RADIO SERVICE BULLETIN

U.S.
ISSUED MONTHLY BY BUREAU OF NAVIGATION (DEPARTMENT OF COMMERCE)

Washington, December 1, 1921—No. 56

CONTENTS.

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.
G. 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.
P =Private.
O =Government business exclusively.
Hours =Hours of operation:
N =Continuous service.
X =No regular hours.
m =a. m. (12m=midday).
s =p. m. (12s=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. of A. =Radio Corporation of America.
S. O. R. S. =Ship Owners Radio Service.
Co. =Company.
Corp. =Corporation.
& =And.

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2nd Set

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, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Chicago, Ill.[1]	KYW	300, 360, 500, *600*	PR	.....	Westinghouse Electric & Manufacturing Co.
Honolulu, Hawaii[2]	KYQ	*600*, 340	PR	X	Radio Shop.
Kenai, Alaska	KZZ	.....	PR	X	Leon C. Grove.

[1] Loc. O. 87° 37′ 20″ N. 41° 42′ 26″; range, 200; system, Westinghouse; hours, 8 a. m.-12 p. m.; rates, none.
[2] Loc. (approximately) O. 157° 52 00″, N. 21° 19′ 00″; range, 100; system, Clapp-Eastham and Deforest radiophone, 1000; rates, none.

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name of vessel.	Call signal.	Rates. North and South American service.	Rates. Transoceanic service.	Service.	Hours.	Owner of vessel.	Station controlled by—
		Cents.	*Cents.*				
Baton Rouge	KDVX	.....	.....	PG	X	Marietta Manufacturing Co.	Owner of vessel.
Bay State	KDVR	8	8	PG	N	United States Shipping Board.	S. O. R. S.
Centurion[1]	KDVZ	8	8	PG	X	Buffalo Bayou Co.	Owner of vessel.
Clifford F. Moll[3]	KDWA	.....	.....	PG	X	American Steamship Co.	Do.
Dixie Arrow	KDVT	8	8	PG	X	Standard Transportation Co.	R. C. of A.
H. M. Storey	KDVV	8	8	PG	X	Standard Oil Co.	
Jacob T. Kopp[2]	KDVS	.....	.....	PG	X	American Steamship Co.	Owner of vessel.
John J. Boland[3]	KDWB	.....	.....	PG	X	....do.....	Do.
King and Winge	KDVU	.....	.....	PG	X	National Independent Fisheries Co.	
Lolomi	KDWC	.....	.....	.....	.....	.....	
Memphis	KDVY	.....	.....	PG	X	Marietta Manufacturing Co.	Do.
Narwhal[3]	KDVP	4	.....	PG	X	Philip Shore	Do.
Steel Scientist	KDVW	8	8	PG	X	United States Steel Products Co.	

[1] Range, 300; system, Cutting & Washington, 1000; w. l., 300, 450, *600*.
[2] Range, 150; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, *600*; rates, Great Lakes service 2 c. per word.
[3] Range, 150; system, Wireless Specialty Apparatus Co., 1000; w. l., 300, *600*.

Commercial land and ship stations, alphabetically by call signals.

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

Call signal.	Name.	Call signal.	Name.
KYQ	Honolulu, Hawaii.....c	KDVV	H. M. Storey.....b
KYW	Chicago, Ill.....c	KDVW	Steel Scientist.....b
KZZ	Kenai, Alaska.....c	KDVX	Baton Rouge.....b
KDVP	Narwhal.....b	KDVY	Memphis.....b
KDVR	Bay State.....b	KDVZ	Centurion.....b
KDVS	Jacob T. Kopp.....b	KDWA	Clifford F. Moll.....b
KDVT	Dixie Arrow.....b	KDWB	John J. Boland.....b
KDVU	King and Winge.....b	KDWC	Lolomi.....b

Government ship stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Station controlled by—
Altair	NURJ	United States Navy.
Antares	NATB	Do.
Arctic	NAFR	Do.
Arcturus	NASJ	Do.
Argonne	NISX	Do.
Boreas	NALM	Do.
Canopus	NIRX	Do.
Capella	NAZK	Do.
Chaumont	NISV	Do.
Denebola	NIRZ	Do.
Procyon	NURF	Do.
Regulus	NASQ	Do.
Rigel	NURG	Do.
Sirius	NUPP	Do.
Spica	NURD	Do.
Vega	NAXM	Do.
Yukon	NAQD	Do.

