DEPARTMENT OF COMMERCE

RADIO DIVISION

RADIO SERVICE BULLETIN

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CONTENTS

ABBREVIATIONS AND SYMBOLS

The necessary corrections to the list of Commercial and Government 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. W=west longitude. N=north latitude. S=south latitude. E=east longitude.
Call.	=Call signal (letters) assigned.
Type.	=Type of wave classified as follows: A1=continuous wave (tube), A, arc=continuous wave, A2=interrupted continuous wave, A3=phone, B=spark.
Fy.	=Frequency in kilocycles; normal frequency in italics; wave length in meters in parenthesis.
Service	=Nature of service maintained: FX=point-to-point (fixed service), PG=general public (ship to shore), PR=limited public, RG=radio compass, FA=aeronautical station, AB=aviation beacon, RF=directional radiobeacon (ship work), P=private, O=Government business exclusively.
Hours	=Hours of operation: N=continuous service, X=no regular hour, Y=sunrise to sunset.
Accounts	=Message accounts settled by.
F. T. Co.	=Federal Telegraph Co.
I. R. T. Co.	=Intercity Radio Telegraph Co.
I. W. T. Co	=Independent Wireless Telegraph Co.
M. R. T. Co.	=Mackay Radio & Telegraph Co.
R. C. A.	=Radio Corporation of America.
R. M. C. A.	=Radiomarine Corporation of America.
T. R. T. Co.	=Tropical Radio Telegraph Co.
C. w.	=Continuous wave.
I. c. w.	=Interrupted continuous wave.
A. c.	=Alternating current.
V. t.	=Vacuum tube.
M. a.	=Meters-amperes.
U. S. L.	=Applies only to the list of Commercial and Government Radio Stations of the United States.
Δ	=Equipped with a radio compass (direction finder).

NEW STATIONS

Commercial land stations, alphabetically, by names of stations

[Additions to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1928, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

