in the under-mentioned schedules:

Schedule I

Name of station	Call signal	Time (G. M. T.)	Wave (meters)	Remarks
Land's End.....	GLD	0200, 0800, 1400, 2000....	600	Broadcasts to shipping in English Channel and Bay of Biscay.
Fishguard.....	GRL	0330, 0910, 1530, 2100....	600	Broadcasts to shipping approaching or leaving St. George's Channel and Bristol Channel.
Port Patrick.....	GPK	0330, 0910, 1530, 2100....	600	Broadcasts to shipping in North Channel and Firth of Clyde.
Wick.....	GKR	0200, 0800, 1400, 2000....	600	Broadcasts to shipping in North Sea and to shipping approaching or leaving Pentland Firth.
Cullercoats.....	GCC	0330, 0910, 1530, 2100....	600	Broadcasts to shipping in North Sea.
North Foreland.....	GNF	0200, 0800, 1400, 2000....	600	Broadcasts to shipping in North Sea and English Channel.
Valentia (Ireland).....	GCK	0330, 0910, 1530, 2100....	600	Broadcasts to shipping in Atlantic Ocean.
Malin Head.....	GHM	0200, 0800, 1400, 2000....	600	Do.

The messages are first of all transmitted immediately upon receipt by the stations concerned, and then at the above-mentioned times. The transmission of the warnings is continued as long as considered necessary. The warnings message will be preceded by the radiotelegraph danger call (TTT), repeated at short intervals 10 times on full power. The warning is broadcast 1 minute later and repeated at an interval of 10 minutes.

Schedule II

Name of station	Call signal	Time (G. M. T.)	Wave (meters)	Remarks
Niton.....	GNI		600	Does not broadcast, but advises every ship approaching or leaving the port of Southampton.
Seaforth.....	GLV		600	Does not broadcast, but advises every ship approaching or leaving the port of Liverpool.

List of vessels equipped with Kolster radiocompass

Name of vessel	Owner of vessel	Name of vessel	Owner of vessel
President McKinley	U. S. Shipping Board.	K. H. Kingsbury	Standard Oil Co. of California.
Leviathan	Do.	W. S. Miller	Do.
H. F. Alexander	Admiral Line.	Richmond	Do.
Ruth Alexander	Do.	D. G. Scofield	Do.
Dorothy Alexander	Do.	H. T. Harper	Do.
Admiral Farragut	Do.	W. S. Rhoem	Do.
Admiral Dewey	Do.	H. M. Storey	Do.
Admiral Schley	Do.	Lubrico	Do.
Admiral Fiske	Do.	Sequoia	U. S. Lighthouse Service.
Emma Alexander	Do.	Orcid	Do.
Matsonia	Matson Navigation Co.	Madrono	Do.
Mani	Do.	Mojave	U. S. Coast Guard Service.
Wilhelmina	Do.	Rose City	San Francisco & Portland S. S. Co.
Manoa	Do.	Grant	U. S. Army Transport Service.
Lurline	Do.	Liebre	General Petroleum Corp.
Maunani	Do.	Yerba Linda	Do.
Maunakali	Do.	Los Alamos	Do.
Mauna Ala	Do.	Lebec	Do.
Makiki (formerly Woonsocket)	Do.	Ermita	Do.
J. A. Moffett	Standard Oil Co. of California.	Mojave	Do.
S. C. T. Dodd	Do.	Tejon	Do.
R. J. Hanna	Do.		

MALIN HEAD STATION WEATHER BULLETINS

Beginning February 20, last, Malin Head, Ireland, station will send out a weather bulletin at 0930 and 2130, instead of at 0900 and 2100.