NOTE.—All of the above Government vessels work on wave lengths of 300 and 600 meters, and are open to PG business.

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.	
NAFR	Arctic	b	NIRZ	Denebola	b
NALM	Boreas	b	NISV	Chaumont	b
NAQD	Yukon	b	NISX	Argonne	b
NASJ	Arcturus	b	NUPP	Sirius	b
NASQ	Regulus	b	NURD	Spica	b
NATB	Antares	b	NURF	Procyon	b
NAXM	Vega	b	NURG	Rigel	b
NAZK	Capella	b	NURJ	Altair	b
NIRX	Canopus	b			

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921.]

Station.	Call signal.	Wave lengths.	Station controlled by—
Atlanta, Ga	4XF	*200*, 275, 325, 340	Charles L. Pierce.
Atlanta, Ga	4XH	*200*, 275, 325, 340	H. E. Bussey.
Barnesville, Ohio	8ZAC	*200*, 375	Clifford H. Galloway.
Buena Vista, Va	3ZAA	*200*, 375	J. Frank Kay.
Buffalo, N. Y	8XAD	*200*, 375	Federal Telephone & Telegraph Co.
Grove City, Pa	8YV	*200*, 375	Grove City College.
Honolulu, Hawaii	6XAP	*200*, 340	Radio Shop.
Laredo, Tex	5ZAN	*200*, 375	Charles G. Clark.
Marietta, Ohio	8YAA	*200*, 375	Marietta College.
Mayville, N. Y	8ZAD	*200*, 375	Experimental Radio Association.
Northfield, Vt	1YD	*200*, 375	Norwich University.
Oakland, Calif	6XW	Variable.	Richard C. Tavers.
Orono, Me	1XAH	*200*, 475	University of Maine.
Philadelphia, Pa	3XAC	*200*, 340	Ship Owners Radio Service.
Richfield, Utah	6ZAJ	*200*, 375	M. S. Andelin.
Roanoke, Va	3ZAB	*200*, 375	Charles L. Zimmerman.
Toledo, Ohio	8XAC	*200*, 375	William B. Duck Co.
Yuma, Ariz	6ZAK	*200*, 375	Charles E. Blalack.

Special land stations, grouped by districts.

Call signal.	District and station.	Call signal.	District and station.
	First district:		Sixth district:
1XAH	Orono, Me.	6XAP	Honolulu, Hawaii.
1YD	Northfield, Vt.	6XW	Oakland, Calif.
	Third district:	6ZAJ	Richfield, Utah.
3XAC	Philadelphia, Pa.	6ZAK	Yuma, Ariz.
3ZAA	Buena Vista, Va.		Eighth district:
3ZAB	Roanoke, Va.	8XAC	Toledo, Ohio.
	Fourth district.	8XAD	Buffalo, N. Y.
4XF	Atlanta, Ga.	8YAA	Marietta, Ohio.
4XH	Do.	8YV	Grove City, Pa.
	Fifth district:	8ZAC	Barnesville, Ohio.
5ZAN	Laredo, Tex.	8ZAD	Mayville, 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, 1921, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

BROOKLYN, N. Y.—*Read* New York, N. Y.

FLAT ROCK, MICH.—W. l., 300, 385, *600*.

FRANKFORT, MICH.—Hours, 7 a. m.–12 (noon), 1–6 p. m., 7 p. m.–midnight; 1–6 a. m.

NEW LONDON, CONN.—Range, 150; system, composite, 480; w. l., 300, *600*.

NEW YORK, N. Y. (KDKF).—Range, 150; w. l., 300, 450, *600*.

ST. JAMES, N. Y.—Service PR.

SULZER, ALASKA.—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, 1921, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

ADMIRAL WAINRIGHT.—Name changed to AGNES DOLLAR.

AGWIDALE.—System, Navy-Marconi, 1000; w. l., 300, 450, *600*.

