

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, May 1, 1923—No. 73

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ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name	=Name of station.
Loc.	=Geographical location: O=west longitude, N=north latitude, S=south latitude.
Call	=Call letters assigned.
System	=Radio system used and sparks per second.
Range	=Normal range in nautical miles.
W. l.	=Wave lengths assigned: Normal wave lengths in italics.
Service	=Nature of service maintained.
	PG=General public.
	PR=Limited public.
	RC=Radio compass station.
	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.

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, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Chomly, Alaska ¹	KDP	300, 550, 600.....	FX	.....	Alaska Consolidated Canneries.
Pybus Bay, Alaska ² ...	KFG	300, 550, 600.....	FX	.....	Do.
Quadra, Alaska ³	KHD	300, 550, 600.....	FX	.....	Do.
Rose Inlet, Alaska ⁴ ...	KJC	300, 550, 600.....	FX	.....	Do.
Tea Harbor, Alaska ⁵ ...	KQP	300, 550, 600.....	FX	.....	Do.
Yes Bay, Alaska ⁶	KRU	300, 500, 600.....	FX	.....	Do.

¹ Loc. (approximately) 0.132° 20' 00", N. 63° 15' 00".

² Loc. (approximately) 0.134° 00' 00", N. 57° 20' 00".

³ Loc. (approximately) 0.130° 48' 00", N. 53° 05' 00".

⁴ Loc. (approximately) 0.132° 59' 00", N. 54° 57' 00".

⁵ Loc. (approximately) 0.134° 45' 00", N. 58° 25' 00".

⁶ Loc. (approximately) 0.131° 48' 00", N. 55° 55' 00".

NOTE.—System for all of the above-named stations is R. C. A., 240, range, 150, hours, 8-10 a. m. and 7-10 p. m.

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Range.	Service.	Hours.	Owner of vessel.	Station controlled by—
Arctic.....	KPHT	8	PG	X	H. Liebes & Co.....	R. C. A.
Dickenson.....	KPHG	8	PG	X	Commercial Pacific Cable Co.	Do.
Loki.....	KDGD	8	PG	X	Standard Oil Co. of New Jersey.	Do.
Mazatlan ¹	KUHQ	8	PG	X	California-Mexico S. S. Co.	Do.
Restless.....	KFGW					
Roosevelt.....	KPHN					
Secony Sl.....	KVAO	8	PG	X	Standard Oil Co. of New York.	Do.
St. Katherine.....	KPHE		PG	X	Red Salmon Canning Co.	
Virginia Olson.....	KPHM		PG	X	Oliver J. Olson.....	
Worrell Clarkson.....	KPHK		PG	X	Kinsman Transit Co..	Do.

¹ Range, 200; system, R. C. A., 1000; w. l., 370, 433, 650.

Commercial land and ship stations, alphabetically by call signals.

[b—ship station; e—land station.]

Call signal.	Name.	Call signal.	Name.
KDP	Chomly, Alaska.....	KPHN	Roosevelt.....
KFG	Pybus Bay, Alaska.....	KPHT	Arctic.....
KDGD	Loki.....	KHD	Quadra, Alaska.....
KFGW	Restless.....	KJC	Rose Inlet, Alaska.....
KPHE	St. Katherine.....	KQP	Tea Harbor, Alaska.....
KPHG	Dickenson.....	KRU	Yes Bay, Alaska.....
KPHK	Worrell Clarkson.....	KUBQ	Mazatlan.....
KPHM	Virginia Olson.....	KVAO	Secony Sl.....

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Broadcasting stations, alphabetically by names of cities.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922.]

City.	Call signal.	City.	Call signal.
Abilene, Tex.....	KFGM	Lake Forest, Ill.....	WABA
Alexandria, La.....	KFFY	Laporte, Ind.....	WRAF
Baton Rouge, La.....	KFGC	Norman, Okla.....	KFHC
Baudette, Minn.....	HFGY	Omaha, Nebr.....	KFFX
Berrien Springs, Mich.....	KFGZ	Orange, Tex.....	KFOX
Boone, Iowa.....	KFGQ	Shreveport, La.....	KPHF
Cheney, Kans.....	KFGI	St. Joseph, Mo.....	KPHD
Chickasha, Okla.....	KFGD	St. Louis, Mo.....	KFGJ
Dallas, Tex. (portable).....	KPFZ	Utica, Nebr.....	KPGV
Denver, Colo.....	KPIC	Wichita, Kans.....	KPHI
Harrisburg, Pa.....	WABB		

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, 1922.]

Call signal.	Station operated and controlled by—	Location of station.	Power (watts).	Wave length.	Frequency (kilo-cycles).
KFFX	McGraw Co.....	Omaha, Nebr.....	250	378	1080
KFFY	Pincus & Murphey.....	Alexandria, La.....	100	275	1090
KPFZ	Al. G. Barnes Amusement Co.....	Dallas, Tex. (portable).....	20	226	1330
KFGC	Louisiana State University.....	Baton Rouge, La.....	100	354	1180
KFGD	Chickasha Radio & Electric Co.....	Chickasha, Okla.....	20	248	1210
KFGI	Missouri National Guard, 138th Infantry.....	St. Louis, Mo.....	100	266	1130
KFGM	Abilene Daily Reporter.....	Abilene, Tex.....	100	233	1290
KFGQ	Cheney Radio Co.....	Cheney, Kans.....	10	229	1310
KFGV	Crary Hardware Co.....	Boone, Iowa.....	20	226	1330
KFGX	Heidbreder Radio Supply Co.....	Utica, Nebr.....	10	224	1340
KFGY	First Presbyterian Church.....	Orange, Tex.....	500	250	1200
KFGZ	Gjelhaug's Radio Shop.....	Baudette, Minn.....	20	224	1340
KFHC	Emmanuel Missionary College.....	Berrien Springs, Mich.....	10	268	1120
KPHD	University of Oklahoma.....	Norman, Okla.....	20	254	1180
KPHF	Uta Electric Shop Co.....	St. Joseph, Mo.....	10	226	1330
KPHI	Central Christian Church.....	Shreveport, La.....	150	266	1130
KPIC	Charles V. Dixon.....	Wichita, Kans., 411 Fannie Avenue.....	20	224	1340
	Philip Laskowitz.....	Denver, Colo., 611 Marion Street.....	15	224	1340
WABA	Lake Forest College.....	Lake Forest, Ill.....	100	266	1130
WABB	Dr. John B. Lawrence.....	Harrisburg, Pa.....	10	226	1130
WRAF	The Radio Club (Inc.).....	Laporte, Ind.....	10	224	1340

Government land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Eagle Harbor, Mich. ¹ ..	NUG	800.....	RC	X	U. S. Navy.
Hilo, Hawaii.....	NPH	507.....	O	N	Do.
Hot Springs, Alaska ² ..	WKK	423, 440, 580, 620.....	O	X	U. S. Army.
Inglewood, Calif. ³	NPX	365, 600, 975, 1851, 2400, 2750, 3680, 4325.....	O	N	U. S. Navy.
Ofu, Samoa.....	NGX	300, 600.....	PG	N	Do.
Ruby, Alaska ⁴	WVF	325, 450, 520, 600.....	O	X	U. S. Army.
Tap, Samoa.....	NCM	300, 600.....	PG	N	U. S. Navy.
Valdez, Alaska ⁵	WXJ	1000, 1100, 1200, 1500.....	O	X	U. S. Army.
Virginia Beach, Va. ⁶ ..	NAM	507.....	O	N	U. S. Navy.
West Memphis, Ark. ⁷ ..	WYCI		O		U. S. Army.