SECURITY OF MESSAGES

The bureau has been informed of violation of regulation 19, of the act of August 13, 1912, in that unauthorized persons disclosed the contents of messages which were intercepted. Anyone found guilty of violating this regulation may expect to be punished according to law. The regulation is herewith published for the benefit of all concerned:

No person or persons engaged in or having knowledge of the operation of any station or stations, shall divulge or publish the contents of any messages transmitted or received by such station, except to the person or persons to whom the same may be directed, or their authorized agent, or to another station employed to forward such message to its destination, unless legally required to do so by the court of competent jurisdiction or other competent authority. Any person guilty of divulging or publishing any message, except as herein provided, shall, on conviction thereof, be punished by a fine of not more than two hundred and fifty dollars or imprisonment for a period of not exceeding three months, or both fine and imprisonment, in the discretion of the court.

RADIOCOMPASS STATION DIRECTIONS FOR GERMAN STATIONS

1. *General.*—The three D/F stations (Borkum, Nordholz and List) in the North Sea generally determine the bearings simultaneously; each station also furnishes on demand individual (or single) bearings. In the former case the three stations operate under the direction of the W/T control station (Wilhelmshaven), which transmits the bearings to the ship demanding them. When an individual bearing is required, the ship communicates direct with the W/T station of the D/F station concerned.

2. *Wave length.*—The wave length employed for calling, communicating, and determining the bearing is that of 800 meters, exclusively.

3. *Calling and method of procedure.*—(a) Bearings from three D/F stations: The ship calls the control station, Wilhelmshaven III. entrance (call signal KAN), in the usual manner on the 800-meter wave, using the abbreviation.

QTE?—What is my true wireless bearing?

KAN acknowledges the signal, and when the D/F stations are ready to determine the bearing, sends the signal K (—•—).

The ship proceeds to transmit her call signal for one to two minutes on the 800-meter wave (sharp tuning is necessary), prolonging the dashes a little; she then waits for KAN's reply:

QTE—Your true bearing is degrees.

The ship acknowledges the receipt of the bearings in the usual manner, repeating the figures, followed by the end of work signal, which is repeated by KAN.

The time given in the message is central European time (0000—2359), commencing at midnight, the first two figures denoting the hours and the last two figures the minutes. The bearings in degrees are given clockwise from the D/F station concerned; and they are transmitted immediately after the call signal of the D/F station.

When a vessel does not require bearings, but her geographical position determined from bearings, she should use the abbreviation:

QTE?—What is my ship's position by wireless bearing?

The method of procedure is similar, except that KAN, instead of transmitting bearings, gives the position of the ship in latitude and longitude as in the following example:

... .. 54 11 North;
... .. 6 50 30 East;

or, by the aid of two groups of four figures and one group of two letters, which signify:

First group of four figures = degrees and minutes of latitude.

Second group of four figures = degrees and minutes of longitude.

(If the number of degrees and minutes is less than 10, the figure of the tens is replaced by 0, thus, 05 = 5°).

In the third group the first letter indicates the latitude (N = North, S = South) and the second that of the longitude (O = Ost (East), W = West).

(b) Individual bearings: The ship calls direct, on 800-meter waves, the W/T

RADIO SERVICE BULLETIN

13

4. *Accuracy of bearings.*—(a) All necessary precautions are taken in order that the bearings are determined as accurately as possible. Nevertheless, vessels are warned that no responsibility can be accepted by the German naval directorate in respect of erroneous D/F bearings and their consequences.

(b) The conditions that should be fulfilled for obtaining a good bearing are to transmit consistently clear, steady signals of medium power, on a sharply tuned wave.

(c) When the coast line is nearly parallel with that of the direction of the bearing, the latter is subject to large variation; a similar divergence occurs when the line of bearing passes over sea and land alternately, and also at sunset. Vessels are therefore not recommended to ask for bearings when these conditions prevail.

(d) The bearings transmitted by List D/F station (Blidselbucht) are inaccurate in the sector the limits of which are approximately: List D/F station—Rotersand light—and List D/F station—Karolinensiel mill. For this sector the bearing will be given as "187 bis 194" (187° to 194°). In the event of any vessel finding herself in this sector and no other method of determining her position being available, the mean bearing of 190° may be assumed, if deemed advisable.