AGWIHAVRE.—Range, 200; system, I. W. T. Co., 1000; w. l., 300, 450, *600*.

AGWILAKE.—Range, 200; system, I. W. T. Co., 1000.

AGWIMARS.—Range, 200; system, I. W. T. Co., 1000.

AGWIMOON.—Range, 200; system, I. W. T. Co., 1000.

AGWISTAR.—W. l., 300, 450, *600*.

AGWISUN.—Range, 200; system, I. W. T. Co., 1000.

ALABAMA (WFB).—System, R. C. of A., 1000; hours, X.

ALASKA.—Strike out all particulars.

ALLIANCA.—Rates, North and South American services, 8 c. per word.

ANN ARBOR No. 3.—System, R. C. of A., 1000.

ANN ARBOR No. 4.—System R. C. of A., 1000.

ANN ARBOR No. 5.—System, R. C. of A., 1000.

ANN ARBOR No. 6.—System, R. C. of A., 1000.

ARCTURUS.—System, Navy-Liberty, 1000; w. l., 300, 450, *600*.

ARIZPA.—Range, 300; system, Navy–R. C. of A., 1000; w. l., 300, 450, *600*.

AUDITOR.—W. l., 300, 450, *600*.

BABINDA.—Ocean Motorship Co. owner of vessel.

BENOWA.—Ocean Motorship Co. owner of vessel.

BERKENHEAD (KDVL).—*Read* Birkenhead; station operated and controlled by R. C. of A.

BESSEMER.—W. l., 300, 450, *600*.

BLUE HEN STATE.—Range, 300; system, Navy, 1000; w. l., 300, 450, *600*.

BRYNHILDA.—Range, 150.
CALAVERAS.—System, Navy-Marconi, 1000; w. l., 300, 450, *600*.
CANOGA.—Range, 300; system, Navy-Kilbourne & Clark, 1000.
CAPILLO.—Range, 300; system, Navy, 1000; w. l., 300, 450, *600*.
C. A. SNIDER.—Union Sulphur Co. owner of vessel.
CELESTIAL.—Range, 300; system, Federal arc; w. l., 300, *600*, 1800.
CELILO.—Range, 200; system, Gray & Danielson, 240.
CETHANA.—Ocean Motorship Co. owner of vessel.
CHALLAMBA.—Ocean Motorship Co. owner of vessel.
CHAPPAQUA.—Range, 300.
CHARLES BRALEY.—Range, 200.
CHATTANOOGA CITY.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, *600;* rates, North and South American and transoceanic services, 8 c. per word.
CHINAMPA.—Strike out all particulars.
CITY OF FAIRBURY.—System, Navy-Wireless Specialty Apparatus Co., 1000.
CITY OF FLINT.—Station operated and controlled by R. C. of A.
CITY OF FREEPORT.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, *600*.
CLONTARF.—Station operated and controlled by R. C. of A.
CODY.—Range, 300; system, Navy-Liberty, 1000; w. l., 300, 450, *600*.
COLD SPRING.—Range, 200; system, Navy-R. C. of A., 1000; w. l., 300, 450, *600;* hours, X.
COMERANT.—Strike out all particulars.
COOK.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, *600*.
COOLCHA.—Ocean Motorship Co. owner of vessel.
COQUINA.—Range, 150; system, Navy-Marconi, 1000.
COLORADO SPRINGS.—Range, 200; system, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, *600*.
CORNELIA.—Rates, North and South American services, 8 c. per word.
CULBURRA.—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 450, *600;* station operated and controlled by owner of vessel.
DAKOTAN.—Range, 300; w. l., 300, 450, *600;* rates, North and South American and transoceanic services, 8 c. per word.
DELAVAN.—Range, 300; system, Navy, 1000; w. l., 300, 450, *600*.
DELLWOOD.—Strike out all particulars.
DE SOTO.—Strike out all particulars.
DIRIGO.—System, Navy-Lowenstein, 1000.
EDGEWOOD.—Strike out all particulars.
EDITH.—System, I. W. T. Co., 1000.
FAITH (KJOA).—Strike out all particulars.
F. D. ASCHE.—System, R. C. of A., 1000; w. l., 300, *600*.
FELTORE.—Range, 150; system R. C. of A., 1000; Guaranty Trust Co., owner of vessel.
F. H. HILLMAN.—Station operated and controlled by R. C. of A.
FINLAND.—Range, 300; system, Marconi, 1000; w. l., 300, 450, *600;* rates, North and South American and transoceanic services, 8 c. per word.
FLORIDA (KUS).—Strike out all particulars.
FORT SEWARD.—System, Navy-Kilbourne & Clark, 1000.
GALVESTON.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 450, *600*.
GENE CRAWLEY.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, *600*.
GOREE.—System, Navy-Marconi, 1000; w. l., 300, 450, *600*.
GOVERNOR COBB.—Range, 150; system, R. C. of A., 1000.
GRATIA.—Range, 300; rates, North and South American services, 4 c. per word.
GREAT FALLS.—Range, 200; system, International Radio Telegraph Co., 1000; w. l., 300, 450, *600*.
HADDON.—Range, 300; system, Navy-Liberty, 1000; w. l., 300, 450, *600*.