¹ System, U. S. Navy, 1000.

² Loc. 0.150° 58' 15", N. 64° 55' 10"; range, 100; system, U. S. Army, v. t. telephone and telegraph.

³ Loc. 0.118° 14' 32", N. 34° 03' 05"; range, 850; system, U. S. Navy arc and spark.

⁴ Loc. 0.155° 30' 27", N. 64° 42' 20"; range, 100; system, U. S. Army v. t. telephone and telegraph.

⁵ Loc. (approximately) 0.146° 17' 00", N. 61° 06' 00"; range, 25; system, composite, v. t. telephone.

⁶ Loc. 0.75° 58' 58", N. 36° 50' 28"; range, 135; system, U. S. Navy.

⁷ Range, 200; system, U. S. Navy, 1000.

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Government ship stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Serv-ice.	Hours.	Station controlled by—
B. M. Harrod.....	WYCI	.....	O	.....	U. S. Army.
Gama.....	WYCE	.....	O	.....	Do.
Guide.....	NIJN	.....	O	X	Coast and Geodetic Survey, Department of Commerce.
Henry Flad.....	WYCH	.....	O	.....	U. S. Army.
Inspector.....	WYCB	.....	O	.....	Do.
Iota.....	WYCF	.....	O	.....	Do.
Jupiter.....	WYCC	.....	O	.....	Do.
Kappa.....	WYCG	.....	O	.....	Do.
Saturn.....	WYCD	.....	O	.....	Do.
Vaughan.....	NITD	.....	O	.....	Coast Guard Service, Treas- ury Department.

Note.—All of the above-named vessels, which are operated and controlled by the U. S. Army, are equipped with U. S. Navy spark apparatus (1000), and the range is 200 miles.

Government land and ship stations, alphabetically by call signals.

[b=ship station; c=land station.]

Call signal.	Name of station.	Call signal.	Name of station.
NAM	Virginia Beach, Va.....c	WKK	Hot Springs, Alaska.....c
NCM	Tau, Samoa.....c	WYCB	Inspector.....b
NGX	Ofu, Samoa.....c	WYCC	Jupiter.....b
NIJN	Guide.....b	WYCD	Saturn.....b
NITD	Vaughan.....b	WYCE	Gama.....b
NPH	Hilo, Hawaii.....c	WYCF	Iota.....b
NPX	Inglewood, Calif.....c	WYCG	Kappa.....b
NUG	Eagle Harbor, Mich.....c	WYCH	Henry Flad.....b
WVF	Ruby, Alaska.....c	WYCI	B. M. Harrod.....b
WXJ	Valdez, Alaska.....c	WYCJ	West Memphis, Ark.....c

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1922.]

Station.	Call signal.	Wave lengths.	Station controlled by—
Altadena, Calif.....	6XBF	Variable.....	Altadena Radio Laboratory.
Baldwinsville, N. Y....	8XAV	290, 375.....	J. E. Page.
Cincinnati, Ohio (tem- porary).....	8XAW	309.....	U. S. Playing Card Co.
Eastontown, N. J.....	2XAU	5 to 100.....	Western Electric Co., 196 Broadway, New York, N. Y.
New York, N. Y (port- able).....	2XAV	5 to 100.....	Do.
New York, N. Y.....	2XAW	380, 405, 453, 485.....	Ship Owners Radio Service.
Sand Springs, Okla.....	5XBF	200, 220.....	Halton H. Friend, Box 556.

Special land stations, grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
2XAU	Second district: Eastontown, N. J.	6XBF	Sixth district: Altadena, Calif.
2XAV	New York, N. Y. (portable).	8XAV	Eighth district: Baldwinsville, N. Y.

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, 1922, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

AKUTAN, ALASKA.—W. I., 300, 600, 1600.
 ENSENADA, P. R.—Loc. $0.66^{\circ} 55' 50''$, N. $17^{\circ} 58' 15''$.
 FORT MORGAN, ALA.—System, U. S. Signal Corps, 1000 and Simon, 1000; service, PG.
 LAZY BAY, ALASKA.—System, composite, 460.
 NEW ORLEANS, LA.—System, composite v. t. telephone and telegraph, and composite spark, 1000; rates, ship service 10 c. per word.
 TAMPA, FLA.—Hours, 5 a. m.—12 midnight.
 WILMINGTON, CALIF. (LOS ANGELES).—Range, 300; system, R. C. A., 1000; w. I., 300, 450, 600.
 Strike out all particulars of the following-named stations: Rockland, Me., and Rogers, Mich. (WCAF).

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, 1922, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ABERCOB.—W. I., 300, 450, 600.
 ABSECON.—System, Kilbourne & Clark, 1000; w. I., 300, 450, 600.
 ADMIRAL FISKE.—System, R. C. A., 1000; w. I., 300, 450, 600.
 ADMIRAL MAYO.—R. W. Crosby owner of vessel.
 ALADDIN.—W. I., 300, 450, 600.
 A. L. KENT.—Rates, 8 c. per word.
 ALLEGHANY.—Station operated and controlled by I. W. T. Co.; rates, 8 c. per word.
 AMOLCO.—Rates, 8 c. per word.
 APUS.—Name changed to Charles R. McCormick; McCormick Intercoastal S. S. Co. owner of vessel.
 ARAPAHOE (KFFM).—Range, 150; system, R. C. A., 1000; w. I., 300, 450, 600; station operated and controlled by owner of vessel; rates, 8 c. per word.
 ARGUS.—Name changed to Sidney M. Hauptman; w. I., 300, 450, 600; McCormick Intercoastal S. S. Co. owner of vessel.
 BAKERSFIELD.—W. I., 300, 450, 600.
 BARACOA.—Colombian S. S. Co. owner of vessel; station operated and controlled by I. W. T. Co.
 BARBARA C.—Range, 150; system, R. C. A., 1000; w. I., 300, 450, 600.
 BAYTOWN.—System, R. C. A., 1000; w. I., 300, 450, 600.
 BAYVIEW.—System, R. C. A., 1000; w. I., 300, 450, 600.
 BETHLEBRIDGE.—System, Navy-R. C. A., 1000; hours, X.
 BIDWELL.—Sun Shipbuilding Co. owner of vessel.
 BOGOTA.—Colombian S. S. Co. owner of vessel.
 BOHEMIAN CLUB.—Atlantic Refining Co. owner of vessel.
 BOSTON.—Range, 150; system, Cutting & Washington, 1000; w. I., 300, 450, 600; station operated and controlled by I. W. T. Co.; rates, 8 c. per word.
 BRIDGETOWN.—Colombian S. S. Co. owner of vessel.
 BYLAL.—Pocahontas S. S. Co. owner of vessel.
 C. A. CANFIELD.—System, R. C. A., 1000.
 CALVIN AUSTIN.—System, R. C. A., 1000; w. I., 300, 450, 600.
 CAMDEN (KRC).—System, R. C. A., 1000.
 CAROLINAS.—W. I., 300, 450, 600.
 CARRABULLE.—System, Navy-R. C. A., 1000.
 CASSIMIR.—Station operated and controlled by R. C. A.
 CASTLE TOWN.—Chas. R. McCormick S. S. Co. owner of vessel; station operated and controlled by I. W. T. Co.
 CATHERINE D.—W. I., 300, 450, 600.
 CAUTO.—W. I., 300, 600.
 CHILLICOTHE.—Range, 200; system, U. S. Navy, 1000; w. I., 300, 450, 600; Columbia River Packers Association owner of vessel; station operated and controlled by owner of vessel; rates, 4 c. per word.
 CITY OF ALAMEDA.—System, Navy-R. C. A., 1000; w. I., 300, 450, 600; station operated and controlled by R. C. A.
 COLLINGSWORTH.—System, Navy-Wireless Specialty Apparatus Co., 1000.