Station	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Station controlled by—
Albuquerque, N. Mex.[1]	KGSD	2,482 (120.87), 3,460 (86.7), 5,690 (52.72), 6,410 (46.8).	FX-P	X	Western Air Express.
Amarillo, Tex.[1]	KGSE	do	FX-P	X	Do.
Ashfork, Ariz.[1]	KGSZ	do	FX-P	X	Do.
Austin, Tex.[1]	KGSJ	do	FX-P	X	Do.
Barstow, Calif.[1]	KGSY	do	FX-P	X	Do.
Berkeley, Calif.[2]	KSW	1,712 (175.23)	FX-P	X	Berkeley Police Department.
Chatham, Alaska [1]	KGIN	179 (1,676), 191 (1,571), 428 (700), 500 (600).	FX-P	X	New England Fish Co.
Chicago, Ill.[1]	WMDA	2,482 (120.87), 3,460 (86.7), 5,690 (52.72), 6,410 (46.8).	FX-P	X	Western Air Express.
Clovis, N. Mex.[1]	KGTC	do	FX-P	X	Do.
Dallas, Tex.[1]	KGSK	do	FX-P	X	Do.
Del Rio, Tex.[1]	KGSL	do	FX-P	X	Do.
El Paso, Tex.[1]	KGSM	do	FX-P	X	Do.
Excursion Inlet, Alaska.[2]	KGIS	428 (700), 454 (660), 500 (600)	FX-PR	X	Pacific American Fisheries.
Flagstaff, Ariz.[1]	KGSG	2,482 (120.87), 3,460 (86.7), 5,690 (52.72), 6,410 (46.8).	FX-P	X	Western Air Express.
Fort Worth, Tex.[1]	KGSN	do	FX-P	------	Do.
Gallup, N. Mex.[1]	KGTB	do	FX-P	X	Do.
Hollbrook, Ariz.[1]	KGTA	do	FX-P	X	Do.
Houston, Tex.[1]	KGSO	do	FX-P	X	Do.
Hydaburg, Alaska [1]	KGIP	179 (1,676), 191 (1,571)	FX-PR	Y	Far North Fisheries (Inc.).
Kansas City, Mo.[1]	KGTG	2,482 (120.87), 3,460 (86.7), 5,690 (52.72), 6,410 (46.8).	FX-P	X	Western Air Express.
Lordsburg, N. Mex.[1]	KGSP	do	FX-P	X	Do.
Marfa, Tex.[1]	KGSQ	do	FX-P	X	Do.
Muskogee, Okla.[1]	KGSW	do	FX-P	X	Do.
Needles, Calif.[1]	KGTE	do	FX-P	X	Do.
Nelsmoor, Alaska [3]	KGIY	2,320 (129.3)	FX-P	X	Aleutian Livestock Co.
Oakland, Calif.[1]	KGSB	2,482 (120.87), 3,460 (86.7), 5,690 (52.72), 6,410 (46.8).	FX and FA-P.	X	Western Air Express.
Oklahoma City, Okla.[1]	KGSC	do	FX-P	X	Do.
Plainfield, Ill.[1]	WKDE	5,900 (50.85)	FX-PR	N	Universal Wireless Communications Co.
Phoenix, Ariz.[1]	KGSI	2,482 (120.87), 3,460 (86.7), 5,690 (52.72), 6,410 (46.8).	FX-P	X	Western Air Express.
Prince of Wales Island, Alaska.[1]	KGIT	179 (1,676), 191 (1,571)	FX-P	X	Starr-Collinson Packing Co.
Pueblo, Colo.[1]	KGSR	2,482 (120.87), 3,460 (86.7), 5,690 (52.72), 6,410 (46.8).	FX-P	X	Western Air Express.
St. Louis, Mo.[1]	KGST	do	FX-P	X	Do.
San Antonio, Tex.[1]	KGSS	do	FX-P	X	Do.
San Diego, Calif.[1]	KGSX	do	FX-P	X	Do.
Scobeyville, N. J.[1]	WKDA	5,885 (50.975)	FX-PR	N	Universal Wireless Communications Co.
Sweetwater, Tex.[1]	KGSU	2,482 (120.87), 3,460 (86.7), 5,690 (52.72), 6,410 (46.8).	FX-P	X	Western Air Express.
Tenakee, Alaska [1]	KFD	179 (1,676), 428 (700)	FX-P	X	Superior Packing Co.
Tucson, Ariz.[1]	KGSF	2,482 (120.87), 3,460 (86.7), 5,690 (52.72), 6,410 (46.8).	FX-P	X	Western Air Express.
Umnak, Alaska [3]	KGIU	2,320 (129.3)	FX-P	X	Aleutian Livestock Co.
Unalaska, Alaska [3]	KGIV	do	FX-P	X	Do.
Wichita, Kans.[1]	KGTD	2,482 (120.87), 3,460 (86.7), 5,690 (52.72), 6,410 (46.8).	FX-P	X	Western Air Express.
Wichita Falls, Tex.[1]	KGSV	do	FX-P	X	Do.
Williams, Ariz.[1]	KGSA	do	FX-P	X	Do.
Winslow, Ariz.[1]	KGTF	do	FX-P	X	Do.
Yuma, Ariz.[1]	KGSH	do	FX-P	X	Do.

[1] Type, A1. [2] Type, A2. [3] Type, A1 and A3.

Commercial ship stations, alphabetically by names of vessels

[Additions to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1928, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

Name of vessel	Call signal	Rates (cents)	Service	Hours	Owner of vessel	Message accounts settled by—
Anna Helen	WRBB				Dr. William F. Good	Owner.
Aztec	WJDL	8	PG	X	Albert C. Burrage	R. M. C. A.
Barron F.[1]	WIDS		P	X	Nakat Packing Co	Owner.
Bull S. S. Co., A. H.—general call for any or all vessels.	WABS				A. H. Bull S. S. Co	Do.
Delight [2]	KQOE	8	PG	X	James Griffiths & Sons	R. M. C. A.
Dwight F. Davis	WJDE				Inland Waterways Corporation	Owner.
Eleu	WJDH					
E. P. Co. No. 4 [3]	WIDY		P	X	Farwest Fisheries (Inc.)	Do.
Evangeline	WIDW				Deep Water Fish & Exploration Co.	
Farwest [3]	WIDX			X	Farwest Fisheries (Inc.)	Do.
George W. Mead	WJDD		PG	X	Newaygo Tug Line	
Glendoyle	KFAO	8	PG	X	Glendoyle S. S. Corporation	R. M. C. A.
Hazel Robb [1]	WIDR		P	X	Nakat Packing Corporation	Owner.
Helen Whittier	KJAO	8	PG	X	Los Angeles S. S. Co	R. M. C. A.
Ida Mae	WJDI		P	X	Farwest Fisheries (Inc.)	Owner.
Jitney	WJDA	6	PG	X	do	Do.
Lone Star	WJDG	8	PG	X	George G. Bourne	R. M. C. A.
Mary Ellen [3]	WIDZ		P	X	Farwest Fisheries (Inc.)	Owner.
Migrant	WJDF	8	PG	X	Carll Tucker	R. M. C. A.
Nan B.[1]	WIDV		P	X	Alaska Pacific Salmon Corporation	Owner.
Pacific Oak	KEZN	8	PG	X	Dimon S. S. Corporation	R. M. C. A.
Resource	WIDP				Reno Marine Salvage Co	
Rudolf N.[1]	WIDQ		P	X	Nakat Packing Corporation	Owner.
Sacco [1]	WIDT		P	X	do	Do.
Sage Brush	WJDJ	8	PG	X	Shepard S. S. Co	R. M. C. A.
Seven Seas	WJDC				English Uppercu	
Shenango [4]	WJDB		PG	X	Shenango Furnace Co	Do.
Tally Scow [1]	WIDU		P	X	Nakat Packing Corporation	Owner.
Wind Rush	WJDK	8	PG	X	Shepard & Morse Lumber Co	R. C. M. A.
Yaka	KDDF	8	PG	X	U. S. S. B	