HANOVER.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, *600*.
HARTFORD.—Range, 300; system, Navy-Marconi, 1000; w. l. 300, 450, *600*.
HARVESTER.—Range, 200; system, I. W. T. Co., 1000.
HENRY M. FLAGLER.—Range, 150; system, R. C. of A., 1000.
HENRY R. MALLORY.—Range 300.
HERMAN WINTER.—Strike out all particulars.
H. F. DIMOCK.—Strike out all particulars.
HOLLYWOOD.—Station operated and controlled by R. C. of A.
HOXBAR.—Range, 300; system, Navy-Marconi, 1000; hours, X.
H. T. HARPER.—Station operated and controlled by R. C. of A.
INDEPENDENCE HALL.—Range, 300; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, *600*.
IOWAN.—Range, 150; w. l., 300, 450, *600;* rates, North and South American services, 8 c. per word.
IPSWICH.—System, Navy 1000; rates, North and South American and transoceanic services, 8 c. per word.
JACKSON.—Range, 300; system, Navy, 1000; w. l., 300, 450, *600*.
JACKSONVILLE.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 450, *600*.
JEFF DAVIS.—Range, 300; system, Federal arc; w. l., 300, *600*, 1800; rates, North and South American and transoceanic services, 8 c. per word.
J. L. LUCKENBACH.—Name changed to PRINCESS; Rupert Wry, owner of vessel.
JOHN D. ARCHBOLD.—Range, 300; system, R. C. of A., 1000.
JOSEPH SEEP.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, *600*.
JOSIAH MACY.—W. l., 300, *600*.
KANAWHA.—Range, 200; system, Marconi, 1000.
LAKE AKKRA.—W. l., 300, 450, *600*.
LAKE BRIDGE.—Name changed to LAKEBRIDGE.
LAKE CANAVERAL.—System, Navy, 1000; w. l., 300, 450, *600*.
LAKE DUNMORE.—Range, 200.
LAKE FARISTELL.—W. l., 300, 450, *600*.
LAKE FURLOUGH.—W. l., 300, 450, *600*.
LAKE GRAMPIAN.—W. l., 300, 450, *600*.
LAKE INAHA.—W. l., 300, 450, *600*.
LAKE LIDA.—System, Navy-Simon, 1000; w. l., 300, 450, *600*.
LAKE PEPIN.—Range, 200; system, Navy-Marconi, 1000; w. l., 300, 450, *600*.
LAKE TREBA.—Range, 200; system, Navy-Simon, 1000.
LARAMIE.—Range, 300; system, Navy, 1000; w. l., 300, 450, *600*.
LEBANON.—Strike out all particulars.
LIBERTY BELL.—Range, 300; system, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, *600*.
LIO.—Range, 300; system, Federal arc; w. l., 300, *600*, 1800.
LIVINGSTONE ROE.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, *600*.
LUBRICO.—Range, 300; system, Federal arc; w. l., 300, *600*, 1800.
MALDEN.—Strike out all particulars.
MARY.—Range, 200 system, Navy-Simon, 1000; w. l., 300, 450, *600*.
MASSICK.—Range, 300; system, Navy-Wireless Improvement Co., 1000; w. l., 300, 450 *600*.
MASSILLON BRIDGE.—W. l., 300, 450, *600*.
MATTOLE.—Range, 300; system, Navy-Liberty, 1000; w. l., 300, 450, *600;* hours, X.
MCKEESPORT.—W. l., 300, 450, *600;* hours, X.
MEHANNO.—Strike out all particulars.
MILWAUKEE BRIDGE.—W. l., 300, *600*.
MINNESOTAN.—Range, 300; w. l., 300, 450, *600;* rates, North and South American services, 8 c. per word