(e) Ships are recommended to make frequent use of the D/F stations more particularly in clear weather when the position can be checked in order to familiarize themselves with D/F procedure and become acquainted with the accuracy of D/F bearings.

5. *Reports.*—The navigator who knows his exact position, can furnish very valuable data on the correctness of D/F bearings, and is invited to forward a brief report to the Chef der Marineleitung, Berlin, containing the following information:

Name of ship.
Date, hour, and minutes of D/F bearing.
Position of ship in latitude and longitude (degrees and minutes).
Name of D/F station.
True bearing of ship from D/F station, according to exact position.
D/F bearing.
D/F bearing error.
Distance of ship from D/F station.
Position of ship according to the control station.
Wave length.
Was the true bearing of the ship correct?
Weather and general remarks.

6. *Charges.*—Until further notice, no charge will be made for the D/F service.

7. *Example.*—

Wilhelmshaven control station call signal—KAN.

S. S. Kleist call signal—DST.

Borkum W/T—KBM.

Borkum D/F—KBO.

Nordholz W/T—KBN.

Nordholz D/F—KBQ.

List W/T—KAL.

List D/F—KAO.

S. S. Kleist requires bearings from each of the three D/F stations.

1015 (800 m.) — . . . — KAN KAN V(de) DST DST — . . . — QTE . . .
— . . . — . . . —

1016 (800 m.) — . . . — DST DST V(de) KAN KAN . . . — . . . — . . .

(1017 Call of the control station to the D/F stations on a wave length other than 800 meters: "Peilung (bearing) DST").

1018 (800 m.) — . . . — — — DST DST V(de) KAN — . . . —

1018 (800 m.) — . . . — KAN KAN V(de) DST — . . . — DST DST DST
(call signal, for one to two minutes, prolonging the dashes) — . . . —
DST . . . — . . .

(1019 The D/F stations transmit their results on a wave length other than 800 meters to KAN.)

1021 (800 m.) — . . . — DST DST V (de) KAN — . . . — QTE 1018 KAO
221 KBQ 275 KBO 357 — . . . — KAN . . . — . . . —

1022 (800 m.) — . . . — KAN KAN V(de) DST — . . . — 1018 221 275 357
. . . — . . . — . . . —

1023 (800 m.) — . . . — DST DST V(de) KAN . . . — . . . — . . . —

Remarks.—Communications between KAN and the D/F stations are exchanged on a wave length other than 800 meters so as not to interfere with the messages

RADIO INSTRUMENTS AND MEASUREMENTS

Owing to the rapid growth of radio communication, the appliances and methods used have undergone frequent and radical changes. In this growth progress has been made largely by new inventions and applications and comparatively little attention has been paid to the refinements of measurement. Bureau of Standards Circular 74, Radio Instruments and Measurements, presents information regarding the more important measurements used in radio work. Many of the matters dealt with are or have been under investigation in the laboratory of the Bureau of Standards and are not treated in previously existing publications. No attempt is made in this circular to deal with the operation of apparatus in sending and receiving. This circular is of value to those persons interested in making radio measurements.

The first edition was issued March 23, 1918. A number of corrections and revisions have been made in the present edition and the bibliography of radio publications has been extended.

The second edition of Circular 74, Radio Instruments and Measurements, is now ready. A copy of this circular may be obtained for 60 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C.

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.