- COMMERCIAL GUIDE.—Range, 300; w. l., 300, 450, 600.
 CORVUS.—Planet S. S. Corp. owner of vessel.
 COVEDALE.—Name changed to Muncove.
 CRIPPLE CREEK.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.
 CUPRUM.—Station operated and controlled by S. O. R. S. (U. S. L.).
 DELFINA.—Baltimore S. S. Co. owner of vessel.
 DELROSA.—Station operated and controlled by S. O. R. S.
 DERBYLINE.—Station operated and controlled by I. W. T. Co.
 DEROCHE.—Union Oil Co. owner of vessel.
 DEVOLENTE.—Beacon Oil Co. owner of vessel.
 DIRIGO.—W. l., 300, 450, 600.
 DUNGANNON.—Station operated and controlled by I. W. T. Co.
 DURANGO.—Malston Co. owner of vessel; station operated and controlled by I. W. T. Co.
 EASTERN GALE.—Range, 300; system, R. C. A., 1000; w. l., 300, 600.
 EDELLYN.—Name changed to Dorothy Luckenbach; Luckenbach S. S. Co. owner of vessel.
 EDWARD PIERCE.—Rates, 8 c. per word.
 EDWARD SEWALL.—Range, 150; system, R. C. A., 1000; w. l., 300, 450, 600; station operated and controlled by owner of vessel; rates, 8 c. per word.
 ERLBECK.—Station operated and controlled by S. O. R. S.
 ELDENA.—System, Navy-Lowenstein, 1000.
 E. L. DOHENY, THIRD.—Pan-American Petroleum & Transport Co. owner of vessel.
 E. R. STERLING.—System, composite, 1000; w. l., 300, 600; rates, 8 c. per word.
 FELIX TAUSSIG.—Rates, 8 c. per word.
 FREDERIC EWING.—System, R. C. A., 1000.
 FREEMAN.—Pocahontas S. S. Co. owner of vessel.
 GOVERNOR JOHN LIND.—System, Navy, 1000.
 HADNOT.—System, Navy, 1000; w. l., 300, 450, 600.
 HALO.—W. l., 300, 450, 600, 1800; Cities Service Co. owner of vessel; station operated and controlled by R. C. A.
 HALSEY.—Malston Co. owner of vessel; station operated and controlled by I. W. T. Co.
 HALWAY.—W. l., 300, 450, 600, 1800.
 HERBERT G. WYLIE.—System, R. C. A., 1000.
 HUMACONNA.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 450, 600.
 INDIAN.—W. l., 300, 450, 600.
 INSPECTOR.—Station operated and controlled by I. W. T. Co. (U. S. L.)
 INTREPID.—System, R. C. A., 1000.
 IRIS.—System, R. C. A., 1000.
 JAMESTOWN.—Rates, 8 c. per word.
 JAPAN ARROW.—W. l., 300, 450, 600.
 JONANCY.—Pocahontas S. S. Co. owner of vessel.
 JUNEAU.—Station operated and controlled by owner of vessel.
 KENNECOTT.—W. l., 300, 450, 600.
 KISHACOQUILLAS.—Station operated and controlled by I. W. T. Co.
 LAKE GERA.—Name changed to Southlands; station operated and controlled by S. O. R. S.
 LAKE GRAPHITE.—Name changed to West Africa; station operated and controlled by S. O. R. S.
 LANCASTER.—System, Navy-Lowenstein, 1000; w. l., 300, 450, 600.
 LEWIS K. THURLOW.—W. l., 300, 600; rates, 8 c. per word.
 LILLIAN LUCKENBACH.—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 450, 600.
 LUBRICO.—Station operated and controlled by S. O. R. S. (U. S. L.).
 MERIDEN.—E. K. Wood Lumber Co. owner of vessel.
 MOUNT EVANS.—System, Navy-R. C. A., 1000; w. l., 300, 450, 600.
 MUNALBRO.—System, R. C. A., 1000.
 MUNMOTOR.—System, Navy-R. C. A., 1000.
 MURSA.—Station operated and controlled by S. O. R. S. (U. S. L.).
 NARCISSUS.—W. l., 300, 450, 600, 1800.
 NORTH KING.—Range, 150; system, R. C. A., 1000; w. l., 300, 450, 600; station operated and controlled by owner of vessel; rates, 8 c. per word.
 NORTH LAND (KJD).—System, R. C. A., 1000.
 NORTHLAND (WGF).—Range, 150; rates, 8 c. per word.
 OGONTZ.—System, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600.
 ONEIDA (KYP).—Range, 300; system, Telefunken, 1000; w. l., 300, 450, 600.