MONOMAC.—W. l., 300, 450, *600*.
MONTEREY.—Range, 300.
MONTGOMERY.—System, Navy-R. C. of A., 1000; w. l., 300, 450, *600*.
MONTROLITE.—W. l., 300, 450, *600*.
MUNDALE.—W. l., 300, *600*.
NARBO.—Range, 300; system, Federal arc, w. l., 300, *600*, 1800.
NEDMAC.—Strike out all particulars.
NILE.—System, Navy-Marconi, 1000; w. l., 300, 450, *600*.
NODDLE ISLAND.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, *600*.
NOURMAHAL.—Range, 150; system, R. C. of A., 1000; rates, North and South American and transoceanic services, 8 c. per word.
OSCODA.—System, Navy-Marconi, 1000.
PARKSVILLE.—Range, 300; system, Navy-Liberty, 1000; w. l., 300, 450, *600*.
PATRICIA.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, *600;* rates, North and South American and transoceanic services, 8 c. per word.
PAWTUCKET.—W. l., 300, 450, *600*.
PERE MARQUETTE 17.—System, R. C. of A., 1000.
PERE MARQUETTE 18.—System, R. C. of A., 1000.
PERE MARQUETTE 19.—System, R. C. of A., 1000.
PERE MARQUETTE 20.—System, R. C. of A., 1000.
PINE TREE STATE.—Station operated and controlled by S. O. R. S.
PITTSBURGH BRIDGE.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, *600*.
PRESIDENT.—Range, 150; system, R. C. of A., 1000; w. l., 300, 550, *600*.
PROVIDENCE.—System, R. C. of A., 250.
REPUBLIC.—Range, 300; system, Cutting & Washington, 1000; w. l., 300, 450, *600*.
ROBERT E. HOPKINS.—Range, 300; system, R. C. of A., 1000; w. l., 300, *600;* rates, North and South American and transoceanic services, 8 c. per word; station operated and controlled by R. C. of A.
SALUDA.—Strike out all particulars.
SAMUEL L. FULLER.—Range, 300; system, R. C. of A., 1000.
SAMUEL Q. BROWN.—Station operated and controlled by R. C. of A.
SAN JOSE.—Range, 200; w. l., 300, *600*.
SANTANTA.—System, Clapp-Eastham, 1000.
SANTIAGO.—Range, 150; hours, X.
SANTINO.—Strike out all particulars.
SARCOXIE.—System, Navy-Wireless Specialty Apparatus Co., 1000; w. l., 300, 450, *600*.
SCHOHARIE.—System, Navy, 1000; w. l., 300, 450, *600*.
SCHUYLKILL BRIDGE.—Range, 300; system, Navy-Marconi, 1000; w. l., 300, 450, *600*.
SEAFARER.—Strike out all particulars.
SENECA.—Strike out all particulars
SEVERANCE.—Range, 150.
SHAUME.—Strike out all particulars.
SHORTSVILLE.—System, Navy-Marconi, 1000.
SINGLETON PALMER.—Strike out all particulars.
STANDARD (KIC).—Range, 300.
STEEL INVENTOR.—Range, 300; system, R. C. of A., 1000; hours, X.
STEEL SEAFARER.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, *600;* station operated and controlled by R. C. of A.
STORM KING (KDJM).—Rates, North and South American services, 8 c. per word.
TAMIAHUA.—Range, 300; system, Kilbourne & Clark, 1000; w. l., 300, 450, *600;* rates, North and South American and transoceanic services, 8 c. per word; station operated and controlled by owner of vessel.
TANAMO.—Rates, North and South American services, 8 c. per word.

