

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION

Washington, October 1, 1923—No. 78

CONTENTS.

	Page.		Page.
Abbreviations.....	1	Miscellaneous—Continued.....	
New stations.....	2	Alteration in time signals of Mogdishu.....	9
Alterations and corrections.....	4	Daily weather bulletins transmitted by radio from the United States to France.....	9
Miscellaneous:		Standard frequency signals.....	10
Information from the Hydrographic Office.....	9	Bureau of Standards measurements of radio transmitting station frequencies.....	11
New radio fog signals established.....	8	References to current radio periodical literature.....	12
Alaskan stations closed until next season.....	8		
New station opened at Beyrout, Syria.....	8		
Instructions regarding applications for radio station licenses.....	8		

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 italica.
- Service** = Nature of service maintained:
 PG=General public.
 PR=Limited public.
 RC=Radio compass station.
 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.

NEW 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 Bureau.]

Name of vessel.	Call signal.	Rates.	Service.	Hours.	Owner of vessel.	Station controlled by—
Agwipond.....	KFKP		PG	X	Guaranty Trust Co....	R. C. A.
City of Birmingham.....	KFKC	8	PG	N	Ocean S. S. Co. of Savannah (Ga.).	
Emory L. Ford.....	KFKL		PG	X	Franklin S. S. Co.....	I. W. T. Co.
Fred G. Hartwell.....	KFKJ		PG	X	do.....	
Mars ¹	KFKD	8	PG	X	Diamond Transportation Co.	

¹ Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 450, 600, 706.

Commercial land and ship stations, alphabetically by call signals.

[h—ship station; c—land station.]

Call signal.	Name.	Call signal.	Name.
KFKC	City of Birmingham.....	KFKL	Emory L. Ford.....
KFKD	Mars.....	KFKP	Agwipond.....
KFKJ	Fred G. Hartwell.....		

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.
Boston, Mass. (portable).....	WTAT	Greentown, Ind.....	WJAK
Cambridge, Ill.....	WTAP	Hastings, Nebr.....	KFKX
Carthage, Ill.....	WCAZ	Kearney, Nebr.....	KFJU
Cedar Falls, Iowa.....	KFJX	Mattoon, Ill.....	WTAN
Cleveland, Ohio.....	WTAM	Millford, Kans.....	KFKB
Dexter, Iowa.....	KFJV	Norfolk, Va.....	WTAR
Fort Dodge, Iowa.....	KFJY	Osseo, Wis.....	WTAQ
Fort Worth, Tex.....	KFJZ	Towanda, Kans.....	KFIW

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.	Station operated and controlled by—	Location of station.	Power (watts)	Wave length.	Frequency (kilo-cycles).
KJFU	Central Power Co.....	Kearney, Nebr.....	10	294	1,280
KFJV	Thomas H. Warren.....	Dexter, Iowa.....	10	294	1,340
KFJW	Le Grand Radio Co.....	Towanda, Kans.....	10	296	1,330
KFJX	Iowa State Teachers' College.....	Cedar Falls, Iowa.....	50	220	1,310
KFJY	Tunwall Radio Co.....	Fort Dodge, Iowa.....	50	246	1,220
KFJZ	Texas National Guard, One hundred and twelfth Cavalry.....	Fort Worth, Tex.....	20	254	1,180
KFKB	Brinkley-Jones Hospital Association.....	Millford, Kans.....	500	296	1,060
KFKX	Westinghouse Electric & Manufacturing Co.....	Hastings, Nebr.....	500	296	1,060
WCAZ	Carthage College.....	Carthage, Ill.....	50	246	1,220
WJAK	Clifford L. White.....	Greentown, Ind.....	30	264	1,180
WTAM	Willard Storage Battery Co.....	Cleveland, Ohio.....	1,000	300	770
WTAN	Orndorff Radio Shop.....	Mattoon, Ill.....	100	240	1,260
WTAP	Cambridge Radio & Electric Co.....	Cambridge, Ill.....	50	242	1,240
WTAQ	S. H. Van Gordon & Son.....	Osseo, Wis.....	100	226	1,330
WTAR	Reliance Electric Co.....	Norfolk, Va.....	70	226	1,330
WTAT	Edison Electric Illuminating Co.....	Boston, Mass. (portable).....	100	244	1,290

Government land stations, alphabetically by name 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—
Brownsville, Tex. J.	NAY	600, 953, #250, 2400, 3047, 5000.	PG	N	U. S. Navy.

¹ Loc. J (approximately) 0.97° 29' 00", N. 25° 22' 00"; range, 300-600; system, U. S. Navy arc and spark, 1000; rates, ship service 12 cents per word. The time signals and weather reports heretofore transmitted by Point Isabel will be transmitted by Brownsville on the same wave length at noon, 3 and 7 p. m., and midnight.

Government airplane 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—
ZR-1.....	NERK	O	N	U. S. Navy.
ZR-3.....	NERM	O	N	Do.

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—
Ann Arbor, Mich.	8ZK	Elmer W. Reeve, 1001 West Washington Street.
Atlanta, Ga.	4ZA	Harry F. Dobbs, 427 Peachtree Street.
Berkeley, Calif.	6ZAD	Donald E. Koch, 2043 Berryman Street.
Boise, Idaho.	7XT	Boise High School.
Buffalo, N. Y.	8XN	Federal Telephones & Telegraph Co., 1738 Elmwood Street.
Chicago, Ill.	9XAV	City of Chicago.
Cleveland, Ohio.	8XBD	Radiovox Co., 5005 Euclid Avenue.
Do.	8XG	Willard Storage Battery Co., 12651 Taft Avenue.
Do.	8YAJ	Young Men's Christian Association.
Do.	8ZI	Henry Grossman, 12343 Forest Grove Avenue.
East Braintree, Mass.	1ZF	Harry Hanson, 85 Quincey Avenue.
East Lansing, Mich.	8ZL	F. I. Phippeny, 1354 West Grand River Avenue.
Everett, Wash.	7ZC	Glenn Gouda, 2818 Victor Place.
Frackville, Pa.	8XDA	Pennsylvania Power & Light Co.
Galveston, Tex.	5ZG	H. C. Sherrod, jr., 1627 Avenue I.
Hastings, Nebr.	9XW	Westinghouse Electric & Manufacturing Co.
Haute, Pa.	8XBB	Pennsylvania Power & Light Co.
Hasleton, Pa.	8XBC	Do.
Hubbard, Ohio.	8ZJ	Alvin L. Anderson, 17 East Liberty Street.
New Orleans, La.	3ZI	Louis J. N. Du Treil, 480 Audubon Street.
Oakland, Calif.	6XBL	Bernard H. Linden, 2626 Eleventh Avenue.
Do.	8ZAK	Daniel L. O'Brien, 643 Polzer Street.
Do.	6ZG	Bernard H. Linden, 2626 Eleventh Avenue.
Do.	6ZX	Percy W. Dann, 503 Thirty-fifth Street.
Piedmont, Calif.	6ZV	Gerald M. Best, 109 Greenbank Avenue.
Redwood City, Calif.	6ZAN	Charles V. Litton, Eaton Avenue.
Riverside, Calif.	6ZP	Lloyd E. West, 342 Main Street.
San Jose, Calif.	6ZAJ	Harry Engwicht, 405 North Third Street.
San Juan, P. R.	4ZH	Enrique Camunas, Stop 43 Pershing Avenue.
Schenectady, N. Y.	2XAB	Charles N. Nebel, 1234 State Street.
Seattle, Wash.	7XAA	Amateur Radio Club of Seattle (Robert Waskey), 1213 Twenty-eighth Avenue NW.
Do.	7ZG	Robert Waskey, 7213 Twenty-eighth Avenue NW.
Do.	7ZS	Vincent I. Kraft, 6838 Nineteenth Avenue NE.
Selma, Calif.	6ZK	H. R. Shaw.
Southbridge, Mass.	1ZD	John M. Wells, 40 Main Street.
Syracuse, N. Y.	8XBE	Alfred R. Marcy, 113 West Raynor Avenue.