Station	Owner	Location	Assigned frequency (kilocycles)	Period covered by measurements (1923-24) ¹	Number of times measured	Greatest deviation from assigned frequency since Mar. 16, 1924	Average deviation from assigned frequency
						<i>Per ct.</i>	<i>Per ct.</i>
NBS	U. S. Navy	Annapolis, Md.	17.50	Aug. 24-Apr. 15	68	0.6	0.8
WGG	Radio Corporation of America	Tuckerton, No. 1, N. J.	18.85	do	80	.1	.2
WIL	do	New Brunswick, N. J.	22.04	Oct. 1-Apr. 15	64	.4	.8
WEO	do	Marion, Mass.	25.80	Aug. 21-Apr. 15	17	2.5	.8
WWJ	Detroit News	Detroit, Mich.	580	Aug. 27-Apr. 15	33	.2	.1
WCAP	Chesapeake & Potomac Telephone Co.	Washington, D. C.	640	Sept. 11-Apr. 15	45	.2	.1
WRC	Radio Corporation of America	do	640	Dec. 16-Apr. 15	26	.2	.1
WSB	Atlanta Journal	Atlanta, Ga.	700	Sept. 14-Apr. 15	47	.0	.1
WGY	General Electric Co.	Schenectady, N. Y.	790	June 28-Apr. 15	51	.1	.2
KDKA	Westinghouse Electric & Manufacturing Co.	East Pittsburgh, Pa.	920	Sept. 8-Apr. 15	90	.1	.1

RADIO SERVICE BULLETIN

15

ANNOUNCEMENT OF STANDARD RADIO-FREQUENCY TRANSMISSIONS

The Bureau of Standards is transmitting special signals of standard frequency about twice a month. The last previously announced schedule was published in the March, 1924, issue of the Radio Service Bulletin. The next schedule is announced below. The signals can be heard and utilized in general east of the Mississippi River.

These special signals of standard frequency are of use to testing laboratories, transmitting stations, operators, and others in standardizing wave meters and adjusting transmitting and receiving apparatus. The transmissions on May 20 and June 5 will be of special interest to ship operators, those on May 5 and July 7 to amateurs, and those on June 20 to broadcasting-station operators. The accuracy of these signals is better than three-tenths of 1 per cent. Information on how to use them was given in the February, 1923, issue of the Radio Service Bulletin. More detailed information is given in Bureau of Standards letter circular No. 92 which may be obtained on application from the Bureau of Standards, Washington, D. C.

All transmissions are by unmodulated continuous-wave telegraphy. A complete frequency transmission includes a "general call," a "standard frequency signal," and "announcements." The "general call" is given at the beginning of the eight-minute period and continues for about two minutes. This includes a statement of the frequency. The "standard frequency signal" is a series of very long dashes with the call letters WWV intervening. This signal continues for about four minutes. The "announcements" are on the same frequency as the "standard frequency signal" just transmitted, and contain a statement of the measured frequency. An announcement of the next frequency to be transmitted is then given. There is then a four-minute interval while the transmitting set is adjusted for the next frequency.

The schedule of standard frequency signals from the Bureau of Standards is as follows:

Schedule of frequencies in kilocycles

[Approximate wave lengths in meters in parentheses]

Eastern standard time	May 5	May 20	June 5	June 20	July 7
11.00 to 11.08 p. m.	1, 252 (220)	125 (2, 399)	300 (1, 000)	550 (545)	1, 252 (220)
11.12 to 11.20 p. m.	1, 430 (210)	153 (2, 264)	315 (952)	650 (461)	1, 430 (210)
11.24 to 11.32 p. m.	1, 500 (200)	143 (2, 097)	345 (869)	730 (400)	1, 500 (200)
11.36 to 11.44 p. m.	1, 600 (187)	155 (1, 934)	375 (800)	835 (360)	1, 600 (187)
11.48 to 11.56 p. m.	1, 700 (170)	166.5 (1, 800)	425 (705)	940 (316)	1, 700 (170)
12.00 to 12.08 a. m.	1, 800 (167)	205 (1, 463)	500 (600)	1, 050 (285)	1, 800 (167)
12.12 to 12.20 a. m.	1, 900 (158)	200 (1, 153)	600 (500)	1, 150 (231)	1, 900 (158)
12.24 to 12.32 a. m.	2, 000 (150)	315 (952)	667 (450)	1, 250 (240)	2, 000 (150)

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.