[1] Type, A3; fy., 2,320 (129.3).
[2] Type, B; fy., 375 (800), 410 (730), 425 (705), 454 (660), 500 (600).
[3] Type, A1; fy., 2,320 (129.3).
[4] Type, A2; fy., 375 (800), 394 (760), 410 (730), 425 (705).

Commercial land and ship stations, alphabetically, by call signals

[a, aeronautical station; b, ship station; c, coast station; f, fixed station]

Call signal	Name of station		Call signal	Name of station	
KDDF	Yaka	b	KGTB	Gallup, N. Mex	f
KEZN	Pacific Oak	b	KGTC	Clovis, N. Mex	f
KFAO	Glendoyle	b	KGTD	Wichita, Kans	f
KFD	Tenakee, Alaska	f	KGTE	Needles, Calif	f
KGIN	Chatham, Alaska	f	KGTF	Winslow, Ariz	f
KGIP	Hydaburg, Alaska	f	KGTG	Kansas City, Mo	f
KGIS	Excursion Inlet, Alaska	f	KJAO	Helen Whittier	b
KGIT	Prince of Wales Island, Alaska	f	KQOE	Delight	b
KGIU	Umnak, Alaska	f	KSW	Berkeley, Calif	f
KGIV	Unalaska, Alaska	f	WABS	Bull S. S. Co., A. H.—general call for any or all vessels	b
KGIY	Nelsmoor, Alaska	f	WIDP	Resource	b
KGSA	Williams, Ariz	f	WIDQ	Rudolf N	b
KGSB	Oakland, Calif	f and a	WIDR	Hazel Robb	b
KGSC	Oklahoma City, Okla	f	WIDS	Barron F	b
KGSD	Albuquerque, N. Mex	f	WIDT	Sacco	b
KGSE	Amarillo, Tex	f	WIDU	Tally Scow	b
KGSF	Tucson, Ariz	f	WIDV	Nan B	b
KGSG	Flagstaff, Ariz	f	WIDW	Evangeline	b
KGSH	Yuma, Ariz	f	WIDX	Farwest	b
KGSI	Phoenix, Ariz	f	WIDY	E. P. Co. No. 4	b
KGSJ	Austin, Tex	f	WIDZ	Mary Ellen	b
KGSK	Dallas, Tex	f	WJDA	Jitney	b
KGSL	Del Rio, Tex	f	WJDB	Shenango	b
KGSM	El Paso, Tex	f	WJDC	Seven Seas	b
KGSN	Fort Worth, Tex	f	WJDD	George W. Mead	b
KGSO	Houston, Tex	f	WJDE	Dwight F. Davis	b
KGSP	Lordsburg, N. Mex	f	WJDF	Migrant	b
KGSQ	Marfa, Tex	f	WJDG	Lone Star	b
KGSR	Pueblo, Colo	f	WJDH	Eleu	b
KGSS	San Antonio, Tex	f	WJDI	Ida Mae	b
KGST	St. Louis, Mo	f	WJDJ	Sage Brush	b
KGSU	Sweetwater, Tex	f	WJDK	Wind Rush	b
KGSV	Wichita Falls, Tex	f	WJDL	Aztec	b
KGSW	Muskogee, Okla	f	WKDA	Scobeyville, N. J	f
KGSX	San Diego, Calif	f	WKDE	Plainfield, Ill	f
KGSY	Barstow, Calif	f	WMDA	Chicago, Ill	f
KGSZ	Ashfork, Ariz	f	WRBB	Anna Helen	b
KGTA	Hollbrook, Ariz	f			