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PENNSYLVANIA SUN.—Sun Oil Co. owner of vessel.
 PERFECTION.—Range, 300.
 PETER H. CROWELL.—System, Navy-Simon, 1000; rates, 8 c. per word.
 PETER KERR.—Station operated and controlled by owner of vessel.
 PHYLLIS.—Station operated and controlled by R. C. A.
 PLYMOUTH (KND).—C. H. Sprague & Son Co. owner of vessel.
 PORTOLA PLUMAS.—Name changed to W. E. Hutton; Pure Oil S. S. Co. owner of vessel; station operated and controlled by R. C. A.
 RADIANT.—System, R. C. A., 1000.
 RAYO.—Standard Transportation Co. owner of vessel.
 REDONDO (KYT).—Name changed to Delecto; system, R. C. A., 1000.
 REDONDO (WBM).—Range, 200.
 RICHMONCAL.—Beacon Oil Co. owner of vessel.
 ROCHESTER.—System, R. C. A., 1000; w. l., 300, 450, 600.
 SANTA CECILIA.—System, R. C. A., 1000; w. l., 300, 450, 600; Planet S. S. Corp. owner of vessel.
 SANTA ISABEL.—System, R. C. A., 1000.
 SEA SCOUT.—Range, 150; system, R. C. A., 1000; w. l., 300, 450, 600; rates, 8 c. per word.
 SIBONEY.—System, Navy-Lowenstein, 1000; and I. W. T. Co. arc; w. l., 300, 450, 600, 1800.
 SOCONY 85.—System, R. C. A., 1000; Standard Transportation Co. owner of vessel.
 SOCONY 88.—System, R. C. A., 1000.
 SOCONY 90.—Standard Transportation Co. owner of vessel.
 STANWOOD.—Range, 150; system, R. C. A., 1000; w. l., 300, 450, 600.
 STAR OF RUSSIA.—Range, 150; system, R. C. A., 1000; w. l., 300, 450, 600; station operated and controlled by owner of vessel; rates, 8 c. per word.
 STEPHEN R. JONES.—Rates, 8 c. per word.
 SUDURCO.—Rates, 8 c. per word.
 SUSQUEHANNA (WEM).—Herman Kaczyk, owner of vessel; station operated and controlled by R. C. A.
 SWIFTSURE.—System, R. C. A., 1000.
 THOMAS P. BEAL.—Rates, 8 c. per word.
 TIDEWATER.—Name changed to Isaac T. Mann; Pocahontas S. S. Co., owner of vessel.
 TUSTEM.—Atlantic Refining Co., owner of vessel.
 VACOIL.—Station operated and controlled by R. C. A.
 VOLUNTEER.—System, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, 600; station operated and controlled by R. C. A.
 WAIMEA.—System, R. C. A., 1000; service, PG; station operated and controlled by R. C. A.; rates, 8 c. per word.
 WALLINGFORD.—System, Navy-R. C. A., 1000; w. l., 300, 450, 600; McCormick S. S. Line, owner of vessel.
 WALLULA.—Station operated and controlled by owner of vessel.
 WALTER D. NOYES.—Rates, 8 c. per word.
 WARSZAWA.—Name changed to Stanley Dollar; Robert Dollar Co., owner of vessel.
 WARWICK.—Union Oil Co., owner of vessel.
 WEST CACTUS.—Station operated and controlled by I. W. T. Co. (U. S. L.).
 WESTERN SPIRIT.—Station operated and controlled by I. W. T. Co. (U. S. L.).
 WESTLAKE.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, 600.
 WEST MOMENTUM.—Station operated and controlled by R. C. A. (U. S. L.).
 WEST TOTANT.—Station operated and controlled by R. C. A.
 W. F. WHITE.—System, Navy-Wireless Specialty Apparatus Co., 1000; rates, Great Lakes service, 6 c. per word.
 WHITNEY OLSON.—Oliver J. Olson & Co., owner of vessel.
 WILLIAM A. MCKENNEY.—Rates, 8 c. per word.
 W. S. MILLER.—W. l., 300, 450, 600.
 ZAPORA.—Range, 250.
 Strike out all particulars of the following-named vessels: Barkhamstead, Coolcha, Lake Galisteo, Lincoln Land, Mauna Kea, and Yadkin.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDBZ, read Charles R. McCormick; KEMN, read Muncove; KIJL, read Dorothy Luckenbach; KOKS, read Southlands; KOU, read Isaac T. Mann; KUMN, read W. E. Hutton; KUVJ, read Sidney M. Hauptman; KYT, read Delecto; WLM, read Stanley Dollar; WZOA, read West Africa; strike out all particulars following

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, 1922.]

KDYS (Great Falls, Mont.).—W. L., 360 only.
 KEFO (Hillsboro, Oreg.).—Correct call signal KFFO.
 KFAU (Boise, Idaho).—W. L., 360 only.
 KPAY (Medford, Oreg.).—W. L., 360 only.
 KFBB (Havre, Mont.).—W. L., 360 only.
 KFDF (Casper, Wyo.).—Station operated and controlled by Casper Community Radio Corp.; w. l., 360 only.
 KLZ (Denver, Colo.).—W. L., 360 only.
 KZN (Salt Lake City, Utah).—W. L., 360 only.
 WAAW (Omaha, Nebr.).—W. L., 360 only.
 WCAW (Quincy, Ill.).—W. L., 360 only.
 WCM (Austin, Tex.).—W. L., 360 only.
 WCX (Detroit, Mich.).—W. L., 400 only.
 WDAJ (College Park, Ga.).—W. L., 360 only.
 WEAU (Sioux City, Iowa).—W. L., 360 only.
 WFAV (Hutchinson, Minn.).—W. L., 360 only.
 WFAV (Lincoln, Nebr.).—W. L., 360 only.
 WFAT (Sioux Falls, S. Dak.).—W. L., 360 only.
 WPI (Philadelphia, Pa.).—W. L., 400 only.
 WGR (Buffalo, N. Y.).—W. L., 360 only.
 WGV (New Orleans, La.).—W. L., 360 only.
 WHA (Madison, Wis.).—W. L., 360 only.
 WHAM (Rochester, N. Y.).—W. L., 360 only.
 WHB (Kansas City, Mo.).—W. L., 400 only.
 WIAY (Washington, D. C.).—W. L., 360 only.
 WJAG (Norfolk, Nebr.).—W. L., 360 only.
 WKAA (Cedar Rapids, Iowa).—W. L., 360 only.
 WLW (Cincinnati, Ohio).—W. L., 360 only.
 WMC (Memphis, Tenn.).—W. L., 400 only.
 WOC (Davenport, Iowa).—W. L., 400 only.
 WOI (Ames, Iowa).—W. L., 360 only.
 WOO (Philadelphia, Pa.).—W. L., 400 only.
 WQAN (Scranton, Pa.).—W. L., 360 only.
 WQAR (Muncie, Ind.).—Call signal changed to WJAF.
 WRAF (Winter Park, Fla.).—Correct call signal WRAP.
 WRAY (Scranton, Pa.).—W. L., 360 only.
 WWJ (Detroit, Mich.).—W. L., 400 only.
 Strike out all particulars of the following-named stations: KDZA, Tucson, Ariz.; KDZZ, Everett, Wash.; KZC, Seattle, Wash.; WBAG, Bridgeport, Pa.; WFAY, Independence, Kans.; WGAk, Macon, Ga.; WGAT, Lincoln, Nebr.; WIAZ, Miami, Fla.; WNAK, Manhattan, Kans.; WOZ, Richmond, Ind.; WPAV, Laurium, Mich.; WPAX, Thomasville, Ga.; and WSAS, Lincoln, Nebr.

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, 1922, and to the International List of Radiotelegraph Stations, published by the Bureau.]

CHICAGO, ILL. (WWC).—Changed to Maywood, Ill.; call signal changed to KDQA.
 CIRCLE, ALASKA.—W. L., add 1700, 2200.
 FAIRBANKS, ALASKA.—System, Federal arc; w. l., 2000, 2600, 3200, 3700, 4100, 4700, 5000.
 FORT EGBERT, ALASKA.—Range, 100; w. l., add 550, 575, 630.
 FORT GIBBON, ALASKA.—System, Telefunken, 1000; w. l., 1100, 1275, 1875, 2200.
 FORT ST. MICHAEL, ALASKA.—Range, 100; w. l., 450, 525, 550, 600.
 FORT YUKON, ALASKA.—System, R. C. A., 1000; w. l., 600, 1000.
 HOLY CROSS, ALASKA.—Range, 100; w. l., 410, 450, 525, 550.
 IDITAROD, ALASKA.—Range, 100; w. l., 425, 510, 580, 600.
 LIVENGOOD, ALASKA.—W. l., add 520.
 McGRATH, ALASKA.—Range, 100.
 NOME, ALASKA.—System, Federal arc, U. S. Navy arc and v. t. telephone and telegraph; w. l., 510, 550, 575, 600, 3000, 3500, 4000, 5000.
 NOME, ALASKA.—Range, 100; w. l., 495, 475, 500, 550, 200

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NULATO, ALASKA.—Range, 100; w. l., 655, 660, 730, 760.