THEODORE F. REYNOLDS.—Range, 150; system, Cutting & Washington, 1000; w. l., 300, 450, *600;* rates, North and South American and transoceanic services, 8 c. per word.

THOMAS P. BEAL.—Range, 300; system, Navy-Simon, 1000; station operated and controlled by owner of vessel.

TOTECO.—Range, 300; system, Cutting & Washington, 1000; w. l., 300, 450, *600;* rates, North and South American services, 8 c. per word; station operated and controlled by Cutting & Washington Radio Corp.

TUSCALOOSA CITY.—System, R. C. of A., 1000.

TUXPANOIL.—Range, 300; system, Federal arc, w. l., 300, *600*, 1800.

VANADA.—System, Navy-Marconi, 1000; w. l., 300, 450, *600.*

VIRGINIAN.—Range, 300.

WEST CARUTH.—W. l., 300, 450, *600.*

WEST CHETAC.—W. l., 300, 450, *600;* hours, X.

WEST COHAS.—Call signal KNAE.

WESTERN COMET.—System, Navy-Marconi, 1000; w. l., 300, 450, *600;* hours, X.

WM. ROCKEFELLER.—Station operated and controlled by R. C. of A.

YAMHILL.—Strike out all particulars.

YAQUINA.—Strike out all particulars.

YUCATAN.—Range, 150; w. l., 300, *600.*

The rate for both, North and South American and transoceanic services for the following-named vessels, which are operated and controlled by the Independent Wireless Telegraph Co., is 8 c. per word, effective January 1, next:

Agwibay [1]
Agwihavre
Agwilake
Agwimars
Agwimex
Agwimoon
Agwisea
Agwismith
Agwistar
Agwistone
Agwisun
Agwiworld
Alabama (WRAE)
Aryan
Beatrice
Brabant
Cananova
Cape Romain
Carolyn
Cascade
Cayo Mambi
Clare
Cretan
Currier
Director
Dirigo
Dorchester
E. C. Pope
Edith
Essex
Evelyn
Georgia (KUR)
Glendoyle
Gloucester
Grecian
Gulfcoast
Gulfking
Gulfland
Gulflight
Gulfoil
Gulf Prince
Gulf Queen
Gulf Star
Gulf Stream
Gulf Trade
Harvester
Helen
Hilton
Howard
Illinois (KDSZ)
Jean
J. M. Guffey
Juniata (KQJ)
Kershaw
Kingfisher
Laborer
Lake Fischer
Liebre
Lightburne
Ligonier
Louisiana
Margaret (KZO)
Maruba
Merrimack
Millinocket
Nantucket
New York (KUW)
Nika
Occidental
Oconee
Ontario
Pennsylvania
Persian
Quantico
Reaper
Roanoke
Robert P. Clark
Ruth
Sagua
Senator Bailey
Shenandoah
Shenango
Solitaire
Tanamo
Texas
Theordore F. Reynolds [1]
Trinidadian
Tuscan
Virginia
Winifred
Yuma

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDIS, *read* Lakebridge; KDVL, *read* Birkenhead; KGT, *read* Princess; WSF, *read* Agnes Dollar; strike out all particulars following the call signals, KDJW, KEGQ,

[1] Not reported before as being operated and controlled by I. W. T. Co.

KEN, KENF, KICM, KILQ, KIQM, KIXL, KJOA, KNI, KPV, KRY, KSC, KUBZ, KUDJ, KUMQ, KUS, KZV, WDAO, WPL, WVIE, WWS.

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, 1921.]

BAR HARBOR, ME.—Rates, effective January 1, next, ship service 10 c. per word.

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, 1921.]

ALBATROSS.—Strike out all particluars.
ARCTURUS.—Strike out all particulars.
FISH HAWK.—Strike out all particulars.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signals, NCO, NFV, and NQY.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

AUBURN, ALA. (5XA).—W. l., *200*, 250, 375.
CAMBRIDGE, MASS. (1XM).—W. l., 150, *200*, 400, variable.
CHICAGO, ILL. (9XG).—W. l., 375, variable.
COLLEGE STATION, TEX. (5XB).—W. l., *200*, 375, 500.
GREEN HARBOR, MASS. (1XD).—W. l., 325 to 450.
NEW YORK, N. Y. (2XD).—*Read* Hoboken, N. J.
PORTLAND, OREG. (7XF.)—W. l., *200*, 375, 450, 550.
PROVIDENCE, R. I. (1XF).—Strike out all particulars.
SCHENECTADY, N. Y. (2XA).—W. l., 260, 290, variable.
WOODSIDE, N. Y. (2XAC).—W. l., *200*, 250, 350, 400.