Commercial aircraft stations, alphabetically, by names of craft

[Additions to the List of Radio Stations of the United States, edition of June 30, 1928, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Station	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Owner
NC9606	KHDA	333 (900), 375 (800), 393 (763), 400 (750), 414 (725), 420 (715), 457 (656), 2,344 (128).			Transcontinental Air Transport.
NC9607	KHDB	do			Do.
NC9643	KHDC	do			Do.
NC9644	KHDD	do			Do.
NC9645	KHDE	do			Do.
NC9646	KHDF	do			Do.
NC9647	KHDG	do			Do.
NC9648	KHDH	do			Do.
NC9649	KHDI	do			Do.
NC9650	KHDJ	do			Do.
NC9651	KHDK	do			Do.
NC9652	KHDL	do			Do.
NC9653	KHDM	do			Do.
NC9654	KHDN	do			Do.
NC9655	KHDO	do			Do.
NC9656	KHDP	do			Do.
NC9657	KHDQ	do			Do.
NC9658	KHDR	do			Do.
NC9659	KHDS	do			Do.
NC9660	KHDT	do			Do.

The type of emission for all the above-named aircraft stations is A3.

Commercial aircraft stations, alphabetically, by call signals

Call signal	Name of station	Call signal	Name of station	Call signal	Name of station	Call signal	Name of station	Call signal	Name of station
KHDA	NC9606	KHDE	NC9645	KHDI	NC9649	KHDM	NC9653	KHDQ	NC9657
KHDB	NC9607	KHDF	NC9646	KHDJ	NC9650	KHDN	NC9654	KHDR	NC9658
KHDC	NC9643	KHDG	NC9647	KHDK	NC9651	KHDO	NC9655	KHDS	NC9659
KHDD	NC9644	KHDH	NC9648	KHDL	NC9652	KHDP	NC9656	KHDT	NC9660

Government land stations, alphabetically, by names of stations

[Additions to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1928, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Station	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Owner
Boise, Idaho [1]	KCR	2,972 (100.94), *3,370 (89)*, 3,394 (88.4), *5,940 (50.51)*	FA and FX		Department of Commerce, Bureau of Lighthouses.
Boston, Mass. [1]	WSX	201 (1,493), *230 (1,304)*, *3,370 (89)*, 3,394 (88.4), 4,071 (73.7), *5,940 (50.51)*	FA and FX		Do.
Fort Monmouth (Long Branch), N. J. [2]	WLY	150 (2,000) to 5,100 (58.82)	FX		U. S. Army.
La Grande, Oreg. [1]	KCS	2,962 (101.3), *3,370 (89)*, 4,065 (73.8), *5,940 (50.51)*	FA and FX		Department of Commerce, Bureau of Lighthouses.

[1] Type, A1.
[2] Loc. 74° 02′ 00″ W., 40° 19′ 00″ N.; type, A1, A2, and A3; hours, 9 a. m. to 4 p. m.

Government ship stations, alphabetically, by names of stations

[Additions to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1928, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Station	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Owner
Kittiwake	WTDG		O	X	Department of Commerce, Bureau of Fisheries.

Government land and ship stations, alphabetically, by call signals

[a, aeronautical station; b, ship station; f, fixed station; c, coast station]

Call signal	Name of station	Call signal	Name of station
KCR	Boise, Idaho---fa and fx	W8X	Boston, Mass---f and a
KCS	La Grande, Oreg---a and fx	WTDG	Kittiwake---b
WLY	Fort Monmouth (Long Branch), N. J.--f		

Special stations, alphabetically, by names of stations

[Additions to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1928]