Special land stations, grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
1ZD	First district:	7XAA	Seventh district:
1ZF	Southbridge, Mass.	7XT	Seattle, Wash.
2XAB	East Braintree, Mass.	7ZC	Boise, Idaho.
4ZA	Second district: Schenectady, N. Y.	7ZG	Everett, Wash.
4ZH	Fourth district:	7ZS	Seattle, Wash.
5ZG	Atlanta, Ga.	8XBA	Do.
5ZI	San Juan, P. R.	8XBB	Eighth district:
6XB1	Fifth district:	8XBC	Frackville, Pa.
6ZAD	Galveston, Tex.	8XBD	Hauto, Pa.
6ZAJ	New Orleans, La.	8XBE	Hastoton, Pa.
6ZAK	Sixth district:	8XG	Cleveland, Ohio.
6ZG	Oakland, Calif.	8XN	Syracuse, N. Y.
6ZK	Berkeley, Calif.	8YAJ	Cleveland, Ohio.
6ZAN	San Jose, Calif.	8ZI	Do.
6ZP	Oakland, Calif.	8ZJ	Hubbard, Ohio.
6ZV	Do.	8ZK	Ann Arbor, Mich.
6ZX	Seima, Calif.	8ZL	East Lansing, Mich.
	Bedwood City, Calif.	9XAV	Ninth district:
	Riverside, Calif.	9XW	Chicago, Ill.
	Piedmont, Calif.		Hastings, Nebr.
	Oakland, Calif.		

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 Bureau.

BURRWOOD, LA.—W. I., 300, 600, 1,713; rates, limited public service with New Orleans, 10 cents per word.

CHATHAM, MASS. (WIM).—W. I., 300, 600, 706.

HONOLULU, HAWAII.—Loc. $0.157^{\circ} 50' 36''$, N. $21^{\circ} 18' 12''$; service, FX.

LOS ANGELES, CALIF. (KPK).—W. I., 143.

NEGLEY, OHIO.—W. I., 1,689.

NEW LONDON, CONN.—Strike out all particulars.

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 Bureau.]

AGWIHAVRE.—W. I., add 706.

AMERICAN LEGION.—W. I., add 706.

ANNISTON CITY.—W. I., add 706.

ASTRAL.—W. I., add 706.

BAYPORT.—United States Shipping Board owner of vessel.

BEARPORT.—Station operated and controlled by I. W. T. Co. (U. S. L.).

BIDWELL.—Sun Shipbuilding & Dry Dock Co. owner of vessel.

BRUSH.—Station operated and controlled by I. W. T. Co.

CADARETTA.—Charles W. Cook owner of vessel.

CASPER.—W. I., add 706.

CITY OF CHATTANOOGA.—Rates, 8 cents per word; station operated and controlled by R. C. A.

CITY OF CLEVELAND III.—W. I., add 706.

CLARE.—W. I., add 706.

COLIN H. LIVINGSTONE.—W. I., add 706.

CONCHO.—System, R. C. A., 1000. W. I., add 450.

CUBORE.—System, R. C. A., 1000.

CULBURRA.—Pacific Motorship Co. owner of vessel.

DELOSA.—Alaska S. S. Co. owner of vessel.

DEWEY.—Station operated and controlled by I. W. T. Co. (U. S. L.).

DIANA DOLLAR.—W. I., add 706.

DILWORTH.—W. I., add 1800.

DOCHET.—W. I., add 706.

- DOYLESTOWN.—Station operated and controlled by R. C. A.
 ELKHORN.—System, Navy-Kilbourne & Clark, 1000; w. l., add 706.
 ELKTON.—W. l., add 706.
 FRANKLIN K. LANE.—W. l., 300, 450, 600, 706.
 FREDERIC R. KELLOGG.—W. l., add 706.
 GASTON.—W. l., 300, 450, 600, 706.
 GLENPOOL.—W. l., add 706.
 GLYMONT.—Charles W. Cook owner of vessel.
 G. N. WILSON.—Station operated and controlled by owner of vessel.
 HANLEY.—W. l., add 706.
 HANOVER.—W. l., add 706.
 HEGIRA.—W. l., add 450.
 HELEN.—W. l., add 450.
 HERMAN FRASCH.—W. l., add 706.
 HOXBAR.—W. l., 300, 450, 600, 706.
 I. J. MERRITT.—Rates, 6 cents per word; Merritt & Chapman and Scott Corp. owner of vessel.
 INNOKO.—W. l., add 706.
 JACOX.—Station operated and controlled by R. C. A.
 JAMESTOWN.—W. l., add 706.
 JOHN C. KIRKPATRICK.—Rates, 8 cents per word; station operated and controlled by R. C. A.
 JOMAR.—W. l., 300, 600.
 JUVIGNY.—W. l., 300, 450, 600, 706.
 KERHONKSON.—W. l., add 706.
 KNOXVILLE CITY.—W. l., add 706.
 LAKE FILBERT.—Name changed to Nabesna.
 LAKE GITANO.—System, R. C. A., 1000.
 LASSEN.—Range, 200; system, Gray & Danielson, 1000; w. l., 300, 600, 706; station operated and controlled by owner of vessel.
 LEHIGH.—W. l., add 706.
 LIBERTY GLO.—W. l., add 706.
 LOUIS R. DAVIDSON.—Rates, Great Lakes service 2 cents per word; station operated and controlled by owner of vessel.
 LURLINE.—W. l., add 706.
 MARTINIQUE.—W. l., add 706.
 MARY WINKELMAN.—Range, 300; system, R. C. A., 1000; w. l., 300, 600, 706.
 MELVILLE DOLLAR.—W. l., add 706.
 MONTEREY.—System, R. C. A., 1000; w. l., add 706.
 MUNISLA.—W. l., add 706.
 MUNPLACE.—Munplace S. S. Corp. owner of vessel.
 NEW BRITAIN.—W. l., add 706.
 NOBLES.—System, Navy-Wireless Specialty Apparatus Co., 1000.
 NORTHERN STAR.—Name changed to Defacto.
 ORIZABA.—W. l., add 706.
 OSAGE.—W. l., 300, 600, 706.
 PACHET.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 450, 600; station operated and controlled by I. W. T. Co.
 PRESIDENT HARRISON.—W. l., add 706.
 PRESIDENT JACKSON.—System, Federal arc and Navy-Wireless Specialty Apparatus Co., 1000.
 PRUSA.—Station operated and controlled by I. W. T. Co. (U. S. L.).
 REPUBLIC (KUBJ).—System, Navy-Simon, 1000; w. l., 300, 600.
 RESTORER.—W. l., add 706.
 RIFFLE (KDUN).—W. l., add 706; station operated and controlled by R. C. A.
 RUTH.—W. l., add 706.
 SAN RAMON.—Name changed to Katherine Donovan; New Orleans Coal & Bisso Towboat Co., owner of vessel.
 SANTA OLIVIA.—W. l., add 706.
 SANTA TECLA.—System, R. C. A., 1000; w. l., 300, 450, 600, 706.
 SARCOXIE.—W. l., add 706.
 SATARTIA.—W. l., add 706.
 SCHOODIC.—W. l., add 706.
 SIDNEY M. HAUPTMAN.—W. l., add 706.
 STANLEY.—W. l., add 706.
 STUART DOLLAR.—W. l., add 706.
 SUDAWSONCO.—Rates, 8 cents per word; station operated and controlled by R. C. A.