Strike out all particulars of the following-named stations: Boston Light Vessel (L. V. No. 54), Brenton Reef Light Vessel (L. V. No. 39), Charleston Light Vessel (L. V. No. 34), Cross Rip Light Vessel (L. V. No. 20), Great Round Shoals Light Vessel (L. V. No. 66), Handkerchief Light Vessel (L. V. No. 3), Hedge Fence Light Vessel (L. V. No. 9), Hen & Chickens Light Vessel (L. V. No. 42), Martins Industry Light Vessel (L. V. No. 1), Minneapolis, Minn., Overfalls Light Vessel (L. V. No. 69), Pollock Rip Light Vessel (L. V. No. 47), Pollock Rip Slue Light Vessel (L. V. No. 73), Portland Light Vessel (L. V. No. 74), Ram Island Reef Light Vessel (L. V. No. 23), Relief Light Vessel No. 4, Relief Light Vessel No. 16, Relief Light Vessel No. 49, Relief Light Vessel No. 86, Scotland Light Vessel (L. V. No. 11), South Pass Light Vessel (L. V. No. 102), Stone Horse Shoal Light Vessel (L. V. No. 5), Tail of Horseshoe Light Vessel (L. V. No. 46), and Vineyard Sound Light Vessel (L. V. No. 41).

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, 1922, and to the International List of Radiotelegraph Stations, published by the Berns bureau.]

ALEXANDER HAMILTON. Range, 150; system, Navy-Simon, 1000; w. l., 300, 600, 975, service PG.
 AMARANTH.—Station operated and controlled by Lighthouse Service, Department of Commerce.
 DISCOVERER.—Range, 200; system, U. S. Navy, 1000; w. l., 300, 600, 1200.
 FATHOMER.—Service, O; hours, X.
 HYACINTH.—Station operated and controlled by Lighthouse Service, Department of Commerce.
 MARINDUQUE.—Service, O; hours, X.
 PIONEER.—Range, 200; system, U. S. Navy, 1000; w. l., 300, 600, 1200; service, O; hours, X.
 RELIEF LIGHTSHIP No. 53.—Name changed to "Relief."
 RELIEF LIGHT VESSEL No. 78.—Name changed to "Relief."
 RELIEF LIGHT VESSEL No. 90.—Name changed to "Relief."
 WENONAH.—Station operated and controlled by U. S. Navy Department.
 Strike out all particulars of the following-named vessels: Bothwell, Boyce, Carr, Cook, Earp, Iris, Johanson, Klingelhofer, Knudsen, Larsen, Laurel, McGourty, Mehalatos, Natoma, Oveson, Richards, Scally, and Taylor.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

WWC, changed to Maywood, Ill., call signal KDQA; NAJC, read Relief; NITR, read Relief; NITS, read Relief; strike out all particulars following the call signals KDPB, NABJ, NACX, NADX, NAFT, NAGT, NAJJ, NAKT, NALL, NALV, NAMS, NANS, NANT, NAPP, NAQB, NAQS, NART, NARV, NARX, NASB, NASK, NATD, NAZJ, NAZR, NAZV, NAJV, NEKC, NEKD, NEKF, NESO, NEXL, NEXP, NIDG, NIDL, NIGT, NIQP, NISC, NISD, NITB, NITK, NIZD, and NUGG.

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, 1922.]

AUSTIN, TEX. (5XX).—W. l., variable to 220.
 BERKELEY, CALIF. (6XAY).—W. l., variable 200 to 500.
 BOULDER, COLO. (9XAQ).—W. l., variable to 375.
 BROOKLINE, MASS. (1XA).—W. l., 150, 250, 325.
 CLEVELAND, OHIO (8XM).—W. l., 200, 375.
 DALLAS, TEX. (5XADA).—Call signal changed to 5XBC.
 DUBLIN, TEX. (5XAJ).—W. l., variable to 220.
 FRESNO, CALIF. (6XU).—W. l., 200, 375, variable.
 LOS ANGELES, CALIF. (6XD).—W. l., 200, variable.
 NEW ORLEANS, LA. (5XAO).—W. l., variable 200 to 500.
 NEWTON, MASS. (1XK).—W. l., variable 200 to 500.
 NEW YORK, N. Y. (2XAT).—W. l., 220, 350, 275, 320.
 NEW YORK, N. Y. (2XU).—W. l., 420, 3,000, 4,000.
 PAWTAUCKET, R. I. (1XAD).—W. l., variable 200 to 600.

PORTLAND, OREG. (7XL).—W. l., variable.
 SAN DIEGO, CALIF. (6XAI).—W. l., 360.
 SAN DIEGO, CALIF. (6XZ).—W. l., variable 200 to 360.
 SCHENECTADY, N. Y. (2XA).—W. l., 200, variable.
 SCHENECTADY, N. Y. (2XAE).—W. l., 200, 375.
 STAPLETON, N. Y. (2XAC).—W. l., 200, variable.
 URBANA, ILL. (9XJ).—W. l., variable to 375.
 WINTER PARK, FLA. (4XK).—Station operated and controlled by C. J. Holdorf.
 Strike out all particulars of the following-named stations: Bridgeport, Pa. (3XAE);
 Kearney, Nebr. (9ZAB); Olympia, Wash. (7ZP); Seattle, Wash. (7XT); St. Louis,
 Mo. (9ZV); and Whitford, Pa. (3ZT).

MISCELLANEOUS.

STATIONS VIOLATING SECTION 4, ACT OF AUGUST 13, 1912.

It has been brought to the attention of the department that some coast stations and ships in the vicinity of the coast are apparently violating the fourteenth regulation, section 4, act of August 13, 1912, which reads as follows: "In all circumstances, except in case of signals or radiograms relating to vessels in distress, all stations shall use the minimum amount of energy necessary to carry out any communication desired."

The penalties provided for this violation follow:

"For violation of any of these regulations, subject to which a license under sections 1 and 2 of this act may be issued, the owner of the apparatus shall be liable to a penalty of \$100, which may be reduced or remitted by the Secretary of Commerce, and for repeated violations of any of such regulations the license may be revoked.

"For violation of any of these regulations, except as provided in regulation 19, subject to which a license under section 3 of this act may be issued, the operator shall be subject to a penalty of \$25, which may be reduced or remitted by the Secretary of Commerce, and for repeated violations of any such regulations the license shall be suspended or revoked."

WAVE LENGTHS AND HOURS FOR VESSELS OF NORTH ATLANTIC ICE PATROL SERVICE.

The vessel on duty in the ice fields, call letters KFOG, transmits ice information on 600 meters at 6 a. m. and 6 p. m. and on 2,300 meters at 8.30 p. m., seventy-fifth meridian time. Radio operators will desist, as far as practicable, from operating at the above-cited times, in order that there be no interference.

ALASKA STATIONS REOPENED.

Akutan (KMW), opened April 22; Chisik Island (KUCP), opened April 14; False Pass (KJL), opened March 26; Hawk Inlet (KKAI), opened April 5; Nelson Lagoon (KXV), opened April 19; Port Althorp (KLW), opened April 3; Port Moller (KWR), opened April 14.