Station	Call signal	Frequency in kilocycles, meters in parentheses	Power (watts)	Owner
California: Beverly Hills.	W6XAH	1,604 (187.03), 2,398 (125.1), 3,256 (92.5), 4,795 (62.57), 6,425 (46.7), 8,650 (34.68).	1,000	Fox Film Corporation.
Massachusetts: Somerville.[1]	W1XB	1,604 (187.03), 2,100 (142.9) to 2,200 (136.4), 2,398 (125.1), 2,750 (109.1) to 2,850 (105.3), 3,256 (92.5), 4,795 (62.57), 6,425 (46.7), 8,650 (34.68), 12,850 (23.35), 17,300 (17.341).	500	General Industries Co., 63 Gorham Street.
Michigan: Utica	W8XB	1,608 (186.57), 2,302 (130.32), 3,076 (97.529), 4,108 (73.028), 6,155 (48.74).	500	C. H. Vincent.
New Jersey:				
Boonton	W3XW	3,076 (97.5), 6,155 (48.74)	50	Aircraft Radio Corporation, Rockaway Valley Airport.
Kearney [2]	W2XCX	6,080 (49.34)	500	L. Bamberger & Co.
Washington:				
Cashmere	W7XAT	101 (2,970)	7,000	Electro-Spray Corporation.
Wenatchee	W7XAS	101 (2,970)	7,000	Do.
Aircraft: X7654	W8XC	1,608 (186.57), 2,302 (130.32), 4,108 (73.028), 8,650 (34.68).	75	Packard Motor Car Co.

[1] Experimental and visual broadcasting.
[2] Relay broadcasting.

Special stations, grouped by districts

Call signal	District and station	Call signal	District and station
W1XB	First district: Somerville, Mass.		Seventh district:
W2XCX	Second district: Kearney, N. J.	W7XAS	Wenatchee, Wash.
W3XW	Third district: Boonton, N. J.	W7XAT	Cashmere, Wash.
W6XAH	Sixth district: Beverly Hills, Calif.		Eighth district:
		W8XB	Utica, Mich.
		W8XC	X7654 (aircraft).

ALTERATIONS AND CORRECTIONS

COMMERCIAL LAND STATIONS

[Alterations and corrections to be made to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1928, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

ALABAT, P. I. (Tayabas), radio.—Hours, ship service, 20–30 of each hour.

ALLENTOWN, PA.—Type, A1, A2, and A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5); hours, 8 a. m. to 5 p. m. daily, except Sunday.

ALPENA, MICH., radio (WGI).—Fy., drop 190 (1,578), 3,051 (98. 3); add 174 (1,724).

ALPENA, MICH. (WNO).—Fy., 163 (1,840).