- SUDURCO.—W. I., add 706.
 SUGLLENCO.—Range, 300; system, Navy-Wireless Improvement Co., 1000; w. l., 300, 450, 600, 706; rates, 8 cents per word; station operated and controlled by R. C. A.
 SUNELSECO.—W. I., add 706.
 SUGARESCO.—W. I., add 706.
 SUJERSEYCO.—Rates, 8 cents per word; station operated and controlled by R. C. A.
 SUNUGENTCO.—Range, 300; system, Navy-Wireless Improvement Co., 1000; w. l., 300, 450, 600, 706.
 SUTERMCO.—W. I., add 706.
 SUWARINCO.—Rates, 8 cents per word; station operated and controlled by R. C. A.
 SWIFT ARROW.—Station operated and controlled by I. W. T. Co.
 TAMARACK IV.—W. I., 146, 300, 600; service, PR, communicates with stations in emergency; rates, none.
 TEXAN.—W. I., 300, 450, 600, 706.
 THOMAS CROWLEY.—Station operated and controlled by R. C. A.
 WANDERER.—System, composite, v. t. telephone and telegraph; w. l., 146, 300, 600.
 WARWICK.—W. I., add 706.
 WEST CHEROW.—W. I., add 706.
 WESTERN WORLD.—W. I., add 706.
 WEST HEMATITE.—Station operated and controlled by I. W. T. Co. (U. S. L.).
 WEST IVAN.—W. I., 300, 450, 600, 706.
 WEST KATAN.—W. I., add 706.
 WESTLAND (KJX).—System, Navy-R. C. A., 1000; w. l., add 706.
 WEST LOQUASSUCK.—Station operated and controlled by S. O. R. S. (U. S. L.).
 WEST MODUS.—Station operated and controlled by I. W. T. Co.
 WEST NOTUS.—Range 300; system Federal arc; w. l., 300, 600, 1800.
 WEST QUECHEE.—W. I., 300, 450, 600; hours, X.
 WHEATON.—Hours, N.
 WHITE CAP.—Range, 300; system, R. C. A., 1000; w. l., 300, 600, 706.
 WILLIAM H. DOHENY.—W. I., add 706.
 WILLIAM T. ROBERTS.—Station operated and controlled by owner of vessel.
 Strike out all particulars of the following-named vessels: Cuba (WQU) and Hyannis.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

- KOKC, read Defacto; KONV, read Nabesna; WNW, read Katherine Donovan; strike out all particulars following the call signals, KING, WLC, and WQU.

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.]

- KDZQ (Denver, Colo.).—Station operated and controlled by Nichols Academy of Dancing (Hal G. Nichols).
 KFAV (Venice, Calif.).—W. I., 224; frequency, kc. 1340.
 KFBS (Trinidad, Colo.).—Power, 15.
 KFEZ (St. Louis, Mo.).—Power, 100.
 KFGJ (St. Louis, Mo.).—Power, 250.
 KFIL (Louisburg, Kans.).—Power, 30.
 KFZ (Spokane, Wash.).—Station operated and controlled by Doerr-Mitchell Electric Co. & Pacific Telegraph Institute.
 WABM (Saginaw, Mich.).—Station operated and controlled by F. E. Doherty Automotive & Radio Equipment Co.
 WABN (La Crosse, Wis.).—Power, 250; w. l., 244, frequency, kc. 1230.
 WCAD (Canton, N. Y.).—Power, 250.
 WCAR (San Antonio, Tex.).—Power, 150.
 WCAT (Rapid City, S. Dak.).—Power, 50
 WDT (Stapleton, N. Y.).—Changed to New York, N. Y.
 WEAA (Flint, Mich.).—Station operated and controlled by Frank D. Fallain, Police Building.
 WEAN (Providence, R. I.).—Power, 100; w. l. 273, frequency, kc. 1100.
 WHAH (Joplin, Mo.).—Power, 250.
 WHAK (Clarksburg, W. Va.).—W. I., 258, frequency, kc. 1160.
 WHAP (Decatur, Ill.).—Power, 50.
 WIAJ (Neeenah, Wis.).—Power, 100.
 WIK (McKeesport, Pa.).—Power, 500; w. l., 234, frequency, kc. 1280.