TITLE OF RADIO INSPECTORS CHANGED.

The title of all radio inspectors in charge of the different radio districts has been changed to "Supervisor of Radio." In future all correspondence should be addressed "Supervisor of Radio" in lieu of Radio Inspector.

NEW INTERNATIONAL LIST OF RADIOTELEGRAPH STATIONS.

The International Bureau of the Telegraph Union, Radiotelegraph Service, Berne, Switzerland, has advised this office that a new edition (eighth) of the International List of Radiotelegraph Stations is now ready for distribution. The price of this publication, together with all supplements, is 14 Swiss francs, including postage. All orders should be placed direct with the international bureau at Berne.

INFORMATION FROM THE HYDROGRAPHIC OFFICE.

Special time signal, Annapolis radio station, Md.—Arrangements have been made for the transmission of a series of special time signals from Annapolis, Md. (NSS), on a wave length of 17,145 meters c. w., from 3.55 to 4.00, seventy-fifth meridian time. [The signals will be transmitted from April 20 to October 15, 1923, and full power

Weather bulletins, Lake Michigan.—For the present all broadcasting of weather bulletins on the Great Lakes will be made from the United States naval radio station at Great Lakes (NAJ), in (approximately) latitude 42° 18' 30" N., longitude 87° 50' 00" W., by spark on wave length of 1,988 meters, as heretofore, the time of transmission (11.00, 12.00, 17.30, 23.00, 23.30, seventy-fifth meridian time) remaining unchanged.

Hydrographic information, Great Lakes.—Hydrographic information collected by the Hydrographic Office will be broadcast by the Great Lakes Naval Station (NAJ) at 10.45 a. m. and 5 p. m. on 4,650 meters c. w. These schedules will be copied by the naval station at Detour Point, Whitefish Point, Grand Marais, and Eagle Harbor and will be rebroadcast by each station at 11 a. m. and 5.15 p. m. on 600 meters, spark. Great Lakes station will rebroadcast the same information at 11 a. m. and 5.15 p. m. on 1,988 meters, spark. All times mentioned are seventy-fifth meridian.

Weather bulletin, Scheveningen, Holland.—On March 15 last the weather bulletins sent out by this station at 23.15 G. M. T. were discontinued. Storm warnings and notices to mariners, if necessary, will continue to be transmitted at the above hour, the former being preceded by the letters KNMI and the latter by the letters NBAZ.

Free medical advice by radio, Gothenburg.—Through cooperation between the Swedish telegraph administration and the hospital authorities of Gothenburg vessels at sea, regardless of nationality, may now obtain free medical advice through this station. The master of a vessel which is in need of medical advice should address a radiogram in Swedish, English, German, or French to the above-named station, stating briefly the symptoms of the person afflicted. This radiogram will be forwarded to the Allmanna and Sahlgrenska Hospital, from which free advice will be forwarded to the vessel through the Gothenburg station. All messages should be signed by the master of the vessel.

INFORMATION FROM THE BERNE BUREAU.

South Africa.—The coast station East London is open. The particulars of this station are as follows: Call letters, VNO; range, 60 miles; wave length, 600 meters; service, PG; hours, N; coast rate, 60 centimes per word; accounts are settled by the postmaster general at Pretoria.

Southwest Africa.—The coast station Walvis Bay is open to general public traffic.

Denmark.—Since February 1 last the coast rate of Danish stations is 30 centimes per word, minimum per radiogram 3 francs.

French Indo-China.—The coast stations, Fort Bayard and Kieu, are now open for service.

Morocco.—Casablanca coast station now furnishes compass bearings. Each bearing is subject to a tax of 6 francs.

Great Britain.—The legal time in Great Britain will be advanced from April 22 to September 16 this year.

AMENDMENTS TO REGULATIONS, BROADCASTING STATIONS.

DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, April 4, 1923.

Regulation 57, page 55, amended April 2, 1923, to read:

Class 2.—Limited commercial stations are not open to public service and are licensed for a specific commercial service or services defined in the license. Stations of this class must not transmit to or accept public messages from other stations. No rates are authorized.

Licenses of this class are required for all transmitting radio stations used for broadcasting news, music, lectures, church services, Government reports, and such matters, and do not permit the transmission of private or commercial communications.

The reading of telegrams or letters by broadcasting stations will not be construed as point-to-point communication so long as the signer is not addressed in person and so long as the text matter is of general interest.

Broadcasting stations must be operated by or under the supervision of an operator holding a commercial second-class license or higher; such operator must be on duty during the entire time the station is being operated.

No testing or experimenting is authorized in broadcasting stations between the hours of 10 a. m. and midnight, local standard time.

Broadcasting stations the operation of which interfere with the reception of time signals and meteorological information by marine service must remain silent while such signals are being transmitted.

Class A radiotelephone broadcasting stations.

Class A radiotelephone broadcasting station licenses will be issued to stations equipped to use power not exceeding 500 watts in the antenna and will be assigned a wave length between 222 meters (1,350 kilocycles) and 300 meters (1,000 kilocycles). Where more than one station of this class are licensed in the same city or locality a division of time will be required, if necessary.

Class B radiotelephone broadcasting stations.

A license will not be issued for a station in this class which does not comply in every respect with the specifications hereunder.

Specifications covering the requirements governing the construction, licensing, operating, and service of class B radiotelephone broadcasting stations:

Station.

Wave length.—The wave lengths between 300 and 345 and 375 and 545 meters only will be assigned for the use of stations of this class, which must be free from harmonics. Whenever necessary the use of a coupled circuit transmitter will be required. Hereafter but one wave length within these ranges, including the 400 meters wave length, will be assigned to any one locality.

Power.—The power supply must be dependable and nonfluctuating. The minimum required will be 500 watts in the antenna and the maximum shall not exceed 1,000 watts in the antenna.

Modulation.—The system must be so arranged as to cause the generated radio frequency current to vary accurately according to the sound impressed upon the microphone system.

Spare parts.—Sufficient tubes and other material must be readily available to insure continuity and reliability of the announced schedule of service.

Antenna.—The antenna must be so constructed as to prevent swinging.

Signaling system.—Some adequate and dependable system must be provided for communication between the operating room and the studio.

Studio.—The radio equipment in the studio must be limited to that essential for use in the room. The room shall be so arranged as to avoid sound reverberation and to exclude external and unnecessary noises.

Service.

Programs.—The programs must be carefully supervised and maintained to insure satisfactory service to the public.

Music.—The use of mechanically operated musical instruments is prohibited.

Division of time.—Where two or more stations of class B are licensed in the same city or locality a division of time will be required, if necessary.

Forfeiture of Class B privilege.

Licenses issued for the use of the wave lengths between 300 and 345 meters and 375 and 545 meters shall specifically provide that any failure to maintain the standards prescribed for such stations may result in the forfeiture of the class B privilege and relicensing of the station to use a wave length below 300 meters.

Class C radiotelephone broadcasting stations.

All radiotelephone broadcasting stations now licensed to use 360 meters (834 kilocycles) are placed in this class. No new licenses will be issued for stations to use this wave length. Renewal licenses for the use of 360 meters will be granted if desired.

REGULATIONS FOR BROADCASTING STATIONS.