APARRI, P. I. (Cagayan), radio.—Hours, ship service, 20–30 of each hour.
BALABAC, P. I. (Palawan), radio.—Ship service, 40–50 of each hour.
BALANGIGA, P. I. (Samar), radio.—Ship service, 30–40 of each hour.
BALTIMORE, MD. (WEQ).—Type, A1, A2, and A3; fy., 1,712 (175.23).
BANDINI, CALIF.—Call changed to KGTI.
BASCO, P. I. (Batanes), radio.—Hours, see note at foot of this list.
BATANGAS, P. I. (Batangas), radio.—Hours, see note at foot of this list.
BAYTOWN TEX.—Fy., 438 (685), 500 (600).
BEAUMONT, TEX.—Type, A1, A2, and B; fy., 438 (685), 500 (600).
BIRMINGPORT, ALA.—Type, A2 and B; fy., 169 (1,775), 274 (1,095), 3,420 (87.7), 6,515 (46.05).
BOLINAS, CALIF. (KKQ).—Owner, R. C. A. Communications (Inc.).
BONGAO, P. I. (Sulu), radio.—Hours, ship service, 40–50 of each hour.
BORONGAN, P. I. (Samar), radio.—Hours, ship service, 10–20 of each hour.
BRADENTON, FLA.—Fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
BUFFALO, N. Y., radio (WAM).—Type, A2; fy., drop 153.1 (1,960), 170 (1,764), add 165 (1,818), 171 (1,754).
CALIFORNIA, portable (KRB).—Fy., 3,250 (92.3), 4,244 (70.7), 5,365 (55.92), 8,810 (34.05), 10,010 (29.97).
CALIFORNIA, portable (KRN).—Fy., 3,250 (92.3), 4,244 (70.7), 5,365 (55.92), 8,810 (34.05), 10,010 (29.97).
CATANAUAN, P. I. (Tayabas), radio.—Hours, ship service, 30–40 of each hour.
CATBALOGAN, P. I. (Samar), radio.—Hours, ship service, 0–10 of each hour.
CEBU, P. I., radio.—Hours, see note at foot of this list.
CEDAR FALLS, WASH.—Type, A1 and A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
CEIBA, P. R., radio.—Type, A1, A2, and A3; fy., add 174 (1,724), 438 (685), 2,320 (129.3), 5,765 (52.03).
CHARLEROI, PA.—Type, A2 and A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5); hours, N.
CHEBOYGAN, MICH.—Fy., 171 (1,754).
CHICAGO, ILL.—Fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
CLEARWATER, CALIF. (Los Angeles), radio (KOK).—Fy., 418 (720), 500 (600).
CLEVELAND, OHIO, radio (WTK).—Type, A2; fy., 165 (1,818), 171 (1,754).
CLEVELAND, OHIO (WTL).—Type, A2; fy., 165 (1,818), 171 (1,754), 4,116 (72.9), 8,630 (34.76); hours, N.
COLUMBUS, OHIO (WCL).—Type, A2; fy., 165 (1,818), 171 (1,754).
CONNELLSVILLE, PA.—Type, A1, A2, and A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5); hours, N.
CULION, P. I. (Palawan), radio.—Hours, ship service, 20–30 of each hour.
CUMBERLAND, MD.—Type, A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
CUYO, P. I. (Palawan), radio.—Hours, ship service, 10–20 of each hour.
DALLAS, TEX. (KUP).—Type, A2; fy., 1,712 (175.23).
DAPA, P. I. (Surigao), radio.—Hours, ship service, 10–20 of each hour.
DAPITAN, P. I. (Zamboanga), radio.—Hours, ship service, 10–20 of each hour.
DARLINGTON, MD. (near).—Type, A1, A2, and A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
DAVAO, P. I. (Mindinao), radio.—Hours, ship service, 40–50 of each hour.
DAYTONA BEACH, FLA.—Fy., 3,160 (94.9), 1,366 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
DEARBORN, MICH. (WAV).—Fy., 163 (1,840), 174 (1,724); service, P; hours, N.
DETROIT, MICH. (WBM).—Type, A1, A2, and A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
DETROIT, MICH., radio (WDI).—Type, A2; fy., drop 153.1 (1,960), add 165 (1,818), 171 (1,754).
DULUTH, MINN., radio (WME).—Type, A2; fy., 143 (2,098), 165 (1,818), 171 (1,754), 410 (730), 425 (705), 454 (660); hours, 8 a. m. to 8 p. m.
EVERETT, WASH., radio.—Type, A1 and B; fy., 143 (2,098), 163 (1,840), 460 (652), 500 (600), 182.82 (1,641).
FIFTH RADIO ZONE, portable (KHP).—Hours, 9 a. m. to 7 p. m., daily except Sunday.
FIFTH RADIO ZONE, portable (KHS).—Hours, 9 a. m. to 7 p. m., daily except Sunday.
FIFTH RADIO ZONE, portable (KHW).—Hours, 9 a. m. to 7 p. m., daily except Sunday.