MISCELLANEOUS.

USE OF DIRECTION FINDER ON SHIPBOARD.

The Radio Service Bulletin, No. 54, October 1, 1921, contains an article describing the construction and operation of a simple type of direction finder for use on shipboard. It was not made clear in this article that the results obtained by using such a crudely constructed apparatus, which had not been accurately calibrated and carefully installed, could not be expected to give the same degree of accuracy or satisfaction as one carefully constructed, accurately calibrated, and properly installed. Anyone familiar with navigation will appreciate the advantage of a precision instrument.

WARNING TO AMATEURS.

The Bureau has received a number of complaints recently of amateur stations using wave lengths in excess of those authorized in their licenses which has resulted in much unnecessary interference. Amateurs should, if possible, have their wave lengths measured to avoid violating the law.

Attention is invited to the 15th regulation, section 4, act of August 13, 1912, and the penalties provided in this section, following the 19th regulation on page 13, Radio Laws and Regulations.

It has also been reported that a number of amateur stations are using more power than necessary, which is a violation of the 14th regulation, section 4, act of August 13, 1912. The penalties noted above apply to violations of this character.

BROADCASTING SERVICE.

Applicants for radio-station licenses desiring to use their stations for broadcasting market reports and weather forecasts should submit with their application a letter from the Chief, Bureau of Markets, or the Chief of the Weather Bureau, indicating that this service is desired.

NEW LIST OF STATIONS.

The 1921 list of Commercial and Government Radio Stations of the United States, which includes special land stations, is now ready for distribution. This publication can be procured from the Superintendent of Documents, Government Printing Office, Washington, D. C., price 15 cents per copy. The additions and alterations to this publication begin in the Radio Service Bulletin for August, last.

The 1921 list of Amateur Radio Stations of the United States is expected to be ready for distribution about the middle of December. This publication may be procured also from the address given above; price, 15 cents per copy.

Remittances for these publications should *not* be forwarded to the Bureau of Navigation, Department of Commerce.

INCREASE IN RATES.

Beginning January 1, next, the Independent Wireless Telegraph Co. has been authorized to charge 8 cents per word for all vessels operated and controlled by them.

The naval radio station at Bar Harbor, Me., will charge 10 cents per word for ship service, effective January 1, next.

LICENSES SUSPENDED.

First-class license No. 21814, issued at Norfolk, Va., June 26, 1920, has been suspended for a period of three months, on account of the holder of the license having violated article 6 of the international convention service regulations.

LIGHT, ALMIRANTE RADIO STATION, PANAMA.

Information has been received that a 1,000-watt electric light has been established on the radio tower at Almirante, in (approximately) lat. 9° 17′ 30″ N., long. 82° 22′ 54″ W., at a height of 393 feet above water. The light is pointed directly at Toro Point Light at Bocas del Toro, bearing 70°.—*From Hydrographic Bulletin, November 23, 1921.*

RADIO COMPASS STATION, VINGA ISLAND, SWEDEN.

Vinga Island radio compass station, in (approximately) lat. 57° 38′ 00″ N., long. 11° 36′ 10″ E., controlled by the coast station Gothenberg, is now in operation. Bearings are furnished free on 600-meter wave length. No responsibility is assumed for inexact information. Further notice will be given.—*From Hydrographic Bulletin, November 23, 1921.*

MODULATION PHENOMENA IN RADIOTELEPHONY.

The apparatus now used for transmission in radiotelephony uses three-electrode electron tubes as an essential part of the equipment, with the exception of a few high-power stations which use high-frequency alternators. The development of small and comparatively inexpensive radiotelephone transmitting equipment has been made possible only by the rapid development of the electron tube. The use of radiotelephony is now being rapidly extended, and it is being used for the broadcasting of news of different kinds, such as weather and market reports.