The department has accepted the recommendations of the Second National Radio Conference, and immediate steps will be taken to put the plan into effect as far as found practicable.

The United States is divided into five zones with separate wave lengths designated for certain localities in each zone.

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Radio inspectors will notify the owners of all licensed class B stations of the wave length assigned for their locality under the new plan and advise those stations of this class who are not on 360 meters to make provisions to use the new wave length at the time specified. The new wave length must not be used for broadcasting prior to the date indicated. The use of the 400-meter wave length will not be permitted after May 15, 1923, except by the station to which this specific wave length is assigned under the new plan.

Hereafter all Government reports will be sent on the wave length assigned to the station, and the exclusive use of the 485-meter wave length will be discontinued for this service.

Stations now licensed to use 360 meters (now placed in class C) have the privilege of transferring to class A and using a wave length between 222 and 300 meters, which will be designated by the radio inspector, or, if they can qualify, transferring to class B and using the wave length designated for that locality within the band between 300 and 345 meters and 375 and 545 meters.

Where two or more stations of one class operate in the same city or locality a division of time will be required, if necessary.

VIOLATION OF ACT OF AUGUST 13, 1912, BY BROADCASTING STATIONS.

Under the reallocation of wave lengths plan effective May 15, 1923, it will be necessary for all transmitting radio stations to be accurately adjusted to the wave length specified in the license. Any variation from this rule may be considered a violation of section 2, act of August 13, 1912, justifying the revocation or suspension of the station license.

Beginning May 15 radio inspectors of each district will carefully check the transmitting wave lengths of stations in their districts by personal inspection of the stations as far as practicable and by listening in with accurately calibrated receivers and report to the department promptly any discrepancies observed.

The Bureau of Standards will transmit standard wave lengths from time to time which will be helpful in determining accurate wave lengths and will also listen in and check the wave lengths being used.

APRIL 27, 1923.

REGULATIONS AND SPECIFICATIONS GOVERNING THE LICENSING AND USE OF BROADCASTING DEVELOPMENT RADIO STATIONS.

Broadcasting development class.

To encourage scientific development of broadcasting and the apparatus used for this purpose, licenses of this class will be issued to owners of stations having transmitting and receiving equipment of their own design and manufacture provided in duplicate in all parts where, in the opinion of the Secretary of Commerce, failure is likely to occur. Such stations are to be used for the development and improvement of broadcasting, and to have adequate laboratory and manufacturing facilities and personnel with sufficient skill, training, and experience to insure progress in development work and the best obtainable quality of broadcasting.

All power radiated from the antenna of stations in this class shall be delivered to the antenna by means of coupled circuits, or such other means as will insure the same freedom from harmonics. The radiation must be sufficiently pure so that when tested by a sensitive receiver using a regenerative circuit with one tube and antenna at least 100 feet long and 30 feet high located 1 mile from the transmitter there shall be no evidence of any harmonic. Stations in this class will not be permitted to use power exceeding 1,000 watts in the antenna without special authority granted by the Secretary of Commerce.

Limited use of mechanically operated instruments will be permitted for test and development purposes only between the hours of 2 a. m. and 2 p. m.

Owners of stations in this class shall permit rebroadcasting of their programs by all other stations desiring to do so. The other stations will use the wave lengths assigned for their use. The development station will be equipped for transmitting and receiving special programs on such other wave lengths as may be designated for rebroadcasting by the Secretary of Commerce.

One or more radio operators holding commercial first-class licenses shall be on duty at the development station at all hours, maintaining a continuous watch, and required to render any assistance possible in an emergency in supplementing any existing pub-

No range competitions will be permitted where prizes or other valuable considerations are offered.

Licenses issued in this class shall specifically provide that the privileges authorized may be withdrawn whenever, in the opinion of the Secretary of Commerce, the station is not fully meeting all of the above specifications or such other regulations as may be made covering a station to be used for broadcasting development.

The wave length assigned to stations in this class will be changed immediately by the Secretary of Commerce whenever, in his opinion, the use of such wave length is not practical and such change is considered necessary.

D. B. CARSON,
Commissioner of Navigation.

Approved.

HERBERT HOOVER,
Secretary of Commerce.

LOADING COIL AND CONDENSERS FOR USE WITH SIMPLE RECEIVING SETS.

Bureau of Standards Circular 120, Construction and Operation of a Simple Home-made Radio Receiving Outfit, describes a simple type of crystal detector set which has an effective wave length range from about 200 to 600 meters. To receive longer waves, such as the time signals transmitted from Arlington on 2,650 meters, a loading coil may be used in connection with this set.

In Bureau of Standards Circular 137, which has recently appeared, there is given a description of a loading coil which, when used in connection with the set described in Circular 120, will permit the reception of waves up to about 3,000 meters. Many radio stations of considerable power operate on waves between 600 and 3,000 meters, and the use of this loading coil will therefore greatly increase the number of stations which it is possible to receive with this set.

In Circular 137 there is also given a description of a series-antenna condenser of fixed capacity and a by-pass condenser of fixed capacity to be connected in shunt with the telephone receivers. The use of the condenser in series with the antenna will improve reception on short wave lengths, such as 200 meters or shorter; the condenser here described has a capacity of about 300 micromicrofarads. The use of the telephone-shunt condenser will increase the intensity of signals received from some stations, particularly those using spark transmitting apparatus. The telephone-shunt condenser described has a capacity of about 1,500 micromicrofarads. Paraffined paper and tin foil are used in constructing these condensers.

Instructions are given for constructing and assembling the loading coil and the two condensers and for operating the receiving sets using these additional parts. The cost of the required material for the loading coil is about \$3, and for the two condensers about 80 cents.

The title of Bureau of Standards Circular No. 137 is Auxiliary Condensers and Loading Coil Used with Simple Homemade Radio Receiving Outfits. A copy of this circular may be purchased for 10 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C.

DECIMAL CLASSIFICATION OF RADIO SUBJECTS.

In organizations actively engaged in radio work, such as manufacturing, operating, or selling companies, and radio-research laboratories, and in large libraries, there is a real demand for a convenient and comprehensive method of classifying the considerable volume and variety of printed matter, books, specifications, drawings, references, and other radio material which is constantly accumulating. A good method of classification by subject makes it possible to place the material covering related subjects near together in the file or on the shelf, instead of arranging the material simply in the order in which the various items are received.

The only valuable knowledge is the available. To be available, it must be so classified that it can at once be found. It is often much easier to hunt up a desired fact anew than to search for it among a mass of material which is unclassified or poorly classified.

Several years ago the staff of the radio laboratory of the Bureau of Standards felt the need for a suitable classification in connection with its own work. After some trials it appeared that a decimal system of classification would be very useful for this purpose, and a detailed decimal classification of radio subjects has been prepared at the bureau.

Persons connected with library work are familiar with the Dewey decimal classification, which assigns a classification number according to subject to every book which

1876. The entire field of human knowledge is divided by the Dewey classification into nine main classes, and each main class is subdivided as minutely as may be required for the purpose of the particular library where it is used. It is flexible and can be easily adapted to any special requirements. It is convenient to have a special classification, such as a radio classification, so arranged that it will fit conveniently into a library where the Dewey classification is already in use. In the Dewey classification the number 621.384 represents radio communication, and the classification prepared at the Bureau of Standards is really a subdivision of this number. For the radio classification the abbreviation "R" is suggested to represent the number 621.384. Additions to the Bureau of Standards radio classification are occasionally made.