FIFTH RADIO ZONE, portable (KHZ).—Hours, 9 a. m. to 7 p. m., daily except Sunday.
FORDSON, MICH.—Fy., 2,452 (122.35).
FORT LAUDERDALE, FLA.—Fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
FORT PIERCE, FLA.—Fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
FRACKVILLE, PA.—Type, A1, A2, and A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5); hours, 8 a. m. to 5 p. m. daily, except Sunday.
FRANKFORT, MICH., radio.—Fy., 174 (1,724), 410 (730), 425 (705); hours, N.
HARRISBURG, PA. (WBA).—Type, A1.
HAZLETON, PA.—Type A1, A2, and A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5); hours, 8 a. m. to 5 p. m. daily, except Sunday.
HILO, HAWAII.—Fy., 442 (680), 4,212 (71.2), 5,720 (52.45).
HINATUAN, P. I. (Surigao), radio.—Hours, ship service, 30–40 of each hour.
HONOLULU, HAWAII (KOG).—Loc. (approximately) 157° 37′ 30″ W., 21° 15′ 00″ N.; fy., 406 (740), 4,212 (71.2), 4,455 (67.34), 4,004 (74.9), 5,840 (51.37).
HOQUIAM, WASH.—Type, A2; fy., 460 (652), 500 (600); service, PG; hours, 7 a. m. to 7 p. m.; rates, 10 cents per word.
ISABELA DE BASILAN, P. I. (Zamboanga), radio.—Service, FX–PR; hours, strike out ship service.
JERSEY CITY, N. J.—Fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
JOHNSWOOD, MICH.—Type, A1 and A3; fy., 171 (1,754).
KAUMAPALAPAN, HAWAII.—Fy. 3,332 (90).
KAUNAKAKAI, HAWAII, (Maui).—Type, A2; fy., 442 (680), 4,212 (71.2), 4,455 (67.34), 5,720 (52.45).
LAKE CITY, FLA.—Fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
LAKELAND, FLA.—Fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
LAS VEGAS, NEV.—Call changed to KGTJ.
LEGASPI, P. I., radio.—Hours, see note at foot of this list.
LIHUE, HAWAII (Kauai).—Type, A2; fy; 4,212 (71.2), 5,720 (52.45).
LONE PINE, CALIF.—Changed to Independence, Calif.; loc. 118° 12′ 00″ W., 36° 48′ 20″ N.; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
LOS ANGELES, CALIF. (KRM).—Fy., 3,250 (92.3), 4,244 (70.7), 5,365 (55.92), 8,810 (34.05), 10,010 (29.97).
LOUISIANA, portable (WFG).—Hours, 9 a. m. to 7 p. m. daily except Sundays.
LOUISIANA, portable (WFH).—Hours, 9 a. m. to 7 p. m. daily except Sundays.
LOUISIANA, portable (WFJ).—Hours, 9 a. m. to 7 p. m. daily except Sundays.
LOUISIANA, portable (WFS).—Hours, 9 a. m. to 7 p. m. daily except Sundays.
LUDINGTON, MICH., radio.—Type, A1 and A2; fy., 174 (1,724), 410 (730), 425 (705).
MACKINAC ISLAND, MICH., radio.—Type, A2 and B; fy., 191 (1,571), 410 (730), 425 (705), 454 (660).
MALABANG, P. I. (Mindanao), radio.—Hours, ship service, 20–30 of each hour.
MALITA, P. I. (Davao), radio.—Hours, ship service, 50–60 of each hour.
MAMBAJO, P. I., radio.—Hours, ship service, 20–30 of each hour.
MANISTIQUE, MICH., radio.—Fy., 174 (1,724), 410 (730), 425 (705).
MANITOWOC, WIS., radio.—Fy., 174 (1,724), 410 (730), 425 (705).
MATI, P. I. (Davao), radio.—Hours, ship service, 0–30 of each hour.
MEMPHIS, TENN.—Type, A2; fy., 274 (1,095), 6,515 (46.05); hours, N.
MENOMINEE, MICH., radio.—Fy., 174 (1,724), 410 (730), 425 (705); hours, 7.30 to 9 p. m. additional for FX service.
MIAMI, FLA.—Fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
MINNEAPOLIS, MINN. (KQP).—Fy., 274 (1,095), 3,420 (97.7), 6,515 (46.05).
MINNEAPOLIS, MINN. (WLP).—Type, A1; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
MISSISSIPPI, portable (WFM).—Hours, 9 a. m. to 7 p. m. daily except Sundays.
MISSISSIPPI, portable (WFN).—Hours, 9 a. m. to 7 p. m. daily except Sundays.
MISSISSIPPI, portable (WFP).—Hours, 9 a. m. to 7 p. m. daily except Sundays.
NEWARK, N. J.—Fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).