WJAG (Norfolk, Nebr.).—Power, 200.
 WKAA (Cedar Rapids, Iowa).—W. l., 268, frequency, kc. 1120.
 WKAN (Montgomery, Ala.).—Power, 15.
 WLAJ (Waco, Tex.).—Power, 150.
 WMAN (Columbus, Ohio).—Power, 10.
 WMAP (Easton, Pa.).—Power, 50.
 WNAR (Butler, Mo.).—W l., 231, frequency, kc 1300.
 WOAG (Belvidere, Ill.).—Power, 100.
 WOAL (Webster Groves, Mo.).—W. l., 229, frequency, kc. 1310.
 WOAV (Erie, Pa.).—Power, 100.
 WPAJ (New Haven, Conn.).—Power, 10.
 WQAE (Springfield, Vt.).—Power, 50.
 WQAL (Mattoon, Ill.).—Power, 10.
 WRAH (Providence, R. I.).—W. l., 231, frequency, kc. 1300.
 WRAO (St. Louis, Mo.).—Power, 100.
 WTAL (Toledo, Ohio).—Power, 10; w. l., 252, frequency, kc. 1190.
 Strike out all particulars of the following-named stations: KFAQ, San Jose, Calif.; KFDC, Spokane, Wash.; KFHL, Oskaloosa, Iowa; KFHP, Kearney, Nebr.; KFZ, Spokane, Wash.; KMC, Reedley, Calif.; WBAU, Hamilton, Ohio; WDAJ, College Park, Ga.; WHAY, Huntington, Ind.; WKAC, Lincoln, Nebr.; WLAZ, Warren, Ohio; WMAT, Duluth, Minn.; WRAB, Savannah, Ga.; and WTAK, Steubenville, Ohio.

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.]

COLUMBIA RIVER LIGHT VESSEL.—Loc. $0.124^{\circ} 10' 35''$, N. $46^{\circ} 10' 45''$.
 EAGLE HARBOR, MICH.—Issue No. 78 of this publication, page 67, should be corrected to have the call signal read NUG.
 GRAND MARIAS.—Correct orthography Grand Marias.
 NANTUCKET SHOALS LIGHT VESSEL.—Loc. $0.69^{\circ} 37' 06''$, N. $40^{\circ} 37' 02''$.
 POINT ISABEL, TEX.—Strike out all particulars.
 ST. CROIX, V. I.—Loc. $0.64^{\circ} 42' 16''$, N. $17^{\circ} 45' 09''$.
 SURFSIDE, MASS.—Read Surfside, Mass. (Nantucket Island).
 TATOOSH, WASH.—Service, O.
 WASHINGTON, D. C. (NKF).—Read Washington, D. C. (Bellevue).

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.]

MORRILL.—Rates, Great Lakes service 2 cents per word.
 TUSCARORA.—Rates, Great Lakes service, 2 cents per word.
 Strike out all particulars of the following-named vessels: Cardinal, New Jersey, and Virginia.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NBS, read Surfside, Mass. (Nantucket Island); NKF, read Washington, D. C. (Bellevue); NZT, read Grand Marias; strike out all particulars following the call signals, NAFN, NAY, NMF, and NVR.

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.]

BUENA VISTA, VA. (SZAA).—Call signal changed to 3ZA; station operated and controlled by J. Frank Key.
 FULLERTON, CALIF. (6XAN).—Changed to San Fernando, Calif., 452 Chetsworth Drive.
 GLENBROOK, CONN. (1XAK).—Station operated and controlled by Stamford Radio & Electric Co.
 OAKLAND, CALIF. (6XA).—Address, 1133 Kirkham Street.
 OKLAHOMA, OKLA. (5XG).—Address, 406 North Hudson Street.

PINE BLUFF, ARK. (5XAI).—Station operated and controlled by Arkansas Light & Power Co.

SEATTLE, WASH. (7XC).—Address 6838 Nineteenth Avenue NE.

SEATTLE, WASH. (7XR).—Address, 2020 Thirteenth Street NW.

Strike out all particulars of the following-named stations: Amston, Conn. (1XAI); Anthony, Kans. (9ZAC); Atlanta, Ga. (4XI); Bala, Pa. (3ZA); Beatty, Pa. (8YAG); Davenport, Iowa (9XE); Douglas, Mont. (7ZG); Ellendale, N. Dak. (9ZX); Helena, Mont. (7ZC); Honolulu, Hawaii (6XAP); Kansas City, Mo. (9XAB); Los Angeles, Calif. (6XAW); Los Angeles, Calif. (6XJ); Los Angeles, Calif. (6ZG); Norman, Okla. (5ZG); Noroton Heights, Conn. (1XAA); Omaha, Nebr. (9YP); Philadelphia, Pa. (3XAI); Provo, Utah (6YD); San Francisco, Calif. (6XAA); San Francisco, Calif. (6XG); St. Louis, Mo. (9ZB); St. Petersburg, Fla. (4ZH); Sunnyvale, Calif. (6XAG); Sunnyvale, Calif. (6ZK); University Place, Nebr. (9YD); and Walnut Grove, Calif. (6ZX).

MISCELLANEOUS.

INFORMATION FROM THE HYDROGRAPHIC OFFICE.

Radio time signal, Mogadiscio.—The radio time signals at Mogadiscio are now made at 5^h 56^m, 5^h 58^m, and 6^h G. M. T. (civil). The method of transmission remains unchanged. Approximate location, latitude 2° 02' N., longitude 45° 21' E.

Hydrographic information on Lower Great Lakes.—Dissemination of hydrographic and meteorological information on the lower lakes is now being handled by the commercial station WTK, located at Cleveland, Ohio. These bulletins are transmitted at 10.45 a. m. and 4.45 p. m. (seventy-fifth meridian time) on a wave length of 706 meters, spark. In addition to the broadcasting of these bulletins all messages addressed to "Government Hydro, Cleveland," will be received and transmitted.

NEW RADIO FOG SIGNALS ESTABLISHED.

Radio fog signals have been established on the Nantucket Shoals Light Vessel and the Columbia River Light Vessel. The signal of the first-named station consists of a series of 4 dashes for 30 seconds, silent 25 seconds, transmitted continuously during thick or foggy weather on a wave length of 1,000 meters (300 kilocycles, frequency). Location, approximately 0.69° 37' 06," N. 40° 37' 02." The signal for the Columbia River Station consists of a series of 3 dashes for 20 seconds, silent 20 seconds. Location, approximately 0.124° 10' 35", N. 46° 10' 45." Wave length, 1,000 meters.

ALASKAN STATIONS CLOSED UNTIL NEXT SEASON.

The following-named stations closed until next season on the dates set after their names: Chignik (KNP), September 1; Chisik Island (KUCP), September 20; False Pass (KJL), August 28; King Cove (KJK), August 23; Kussloff (KKAO), September 3; Pirate Cove (KOXN), September 17; Tenakee (KOSC), September 11.

NEW STATION OPENED AT BEIRUT, SYRIA.

According to information received by this office a new station was opened at Beirut, Syria, on August 20 last. The station is open to general public correspondence on 450, 600, and 800 meters from 6 to 10 a. m. and noon to 4 p. m. G. M. T. Range, 500 miles, rates 60 centimes (gold) per word, station operated by the "Radio-France."

INSTRUCTIONS REGARDING APPLICATIONS FOR RADIO STATION LICENSES.

Supervisors of radio of this department, radio companies, and others concerned are requested to be very careful in filling in applications for station licenses, especially in regard to the geographical location of land stations and the owners and home ports of ship stations. It is important that the correct geographical location be given, as in some instances the names of certain places where stations are located are not shown on maps. A large percentage of the applications for ship station licenses are corrected in this office due to the failure of radio companies not having the proper owner shown in the application. The owner given in the application should be the same as that given in the outstanding marine document (register, enrollment, or license, of the vessel. The home port is the port where the permanent marine document is issued.