In radiotelephony a wave of a radio frequency such as a million cycles per second is varied in amplitude or "modulated" at audible frequencies such as 1,000 cycles per second, in accordance with the wave form of the sound which is being transmitted. The device by which this modulating process is accomplished must respond instantaneously to the variations of the impressed sound wave, and must therefore have negligible inertia, in order that sound may be transmitted without distortion. The electron tube is a device which answers these requirements, since the electron stream will respond instantaneously to variations in the audio-frequency wave. The phenomena occurring in circuits for modulating radio-frequency currents may become very complex, and require careful study. Three principal methods of modulation in electron tube radiotelephone transmitting sets are recognized: First, by variable absorption of the output power of a generator of radio-frequency current, as by inserting a microphone in the antenna circuit; second, by varying at speech frequencies the operating grid voltage of a tube generating radio-frequency current; third, by varying at speech frequencies the input plate voltage of a tube generating radio-frequency current. The third method is often referred to as "plate modulation," and is the method used in commercial and military types of apparatus in the United States. Plate modulation is superior to the other methods in many respects.

Studies have been made at the Bureau of Standards of the phenomena of modulated radio-frequency waves, and the relative advantages of different methods of modulation and different circuits. The apparatus used in radiotelephone transmitting sets employing plate modulation has been analyzed as consisting of four units—the source of direct current, the modulator unit, the generator unit, and the radiator unit. Oscillographic studies have been made. Results of these studies are contained in a publication of the Bureau of Standards just issued, Scientific Paper No. 423, Operation of the Modulator Tube in Radiotelephone Sets, by E. S. Purington. Copies may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 10 cents. Persons desiring information regarding radiotelephony will find this paper of considerable interest.—*Submitted by Bureau of Standards, November 22, 1921.*

REPORT ON WAR WORK OF THE BUREAU OF STANDARDS.

During the war the Bureau of Standards was engaged in many different kinds of work in research, testing, and practical development in many different fields. Much of this work was done for the various branches of the military and naval services, but important work was also done for other branches of the Government, and along lines useful in many commercial industrial processes. In the field of radio communication some of the more important work included the practical development of a coil antenna for use on submarines, consisting of a single turn of wire the ends of which were attached to the metallic hull of the vessel; the development of the direction finder for particular military purposes, including its use in aviation; the use of the coil antenna for transmitting; the preparation of radio publications for special military purposes; the testing in considerable numbers of electron tubes for the Government; research and development work on electron tubes and radiotelephony, with particular reference to military applications; the development of a number of important methods of making radio measurements; the construction of a cathode-ray oscillograph and the development of methods for its use; and an extensive investigation of the properties at radio frequencies of electrical insulating materials used in radio work. The radio investigations formed only a comparatively small part of the work done by the Bureau during the war. The activities of the Bureau embraced nearly every field of scientific and industrial investigation which possessed military application. A few fields which may be mentioned are electric batteries, optical glass, aeronautical instruments, aeronautical power plants, apparatus for locating guns by sound ranging, photography, and signaling by invisible radiations.

The Bureau has recently published a report summarizing its work during the war. This report, which consists of 300 pages and is illustrated with many photographs, will be found of considerable interest by any person having scientific or engineering interests. This report is designated as War Work of the Bureau of Standards, Miscellaneous Publication No. 46 of the Bureau of Standards. A copy may be purchased for 70 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C.—*Submitted by Bureau of Standards, November 30, 1921.*

RENEWAL OF COMMERCIAL OPERATOR'S LICENSES.

Referring to regulation 153, governing renewal license, application for renewal of commercial operator's license can be made by mail when it is inconvenient to apply in person. Applicants should request the nearest radio inspector to furnish two copies of Form 756, which should be submitted in duplicate with the expired license.

SPECIAL STATIONS USING 300 AND 600 METERS.

It has come to the attention of this Bureau that operators of special land stations are using the commercial wave lengths of 300 and 600 meters for purposes other than allowed under regulations 42 and 44. This constitutes a violation of the law, and operators are cautioned against the indiscriminate use of these wave lengths.

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