R000.—Radio communication

R100.—Radio principles

- R114 Tranter. Observations radioélectriques recueillies au cours d'une campagne dans le Pacifique (Octobre 1922-Juillet 1923). *L'Onde Electrique*, 3, pp. 70-82, February, 1924.
- R114 Todd, D. Heavy static predicted this year. *Wireless Age*, 11, pp. 21-23, April, 1924.
- R120 Jolliffe, H. Timely notes on aerial installations. *Radio News*, 5, p. 1583, May, 1924.
- R124 Batcher, R. Design of loop antennas. Part III. *Wireless Age*, 11, p. 54, April, 1924.
- R125.1 See, J. A. Direction finding: The development of the Bellini-Tosi system in the Mercantile Marine. *Electrician (London)*, 92, p. 320, March 14, 1924.
- R125.1 Keen, R. An experimental direction finding station. *Wireless World and Radio Review*, 14, pp. 9-13, April 2; pp. 45-48, April 9, 1924.
- R125.6 Respected, Lloyd. Balanced antenna system. U. S. Patent No. 1490165, issued April 15, 1924.
- R125.6 Bedess, F. L'antenne ondulatoire au antenne Beverage. *L'Onde Electrique*, 3, pp. 80-86, February, 1924.
- R123 Jones, E. T. Valve generated oscillations in coupled circuits. *Philosophical Magazine*, 47, pp. 625-647, April, 1924.
- R134.4 Harper, W. W. Should regeneration be eliminated? *QST*, 7, pp. 35-38, April, 1924.
- R134.45 Felder, L. R. The superregenerative circuit. *Radio (San Francisco)*, 6, pp. 29-30, April, 1924.
- R134.75 Sargent, E. M. The "divver" superheterodyne. *Radio (San Francisco)*, 6, pp. 13-14, April, 1924.
- R134.75 Ringel, A. The superheterodyne (Armstrong's address before the Institute of Radio Engineers). *Wireless Age*, 11, pp. 30-33, April, 1924.
- R134.8 Qard, F. A single-tube reflex receiver. *Radio (San Francisco)*, 6, pp. 17-18, April, 1924.
- R134.8 Using honeycombs in the knock-out reflex. *Radio Broadcast*, 5, pp. 33-38, May, 1924.
- R138 Davison, C. A note on the thermodynamic of thermionic emission. *Philosophical Magazine*, 47, pp. 544-549, March, 1924.
- R141 Strock, M. S. Possibilities of unique receiving circuits. *Radio News*, 5, pp. 1586-1588, May, 1924.

R200.—Radio measurements and standardization

- R204.2 Nolte, H. J. Seeing what your tubes are doing (simple method of measuring the plate dissipation, the output of power tubes also the resistance of the antenna). *QST*, 7, pp. 33-34, April, 1924.
- R261 Keyes, J. J. Method of making insulating material. U. S. Patent No. 1488304, issued April 1, 1924.
- R261 Brain, K. R. Investigation of piezo-electric effects with dielectrics (ebonite, glass, etc.). *Physical Society of London*, 36, pp. 61-63, February 16, 1924.
- R261.35 Dickson, A. A. C. Mica and micaite insulation. *Electrical Review (London)*, 94, pp. 408-409, March 14; pp. 469-470, March 21, 1924.