ALTERATION IN TIME SIGNALS OF MOGDISHU.

[From Admiralty, London, September 12, 1923.]

Position.—Lat. $2^{\circ} 02' N.$, long. $45^{\circ} 21' E.$ (approximately). Africa, east coast. Italian Somaliland.

Details.—Wireless time signals are now transmitted daily by Mogdishu W/T station at $17^{\text{h}} 56^{\text{m}} 00^{\text{s}}$, $17^{\text{h}} 58^{\text{m}} 00^{\text{s}}$, and $18^{\text{h}} 00^{\text{m}} 00^{\text{s}}$, G. M. T. (astronomical), corresponding to $20^{\text{h}} 56^{\text{m}} 00^{\text{s}}$, $20^{\text{h}} 58^{\text{m}} 00^{\text{s}}$ and $21^{\text{h}} 00^{\text{m}} 00^{\text{s}}$ standard time, instead of at the times stated in the former notice. The procedure is as follows:

G. M. T. (astronomical).		Signal.
H. M. S.	H. M. S.	
17 52 00 to 17 53 48		ISG ISG ISG etc.
17 54 00 to 17 54 38		"Segnale orario" followed by sent four times.
17 55 00 to 17 55 51		— sent every 5 seconds.
17 56 00		. Time signal.
17 57 00 to 17 57 52		— . . . sent every 5 seconds.
17 58 00		. Time signal.
17 59 00 to 17 59 53		— sent every 5 seconds.
18 00 00		. Time signal.

DAILY WEATHER BULLETINS TRANSMITTED BY RADIO FROM THE UNITED STATES TO FRANCE.

The United States Weather Bureau sends each evening, Sundays and holidays included, to the French meteorological service, at Paris, a bulletin containing observations taken at a number of stations in the United States, Alaska, and Canada, the position at the same hour of dominating high and low pressure areas, and weather reports from a limited number of ships in the north Atlantic Ocean. All land observations are of hour 0100 G. M. T., and Alaskan reports of hour 2100 G. M. T., current date. The bulletin is addressed to "Angot, Paris," and is forwarded through the United States naval radio station at Annapolis (NSS) to the radio station at Lyons (YN). The transmissions are made on a wave length of 17,145 meters, continuous wave, as the first message in the Annapolis schedule with France. This schedule begins at 0530, G. M. T., and transmission commences as soon thereafter as communication with Lyons (YN) can be established.

The messages are coded in a modified form of the International Meteorological Code, except that a date word is used to show the day of the month and the period of the day (a. m. or p. m.), that the land observations were taken and key letters instead of numerals to designate such places. The date word immediately follows the address (for date words see p. 9, United States Weather Bureau Radiographic Code for Vessel Weather Observers).

The arrangement of the messages are in coded groups, as follows:

Land stations: Index letters, BBBDF.

Ship reports: Ship call letters, JQLLL, IHGG, BBBDF, TTC.

Center of predominating high and low: Name of station, BBBDF.

Meaning of symbols.

BBB=Pressure reduced to sea level, in inches (initial figure, 2 or 3 omitted).

D=Wind direction on scale 0 to 8, in which 0=calm, 1=N, 2=N E, 3=E, 4=S E, 5=S, 6=S W, 7=W, and 8=N W.

F=Wind force in Beaufort scale.

J=Day of week, numbered 1 to 7, beginning with Sunday.

Q=Quarter of globe in which ship is situated (always in north latitude, represented by figure 1, for ship reports included in Angot message).

LLL=Latitude in degrees and minutes. The actual minutes are determined by multiplying the third coded figure by six.

lll=Longitude in degrees and minutes. Minutes are determined in same manner as for latitude.

TT=Temperature in Fahrenheit to nearest even degree.

C=State of sky according to scale in which 1=clear (3 tenths clouds or less), 2=partly cloudy (4 to 7 tenths), 3=cloudy (8 to 10 tenths), 4=raining, 5=snowing, 6=thunderstorms, 7=sleeting, 8=dense fog.

Example of bulletin.

Following is an example of a bulletin:

(Address), Angot, Paris; (date word), Hoodoo; (St. Johns, Newfoundland), J 02652; (Sydney, Nova Scotia), S 01264; (Father Point, Canada), FP 98662; (Parry Sound, Canada), PN 00000; (White River, Canada), WR 99800; (Winnipeg, Canada), WI 99641; (La Pas, Canada), LP 97861; (Edmonton, Canada), ED 97081; (Nantucket), T 00062; (Washington), WA 00271; (Hatteras), H 00263; (Charleston), C 00471; (Bermuda), B 02852; (Key West), K 00231; (Little Rock, LR 00431; (Nashville), NV 01081; (Cleveland), V 00441; (Chicago), CH 00431; (Duluth), DU 99871; (Huron), HN 00051; (Salt Lake City), SLC 97683; (Helena), HL 98261; (Denver), DV 99211; (Roseburg), RO 98481; (Tatoosh Island), TAT 99453; (San Francisco), SF 99073; (San Diego), DI 98681; (Fort Worth), FW 99411; (El Paso), EP 98481; (Juneau, Alaska), JU 99651; (Tanana, Alaska), TN 98281; (Dutch Harbor, Alaska), DH 98200; KMI, 41389, 73819, 00021, 723; KDE, 41392, 74119, 98800, 703; ZTR, 41386, 74219, 00400, 723; KEGM, 41392, 74219, 00451, 703; (High), Bermuda, 02852; (Low), Father, 98662.

NOTE.—Words in parenthesis are not transmitted.

The following partial translation will serve to illustrate how the messages are decoded:

Hoodoo—29th day of the month, p. m. report.

J 02652.—J—St. Johns, N. S.; 02652—(026) sea level barometer pressure 30.26 inches; (5) winds from S; (2) wind force of 2 in Beaufort Scale.

KMI 41389, 73819, 00021, 723: KMI—steamship *Tivives*. 41389—(4) Wednesday, (1) north, (389) latitude $38^{\circ} 54'$; 73819—(738) longitude $73^{\circ} 48'$, (19) time of observation 1900 G. M. T.; 00021—(000) sea level barometer reading 30.00 inches; (2) wind direction, NE., (1) wind force 1 in Beaufort scale; 723—(72) temperature 72° F.; state of sky, cloudy.

Bermuda 02852: Bermuda—Bermuda Islands, the location of nearest reporting station to center of predominating high; 02852—(028) barometer reading 30.28 inches, center of high, (5) wind direction S.; (2) wind force of 2 in Beaufort scale.