There has recently been issued Bureau of Standards Circular No. 138, A Decimal Classification of Radio Subjects—An Extension of the Dewey System. In the classification given in this publication the general field of radio communication is divided into nine main classes, each of which is subdivided as minutely as required. This classification is intended to be preeminently practical and to not sacrifice usefulness to any theoretical refinement.

This classification is used in classifying the references to current radio periodical literature which are printed in each issue of the RADIO SERVICE BULLETIN. Readers of the RADIO SERVICE BULLETIN will find it worth while to purchase a copy of this classification, since it will explain the significance of the numbers appearing before each reference in the list printed each month and considerably increase the usefulness of these reference lists. By selecting from the classification the numbers corresponding to the particular subjects in which he is interested a reader can quickly find in the reference list each month the references on those subjects. With a copy of the classification and a file of copies of the RADIO SERVICE BULLETIN available a person can therefore quickly locate the literature on a given radio subject.

In an organization in which only a comparatively small amount of material is to be classified it may be sufficient to use only the nine main classes, in which, for example, the number "R900" represents "Radio apparatus and equipment." In large organizations it may be desired to go into such detail, as "R342.2," which represents "Electron tube amplifiers using resistance coupling," or "134.45," "Principles of superregenerative action of electron tubes." An abbreviated classification is given which is suitable for organizations having a moderate amount of material to classify, and the alphabetical index makes it possible to readily refer to the classification number of any desired subject.

A copy of Bureau of Standards Circular No. 138 may be purchased for 10 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C.

REFERENCES TO CURRENT RADIO PERIODICAL LITERATURE.

The following list of references is 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. Abstracts and articles which are essentially of amateur or novice interest are not listed.

A complete file of the lists in mimeographed form, previous to August 1, 1922, can be consulted at the Bureau of Standards in Washington. Files of earlier lists can also be consulted at the Library of Congress in Washington, the Engineering Societies Library in New York, and the John Crerar Library in Chicago.

These references are classified according to a decimal system described in detail in Bureau of Standards Circular No. 138, A Decimal Classification of Radio Subjects—An Extension of the Dewey System. A copy of this publication may be purchased for 10 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C. A notice briefly describing this publication appears elsewhere in this issue.

In this list the subjects corresponding to the 10 principal classes of the radio classification are given, and preceding each reference is given a number which corresponds to the classification of the reference. The subjects corresponding to the various decimal divisions of the 10 principal classes are not given in these lists, but can be found in the classification given in Bureau of Standards Circular 138. In case a reference could properly be assigned to two or more of the numbers of the classification, it appears only once in this list, with the number corresponding to the subject in connection with which the reference is of greatest importance.

In this list, under the first eight principal classes the numbers assigned to the references are preceded by the letter "R," which is an abbreviation for the number 621.384 which is assigned to radio communication in the regular Dewey decimal classification. Under the class "R800—nonradio subjects," the numbers shown in this list are not preceded by an "R," but are the numbers assigned to the subject of the reference

The Bureau of Standards can not furnish copies of the various periodicals or other publications to which references are given. Copies of these publications may be secured from newsdealers or from publishers or may be consulted at libraries. Most United States Government publications to which references are given can be purchased at the prices stated from the Superintendent of Documents, Government Printing Office, Washington, D. C. Copies of United States patents can be secured for 10 cents each from the Commissioner of Patents, Washington, D. C.

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RADIO SIGNALS OF STANDARD FREQUENCY.

Radio signals of standard frequency will be transmitted from the Bureau of Standards at Washington, D. C. (station WWV), on the dates given below in May and June. These standard frequency signals are intended to be used for standardizing wave meters and adjusting transmitting and receiving apparatus. The proper adjustment of such apparatus is particularly important in connection with the reallocation of waves as recommended by the second radio conference held in Washington in March, 1923.

Methods for receiving and utilizing these signals for wave-meter calibration were published in the February issue of this bulletin; more detailed information may be obtained upon application to the Bureau of Standards. The announced values of these signals are accurate to better than three-tenths of 1 per cent. The schedule of these transmissions is given below.

Schedule of transmission.

Eastern standard time.	Signal.	Kilocycles (meters in parentheses).							
		May 1.	May 7.	May 11.	May 17.	May 23.	May 29.	June 4.	June 11.
11.00 to 11.04 p. m.	General call.....	400	400	900	200	75	1400	900	400
11.04 to 11.08 p. m.	Standard frequency...	(750)	(750)	(333)	(1499)	(3998)	(214)	(333)	(750)
11.08 to 11.11 p. m.	Announcements.....								
11.15 to 11.19 p. m.	General call.....	500	500	1000	250	100	1500	1000	500
11.19 to 11.23 p. m.	Standard frequency...	(600)	(600)	(300)	(1199)	(2998)	(200)	(300)	(600)
11.23 to 11.25 p. m.	Announcements.....								
11.30 to 11.34 p. m.	General call.....	600	600	1100	300	125	1600	1100	600
11.34 to 11.38 p. m.	Standard frequency...	(500)	(500)	(273)	(999)	(2999)	(187)	(273)	(500)
11.38 to 11.41 p. m.	Announcements.....								
11.45 to 11.49 p. m.	General call.....	700	700	1200	350	150	1700	1200	700
11.49 to 11.53 p. m.	Standard frequency...	(428)	(428)	(250)	(857)	(1099)	(176)	(250)	(428)
11.53 to 11.56 p. m.	Announcements.....								
12.00 to 12.04 a. m.	General call.....	800	800	1300	400	175	1900	1300	800
12.04 to 12.08 a. m.	Standard frequency...	(375)	(375)	(231)	(750)	(1714)	(167)	(231)	(375)
12.08 to 12.11 a. m.	Announcements.....								
12.15 to 12.19 a. m.	General call.....	900	900	1400	450	200	1900	1400	900
12.19 to 12.23 a. m.	Standard frequency...	(333)	(333)	(214)	(666)	(1499)	(158)	(214)	(333)
12.23 to 12.26 a. m.	Announcements.....								
12.30 to 12.34 a. m.	General call.....	1000	1000	1500	500	250	2000	1500	1000
12.34 to 12.38 a. m.	Standard frequency...	(300)	(300)	(200)	(600)	(1199)	(150)	(200)	(300)

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It should be especially noted that the above schedule lists the frequency in kilocycles and the wave lengths in meters, the latter being in parentheses. Wave length in meters is given by dividing 299820 by the number of kilocycles.

The "general call" is given by voice during the first half of the four-minute period and by continuous wave telegraph during the second half. This call is given to enable listeners to tune in WWV. The "standard frequency signals" consist of the call letters WWV (.--- -- .---) repeated with very long dashes intervening and are transmitted by unmodulated continuous waves. The "announcements" are made by voice during the first half of the period and by CW telegraphy during the latter half. The general call and the announcements are made on the same frequency as the standard frequency signals and may be used for some measurement purposes, but it is recommended that accurate measurements be made on the standard frequency signals only. With sensitive receiving apparatus it should be possible to receive these signals anywhere east of the Mississippi River.

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