R300.—Radio apparatus and equipment

- R320.5- Kruse, S. Your antenna tower—a real problem. *QST*, 7, pp. 29-31, April, 1924.
- R330 Morecroft, J. H. The vacuum tube and how it works. *Radio News*, 5, pp. 1582-1584, May, 1924.
- R330 Cowper, A. D. The new low-flament current valves. *Modern Wireless (London)*, 2, pp. 103-104, January, 1924.
- R330 Miles of standard cable (data from book "Radio tube data book" by E. T. Cunningham). *Radio (San Francisco)*, 6, pp. 33-34, April, 1924.
- R330 The newest dull-emitters (The M. O., DE3, ARO6, B. T. H., B5, and DFORA. *Amateur Wireless and Electric (London)*, 4, p. 468, April 12, 1924.
- R331 Pickard, G. W. Vacuum electrical apparatus. U. S. Patent No. 1489613, issued April 1, 1924.
- R333 Barrell, W. S. The three-electrode valve. *Wireless World and Radio Review*, 13, pp. 765-767, March 19; pp. 797-799, March 26, 1924.
- R333 Blanchard, Lieutenant. Au sujet du rendement optimum des émetteurs à triodes. *L'Onde Electrique*, 3, pp. 83-85, February, 1924.
- R341 Breisch, E. W. Battery charging with rectigon rectifiers. *Electric Journal*, 21, pp. 155-159, April, 1924.
- R342.15 Pupin, M. I. Selective amplifying apparatus. U. S. Patent No. 1488514, issued April 1, 1924.
- R342.3 Allen, G. Y. How to build a resistance-coupled amplifier. *Radio Broadcast*, 5, pp. 39-42, May, 1924.
- R342.6 Sleeper, M. B. Something new in radio-frequency amplifiers. *QST*, 7, pp. 8-11, April, 1924.
- R342.6 Lewis, G. How to get the maximum radio-frequency amplification. *Popular Radio*, 5, pp. 442-448, May, 1924.
- R342.6 Hazeltine, L. A. Method and means for neutralizing capacity coupling of audions. U. S. Patent No. 1489228, issued April 1, 1924.
- R342.7 Cockaday, L. M. How to make an audio-frequency amplifier. *Popular Radio*, 5, pp. 476-485, May, 1924.
- R343 100 best book-ups No. 8. *Popular Radio*, 5, pp. 463-467, May, 1924.
- R343 Schaffer, W. Arrangement for the audible receiving of undamped oscillations. U. S. Patent No. 1489158, issued April 1, 1924.
- R343 Taylor, A. H. Receiver of high frequency electrical signals. U. S. Patent No. 1489237, issued April 8, 1924.
- R344.3 Goldberg, M. G. Loose-coupled transmitting circuits. *QST*, 7, pp. 11-14, April, 1924.
- R344.3 Parkes, A. W. Radio transmitting circuits (finding out what you are using). *QST*, 7, pp. 26-28, April, 1924.
- R344 Pratt, E. J. Repeater circuits. U. S. Patent No. 1490679 issued April 15, 1924.
- R370 Cary, W. H. Home remedies for indisposed receivers. *Radio Broadcast*, 5, pp. 3-6, May, 1924.
- R374 A batch of crystals (tests on Melitta, Celconite, electronic, national and tungstallite). *Wireless Trader Supplement (London)*, 2, pp. 50-51, April, 1924.
- R376 MacGregor-Morris, J. T. How to test telephone receivers. *Popular Radio*, 5, pp. 454-455, May, 1924.
- R376.3 Rankine, A. O., and others. General principles involved in the accurate reproduction of sound by means of a loud-speaker (with discussions). *Physical Society of London*, 36, pp. 115-151, February 15, 1924.
- R376.3 Discussion on "Loud-speakers for wireless and other purpose." *Journal Institution of Electrical Engineers (London)*, 62, pp. 235-238, March, 1924.
- R377 Campbell-Swinton, A. A. The possibilities of television with wire and wireless. *Wireless World and Radio Review*, 14, pp. 51-56, April 9, 1924.

RADIO SERVICE BULLETIN

17

- R377 Langer, N. Radio television: The Mihaly telehor machine. *Radio News*, 5, pp. 1570-1571, May, 1924.
- R384.1 Kruse, S. Amateur wavemeters. Part II. *QST*, 7, pp. 20-22, April, 1924.
- R385.5 Sandeman, E. K. The electrostatic transmitter (condenser transmitter). *Wireless World and Radio Review*, 18, pp. 785-789, March 26, 1924.
- R387.1 Barbold, R. H. Some experiments on the screening of radio receiving apparatus. *Journal Institution of Electrical Engineers (London)*, 62, pp. 249-264, March, 1924.