Father 98662: Father—Father Point, Nova Scotia, the location of nearest reporting station to center of predominating low; 98662—(936) barometer reading nearest center of low, 29.86 inches, (6) wind direction SW., and (2) wind force of 2 in Beaufort scale.

Each evening during a period of more than 25 years the United States Weather Bureau has been furnishing the French meteorological service with a bulletin showing current weather from a few stations. The messages formerly were sent by cable. The address "Angot" was utilized because Dr. A. Angot was director of that service. The address was perpetuated in honor of that distinguished meteorologist, who retired several years ago. The bulletin in its present expanded form began in July, 1922, and was the result of arrangements made during a visit to the United States Weather Bureau by Capt. Philippe Wehrle, assistant director of the French meteorological service, and Prof. Marcel Coyocque, meteorologist of the French training ship *Jacques Cartier*. These arrangements provide for a daily exchange by radio of European and American meteorological reports and were made possible by the cooperation of the office of communication of the French and American Navy Departments.

The American reports are broadcast from the Eiffel Tower (FL) radio station for the benefit of other European meteorological services and ships in western European waters. The broadcasts from Eiffel Tower are the same in form in which the bulletins are transmitted from the United States and follows immediately after the regular European weather report bulletins, which are transmitted at 11.20 G. M. T., on 2,600 meters, spark, and, in case of a breakdown of the spark apparatus, on 6,300 meters, continuous wave.

Although the Angot bulletins are specially addressed to the French meteorological service, they are intended for the general benefit, and shipmasters are at liberty to pick them up during transmission from Annapolis to Lyons and to use the information contained therein.

The bulletins containing European reports that were sent by radio to the United States Weather Bureau in exchange have been interrupted for several months. Consequently, the time of their transmission and the wave length used is not available for publication herein. An announcement giving the details of this bulletin will be made as soon as the messages are resumed.

STANDARD FREQUENCY SIGNALS.

Notice has been issued by the Navy Department to the effect that on the third Monday of each month, beginning Monday, October 15, standard frequency signals

will be transmitted from station NPG, Mare Island Navy Yard, at San Francisco, Calif. These signals will be transmitted by the Navy Department and will be somewhat similar to those transmitted from the Bureau of Standards (station WWV). The entire transmission will be on continuous waves (arc transmitting set), and no voice announcements will be made.

The table below gives the complete schedule. The frequencies given in the table are only approximate and may be changed somewhat. During the transmission the frequency will be measured and the exact value will be announced during the three-minute period designated as "Announcements." The notice states that the measured frequencies will probably be correct within two-tenths of 1 per cent. Suitable methods for using these signals for wave-meter calibration were given in the February (1923) issue of this bulletin.

Schedule of standard frequency signals from NPG.

Standard Pacific coast time. ¹	Signal.	Approximate frequency.
<i>Medium power (Arc).</i>		
8 to 8.04 a. m.	General call, QST de NPG.....	* 64.5 (4650)
8.04 to 8.08 a. m.	Standard frequency.....	
8.08 to 8.11 a. m.	Announcement.....	
8.15 to 8.19 a. m.	General call, QST de NPG.....	76 (3960)
8.19 to 8.23 a. m.	Standard frequency.....	
8.23 to 8.26 a. m.	Announcement.....	
8.30 to 8.34 a. m.	General call, QST de NPG.....	* 110 (2725)
8.34 to 8.38 a. m.	Standard frequency.....	
8.38 to 8.41 a. m.	Announcement.....	
8.45 to 8.49 a. m.	General call, QST de NPG.....	125 (2400)
8.49 to 8.53 a. m.	Standard frequency.....	
8.53 to 8.56 a. m.	Announcement.....	
<i>High power (Arc).</i>		
9 to 9.04 a. m.	General call, QST de NPG.....	28.5 (10500)
9.04 to 9.08 a. m.	Standard frequency.....	
9.08 to 9.11 a. m.	Announcement.....	
9.15 to 9.19 a. m.	General call, QST de NPG.....	* 35.0 (7900)
9.19 to 9.23 a. m.	Standard frequency.....	
9.23 to 9.26 a. m.	Announcement.....	

¹ For eastern standard time add three hours.

* May be changed later to 61.8 kilocycles (4,650 meters).

† Will be changed later to probably 66.3 kilocycles (4,325 meters).

‡ Reserved for future arc, installation not yet complete.

BUREAU OF STANDARDS MEASUREMENTS OF RADIO TRANSMITTING STATION FREQUENCIES.

The Bureau of Standards makes daily measurements in its laboratory at Washington on the frequencies of emitted waves from various stations. The purpose of this work is primarily to assist the radio inspection service in maintaining the stations on their licensed frequencies. The measurements to date have been mainly on class B broadcasting stations and on the low-frequency high-power transoceanic stations. The measurements show in general a gratifying degree of adherence to the assigned frequencies. In a few cases where the observation showed stations to be seriously off the assigned frequencies, supervisors of radio have readjusted the stations to the proper frequencies.

In only a few cases are the stations maintaining without exception the assigned frequencies so closely that the wave can be used as a frequency standard. Special attention is being given by the bureau to the stations which do maintain such standards, and an announcement will be made later in the Radio Service Bulletin stating the degree of constancy that has been observed, so that persons may utilize the transmissions from such stations as a frequency standard for the calibration of apparatus.

The method used by the bureau in measuring the frequencies of distant stations involves the use of a local radio-frequency generator. This is adjusted to the same frequency as the received wave from the transmitting station, this adjustment being determined by receiving both frequencies in a receiving set and varying the local generator until a zero beat note is obtained. The frequency of the local generator is then measured with a wave meter. Further details of the method are given in Bureau of Standards Letter Circular 92, Radio Signals of Standard Frequency and Their

Utilization. A limited supply of these is available at the bureau, and a copy may be obtained by a person having actual use for it by addressing the Bureau of Standards, Washington, D. C.

Results of the bureau's measurements of station frequencies are furnished only to the radio inspection service.

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.

- R007.5 British regulations for radio equipment. *Jour. Amer. Inst. Elec. Engrs.*, 42, p. 246, September, 1923.
 R007.6 The new French wireless regulations. *Wireless World and Radio Review*, 12, p. 675, August 15, 1923.
 R007.6 Projet de réglementation de la radiophonie en France. *Radioélectricité*, 4, pp. 293-299, August 1, 1923.
 R020 Cisin, H. G. The radio telephone handbook. *Radio Dealer*, 3, p. 71, September, 1923.

R100.—Radio principles.

- R100 Adam, M. La propagation des ondes: Représentation d'un train d'ondes entretenues dans les temps et dans l'espace. *Radioélectricité*, 4, pp. 266-267, July 15, 1923.
 R111 Fleming, J. A. Electrons, electric waves, and wireless telephony. *Radio News*, 5, pp. 394-395, October, 1923.
 R113.1 Final report on the fading tests (concluded from August issue). *QST*, 7, pp. 23-26, September, 1923.
 R114 Bäumlér, M. Das gleichzeitige Auftreten atmosphärischer Störungen. *Jahrbuch der drahtlosen Telegraphie*, 22, pp. 2-8, July, 1923.
 R120 Mason, H. F. The nodal point explained. *QST*, 7, pp. 11-14, September, 1923.
 R120 Gunn, R. The best dimensions for amateur antennas. *QST*, 7, pp. 27-29, September, 1923.
 R125.1 Adam, M. A propos de la radiogoniométrie: Les radiogoniomètres à cadres perpendiculaires. *Radioélectricité*, 4, pp. 309-302, August 1, 1923.
 R125.1 Direction finders help Lake boats. *Radio Digest Illustrated*, 8, p. 1, September 8, 1923.
 R125.1 Gernez, D. Tracé sur la carte des lignes de relevement constant d'un point terrestre. *L'Onde Electrique*, 2, pp. 406-410, July, 1923.
 R125.6 Kenneth, K. Notes on the Beverage antenna. *Radio (San Francisco)*, 5, pp. 17-18, September, 1923.
 R131 Schumacher, E. E. Process of coating (manufacture of thermionic cathodes). U. S. Patent No. 1467398, issued September 11, 1923.
 R131 A. R. D. E., the new Ediswan low-temperature valve. *Amateur Wireless (London)*, 3, pp. 212-213, September 1, 1923.
 R131 Mullard radio transmitting valve. *Radio (Toronto)*, 6, p. 25, August, 1923.
 R134.8 A simple type of Grimes in verse duplex set. *Radio and Model Engineering*, 3, pp. 141-149, 1923.
 R141.2 Steinmetz, B. Parallel resonance and coupling. *Radio (San Francisco)*, 5, p. 26, September, 1923.
 R145.3 Inductance of single-layer coils. *Wireless World and Radio Review*, 12, pp. 685-688, August 22, 1923.
 R147 Coursey, P. R. The amateur's experimental laboratory: VIII—Heterodyne methods of measurement. *Wireless World and Radio Review*, 12, pp. 551-553, July 28, 1923.
 R148.1 Pearson, S. O. Distortion in valve receiving circuits. *Wireless World and Radio Review*, 12, pp. 721-724, August 29, and pp. 786-793, September 12, 1923.
 R153 Winters, S. R. Navy comparison of arc and tube transmitters. *Radio (San Francisco)*, 5, p. 26, September, 1923.

R200.—Radio measurements and standardization.

- R200 Clavier, M. A. Quelques méthodes de mesure que l'amateur de T. S. F. doit connaître. *L'Onde Electrique*, 2, pp. 463-480, August, 1923.
 R210 Ferris, G. How radio is being used for checking scientific measurements. *Popular Radio*, 4, pp. 259-263, October, 1923.
 R230 The calculation and measurement of inductance (with tables). *Wireless Age*, 10, pp. 71-72, September, 1923.
 R230 Scott-Taggart, J. Notes on the values of inductances, condensers, and resistances in circuits. *Modern Wireless (London)*, 1, pp. 594-596, September, 1923.
 R240 Hartshorn, L. The measurement of power losses in dielectrics. *Beams (London)*, 64, pp. 89-103, August, 1923.
 R270 Kranz, F. W. Sensitivity of the ear as a function of pitch (audibility). *Physical Review*, 22, pp. 66-72, July, 1923.
 R281.31 Riddle, F. H. The production of porcelain for electrical insulation (VI). *Jour. Amer. Inst. Elec. Engrs.*, 42, pp. 938-994, September, 1923.

R300.—Radio apparatus and equipment.

- R320.8 Sawyer, C. R. How to make a good 70-foot mast. *QST*, 7, pp. 17-18, September, 1923.
- R328 Bouvier, P. Antennen mit Vielfach Erdung. *Jahrbuch der drahtlosen Telegraphie*, 22, pp. 9-27, July, 1923.
- R332 Herdman, W. J. Electron-discharge device. U. S. patent No. 1467518, issued September 11, 1923.
- R340 McGown, D. B. The design of radio apparatus. *Radio (San Francisco)*, 8, pp. 31-32, September, 1923.
- R341 Reuschler, H. C. Electron-tube apparatus. U. S. patent No. 1468997, issued August 28, 1923.
- R341 Reuschler, H. C. Detector tube. U. S. patent No. 1468998, issued August 28, 1923.
- R342.6 Frank, L. Radio-frequency amplification. *Radio News*, 5, pp. 396-398, October, 1923.
- R342.7 Cockaday, L. M. How to make a two-stage audio-frequency amplifier. *Popular Radio*, 4, pp. 288-293, October, 1923.
- R343 A long-range loop receiving set (4-tube Grimes inverse duplex). *Radio and Model Engineering*, 8, pp. 153-162, 1923.
- R348 Bickschaupt, B. S. Some point on the honeycomb tuner. *Radio News of Canada*, 2, pp. 25-26, September, 1923.
- R348 Nikirk, T. E. Tuned plate single-circuit receiver. *Radio Journal*, 8, p. 127, September, 1923.
- R348 Sargent, E. M. Designing a long-distance receiver. *Radio (San Francisco)*, 8, p. 11, September, 1923.
- R348.6 Roddy, J. T. The new Roddy hetro-trans (using special heterodyne transformer). *Radio Journal*, 8, pp. 112-115, September, 1923.
- R344.3 Falconi, L. A 200-watt phone, continuous wave, and interrupted continuous-wave transmitter. *Radio (San Francisco)*, 8, pp. 23-24, September, 1923.
- R374 Chapman, E. H. The crystal used in wireless (outline of crystals). *Modern Wireless (London)*, 1, pp. 388-392, September, 1923.
- R374 Snyder, J. The how and why of crystal detectors (theory). *Wireless Age*, 10, pp. 60-71, September, 1923.
- R376.3 Seabrook, B. R. Laminated horn and process of making same. U. S. Patent No. 1468519, issued September 18, 1923.
- R376.8 Nyman, A. Electrical loud speakers. *Jour. Amer. Inst. Elec. Engrs.*, 42, pp. 921-927, September, 1923.
- R377 Lertes, P. Der Creedsche Schnelltelegraphie. *Jahrbuch der drahtlosen Telegraphie*, 22, pp. 29-34, July, 1923.
- R377 Hoxie, C. A. High-frequency signaling system. U. S. Patent No. 1467988, issued September 11, 1923.
- R381 Demmler, P. E. Condenser and method of making the same. U. S. Patents Nos. 1467776 and 1467777, issued September 11, 1923.
- R381 Condenser capacity (principles, calculations, tables). *Amateur Wireless (London)*, 8, p. 180, August 18, and p. 202, August 25, 1923.
- R381 Cardwell, A. D. What you should know about condensers (part 2). *Radio Broadcast*, 3, pp. 510-516, October, 1923.
- R382 Lodge, O. Cell calculation. *Popular Radio*, 4, pp. 277-281, October, 1923.
- R384.1 Andrews, E. M. H., and Rapson, E. T. A. Note on the calibration of a heterodyne wave meter. *Electrician*, 91, pp. 214-215, August 31, 1923.
- R384.1 La Montagne, L. H. A vacuum tube wave meter. *Radio (San Francisco)*, 5, pp. 29-30, September, 1923.
- R384.1 Masking and calibrating a wave meter. *Amateur Wireless (London)*, 3, p. 176, August 18, 1923.
- R385.5 Trost, S. O. E. T. Transmitter for wireless telephony. U. S. Patent No. 1468250, issued September 18, 1923.
- R388 Johnson, J. B. The cathode-ray oscillograph. *Scientific American*, 129, p. 194, September, 1923.
- R388 Kipping, N. V. A low-voltage cathode-ray oscillograph. *Wireless World and Radio Review*, 12, pp. 759-762, September 5, 1923.