R400.—Radio communication systems

- R400 Crawley, C. Wireless, lines and cables. *Modern Wireless (London)*, 2, pp. 238-242, January, 1924.
- R402 Mesny, R. The production and use of ultra short wave lengths (2 meters) Part 1. *Radio News*, 5, pp. 1566-1567, May, 1924.
- R402 Mesny, R. Les ondes très courtes: Les ondes de 46 mètres. *L'Onde Electrique*, 5, pp. 99-110, February, 1924.
- R414 Gabriel, J. C. Wave modulating. U. S. Patent No. 1688489, issued April 1, 1924. *
- R422.1 Brackett, Q. A. System of control. U. S. Patent No. 1490198, issued April 15, 1924.
- R430 Hammond, J. H., Jr. Radiodynamic system and method for avoiding wave interference. U. S. Patent No. 1493081, issued April 1, 1924.
- R430 Van Dyck, A. F. Man-made static. *Radio Broadcast*, 5, pp. 43-46, May, 1924.
- R430 Snyder, J. A study of the frequency trap (wave trap). *Radio (San Francisco)*, 6, pp. 25-26, April, 1924.
- R431 Bailey, A. Getting static's autograph. *Popular Radio*, 5, pp. 450-453, May, 1924.
- R431 Powers, W. P. Whistling interference. *Radio News*, 5, pp. 1580-1581, May, 1924.
- R470 Rottgardt, K. Wired radio experiments for amateurs. *Radio News*, 5, p. 1589, May, 1924.

R500.—Applications of radio

- R512 Dunmore, F. W. Radio beacons nondirective and directive. *Radio News*, 5, pp. 1554-1556, May, 1924.
- R515 Huli, A. W. Sound detecting device. U. S. Patent No. 1490742, issued April 15, 1924.
- R520 Marty, P. La T. S. F. et la navigation aerienn: Le service arien Paris-Bucarest. *Radiodiffusion*, 5, pp. 154-157, March 25, 1924.
- R521.1 Frauck, Comm. Mesures radiogoniométriques en avion. *L'Onde Electrique*, 5, pp. 65-66, February, 1924.
- R586 Wireless communication in mines (experiments conducted by the Bureau of Mines). *Telegraph and Telephone Age*, 42, pp. 151-152, April 1, 1924.
- R550 Barrett, W. E. The story of KFKX (broadcasting station in Hastings, Nebr.). *Radio Bug (Canada)*, 1, pp. 17-18, April, 1924.
- R580 Wireless for police work (Scotland Yard, England). *Electrician (London)*, 97, pp. 318-319, March 14, 1924.
- R580 Dellinger, J. H. Radiant future for radio forecast. *Manufacturer's News*, 25, pp. 5-6, April 12, 1924.
- R580 Pew, M. E. What is radio doing to our newspapers? *Popular Radio*, 5, pp. 428-429, May, 1924.
- R584 Northrup, E. F. Melting metals by radio (high-frequency furnace). *Popular Radio*, 5, pp. 430-437, May, 1924.
- R590 The new high-powered station of Buenos Aires. *Radio News*, 5, p. 1564, May, 1924.

R700.—Radio manufacturing

- R700.5 Declares against radio monopoly. *Telephony*, 86, pp. 14-15, April 5, 1924.
- R710 Sleeper, M. B. What are the opportunities in radio factories? *Wireless Age*, 11, pp. 62-66, April, 1924.
- R740 L'vor, J. E. A resale policy on radio (conflict between radio dealers and large industrial buyers has been met). *Electrical World*, 88, p. 503, March 8, 1924.

R500.—Nonradio subjects

- 847.7 Brady, J. B. The vacuum tube patent situation. *Radio News*, 5, p. 1573, May, 1924.
- 621.313.73 Sweeney, C. P. Phase multipliers and mercury arc rectifiers. *QST*, 7, pp. 16-19, April, 1924.
- 621.354.3 Mason, H. F. Build your own battery charger. *QST*, 7, pp. 46-48, April, 1924.

ADDITIONAL COPIES

OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.

AT

5 CENTS PER COPY

SUBSCRIPTION PRICE, 25 CENTS PER YEAR



[Return to Radio Service Bulletins Index](#)