R400.—Radio communication systems.

- R401 Nichols, H. W. Transoceanic wireless telephony. *Jour. Inst. Elec. Engrs. (London)*, 61, pp. 812-822, July, 1923.
- R401 Ocean to Ocean broadcasting. *Radio Broadcast*, 3, pp. 447-457, October, 1923.
- R401 England's transoceanic radio system. *Wireless Age*, 10, pp. 53-54, September, 1923.
- R414 Alexandersod, E. F. W. High-frequency signaling system. U. S. Patent No. 1468263, issued August 28, 1923.
- R431 Elimination of interference. *Wireless World and Radio Review*, 12, p. 663, August 22, 1923.
- R431 Weagant, R. A. Method and apparatus for radiotelegraphing. U. S. Patents Nos. 1468959 and 1468961, issued September 18, 1923.
- R431 Weagant, R. A. Process and apparatus for receiving radio signals. U. S. Patent No. 1468960, issued September 18, 1923.
- R431 Weagant, R. A. Radiotelegraphing apparatus. U. S. Patent No. 1468962, issued September 18, 1923.
- R431 Taylor, A. H. System for receiving radiotelegraph signals. U. S. Patent No. 1468940, issued September 18, 1923.
- R431 Alexandersod, E. F. W. Wireless signaling system. U. S. Patents Nos. 1468961 and 1468962, issued August 28, 1923.
- R431 Butman, C. H. Scott clariphone kills static. *Radio (Toronto)*, 6, pp. 17-18, August, 1923.
- R460 Coppitta, E. H. Multiplex radiotelegraph system. U. S. Patent No. 1468932, issued August 28, 1923.
- R470 Jaquet, Lloyd. The human voice with a 100,000 volt kick (wired wireless). *Popular Radio*, 4, pp. 271-276, October, 1923.
- R470 Harris, W., Jr. Giving the public a light-socket broadcasting service (wired wireless). *Radio Broadcast*, 3, pp. 463-470, October, 1923.

R500.—Applications of radio.

- R516 Winters, S. E. How radio guides the Coast Guard. *Wireless Age*, 10, pp. 30-31, September, 1923.
- R523 Langer, N. Duplex radiotelephony on Continental railways. *Wireless World and Radio Review*, 12, pp. 729-731, August 29, 1923.
- R533 Saglio, M. Receptions radiotelephoniques sur trains en marche. *L'Onde Electrique*, 2, pp. 454-461, August, 1923.

- R550 Boucheron, P. A new station at Washington, D. C. (description of WRC, Radio Corporation station). *Radio Broadcast*, 2, pp. 494-495, October, 1923.
- R550 Horn, C. W. Radio broadcasting conditions. *Telegraph and Telephone Age*, 41, p. 412, September 1, 1923.
- R550 Agutter, J. J. What can be done to improve radio broadcasting. *Jour. of Elec.*, 51, pp. 129-130, August 13, 1923.
- R550 Broadcasting station directory (revised to August 13, 1923). *Wireless Age*, 10, pp. 49-50, September, 1923.
- R552 Regular transmissions of meteorological and other European Wireless telegraphy and telephony stations. *Wireless World and Radio Review*, 12, pp. 572-574, July 28, 1923.
- R555 Lamm, L. M. Give schedule for frequency signals. *Radio Digest Illustrated*, 6, p. 3, September 29, 1923.
- R555 Kruse, S. Getting away from 200 meters (Bureau of Standards Standard signals). *QST*, 7, pp. 18-21, September, 1923.
- R570 Hammond, J. H., Jr. System of radio directive control. U. S. Patent No. 1467154, issued September 4, 1923.
- R580 Hughes, F. M. University education by radio (University of Minnesota). *Wireless Age*, 10, pp. 28-29, September, 1923.
- R582 Roberts, J. H. T. The transmission of pictures by wireless. *Modern Wireless* (London), 1, pp. 552-556, September, 1923.
- R592 Une visite au centre radioélectrique de Londres. *Radioélectricité*, 4, pp. 284-288, August 1, 1923.
- R592 Jullian, L. Le nouveau poste radiotéléphonique de la Tour Eiffel. *L'Onde Électrique*, 2, pp. 437-453, August, 1923.
- R599 Edmunds, P. J. Long-distance radio reception in India. *Electrician*, 91, pp. 184-185, August 17, 1923.

R700.—Radio manufacturing.

- R700 How your valves are manufactured: Ediswan valve factory. *Amateur Wireless* (London), 3, pp. 172-174, August 13, 1923.

R800.—Newradio subjects.

- 537.55 Coursey, P. R. Some experiments illustrating the electrical properties of Neon lamps. *Wireless World and Radio Review*, 12, pp. 700-704, August 22, and pp. 778-779, September 5, 1923.
- 621.313.26 McCaa, D. Current relaying and production. U. S. Patent No. 1466912, issued September 4, 1923.
- 621.327.7 Hall, D. L. Dental film holder. U. S. Patent No. 1467850, issued September 11, 1923.
- 621.327.7 Raper, H. R. Film packet for X-ray work. U. S. Patent No. 1467876, issued September 11, 1923.
- 621.382.8 Kunze, W. Sender diaphragm for submarine sound signals. U. S. Patent No. 1468365, issued September 18, 1923.
- 621.382.8 Harlow, J. B. Detecting system. U. S. Patent No. 1466234, issued August 28, 1923.
- 621.385 Suckoff, S. Telephone repeater. U. S. Patent No. 1466858, issued September 4, 1923.
- 621.385.95 Wold, P. I. High-frequency modulation device. U. S. Patent No. 1467596, issued September 11, 1923.

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

PURCHASER AGREES NOT TO RESELL OR DISTRIBUTE THIS
COPY FOR PROFIT.—PUB. RES. 57, APPROVED MAY 11, 1922