NEW YORK, N. Y., radio (WSF).—Loc. 74° 00′ 23″ W., 40° 42′ 43″ N.; fy., 131 (2,290), 143 (2,098), 418 (720), 500 (600).
OKLAHOMA, portable (KNL).—Hours, 9 a. m. to 7 p. m. daily except Sundays.
OKLAHOMA, portable (KNM).—Hours, 9 a. m. to 7 p. m. daily except Sundays.
OKLAHOMA, portable (KNQ).—Hours, 9 a. m. to 7 p. m. daily except Sundays.
OKLAHOMA, portable (KNY).—Hours, 9 a. m. to 7 p. m. daily except Sundays.
OKLAHOMA, portable (KNZ).—Hours, 9 a. m. to 7 p. m. daily except Sundays.
OKLAHOMA, portable (KOD).—Hours, 9 a. m. to 7 p. m. daily except Sundays.
PALATKA, FLA.—Fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
PANDAN, P. I. (Catanduanes Islands), radio.—Hours, ship service, 10–20 of each hour.
PASAY, P. I., radio.—Service, FX–PR; hours, no ship service.
PHILADELPHIA, PA. (WJV).—Type, A1, A2, and A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
PORTLAND, OREG. (KLB).—Type, A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5), hours, N.
PUERTO PRINCESA, P. I. (Palawan), radio.—Hours, ship service, 0–10 of each hour.
PUNTA GORDA, FLA.—Fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
QUINCY, MASS.—Type, A1 and A2; fy., 438 (685), 500 (600).
ROGERS, MICH., radio.—Type, A2; fy., 165 (1,818), 171 (1,754), 410 (730), 425 (705), 4,116 (72.9), 8,630 (34.76); rates, 6 cents per word.
SACRAMENTO, CALIF. (KRJ).—Fy., 3,250 (92.3), 4,244 (70.7), 5,365 (55.92), 8,810 (34.05), 10,010 (29.97).
ST. AUGUSTINE, FLA.—Fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
ST. CROIX FALLS, WIS.—Fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
SALT LAKE CITY, UTAH (KRP).—Call changed to KGTH.
SANFORD, FLA.—Fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
SAN FRANCISCO, P. I. (Camotes-Cebu), radio.—Hours, ship service 10–20 of each hour.
SAN FRANCISCO, CALIF.—Mills Field (KVA).—Call changed to KGTK; fy., 2,482 (120.87), 3,460 (86.7), 5,690 (52.72), 6,410 (46.8).
SAN FRANCISCO, CALIF. (KRG).—Fy., 3,250 (92.3), 4,244 (70.7), 5,365 (55.92), 8,810 (34.05), 10,010 (29.97).
SAN JOSE, CALIF.—Fy., 3,250 (92.3), 4,244 (70.7), 5,365 (55.92), 8,810 (34.05), 10,010 (29.97).
SAYVILLE, N. Y. (WML).—Fy., 6,815 (44.02), 6,875 (43.64), 7,655 (39.09), 7,662.5 (38.65), 7,670 (39.11), 7,730 (38.81), 7,737.5 (38.78), 7,745 (38.74), 7,752.5 (38.7), 7,760 (38.66), 8,075 (37.15), 8,710 (34.44), 8,850 (33.9), 8,970 (33.44), 8,980 (33.41), 8,990 (33.37), 9,070 (33.08), 9,290 (32.29), 10,170 (29.5), 10,490 (28.6), 10,810 (27.75), 10,820 (27.73), 10,830 (27.7), 10,890 (27.55), 13,000 (23.08), 13,015 (23.05), 13,030 (23.02), 13,750 (21.82), 13,960 (21.49), 14,680 (20.44), 14,695 (20.415), 14,710 (20.39), 14,725 (20.375), 14,740 (20.35), 14,755 (20.335), 14,770 (20.31), 17,140 (17.503), 17,420 (17.222), 17,660 (16.988), 17,680 (16.968), 17,700 (16.949), 18,260 (16.429), 18,780 (15.974), 19,540 (15.253), 19,560 (15.337), 19,580 (15.322), 19,600 (15.306), 19,620 (15.291), 19,740 (15.198), 20,300 (14.778), 20,980 (14.299), 21,380 (14.032).
SAYVILLE, N. Y., radio (WSL).—Type, A arc, A1, and A2; fy., 107 (2,804), 143 (2,098), 392 (765), 500 (600).
SEATTLE, WASH., radio (KPE).—Type, A arc, A1, A2, and B; fy., 143 (2,098), 163 (1,840), 167 (1,796), 410 (730), 454 (660).
SEATTLE, WASH. (KVW).—Fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
SEBASTOPOL, CALIF.—Fy., 3,250 (92.3), 4,244 (70.7), 5,365 (55.92), 8,810 (34.05), 10,010 (29.97).
SHEBOYGAN, WIS., radio.—Type, A2; fy., 171 (1,754), 410 (730), 425 (705); hours, 7 a. m. to 12 noon, and 1 to 6 p. m., daily; 8 to 11 a. m. and 4 to 6 p. m., Sundays and holidays; owner, C. Reiss Coal Co.
SIASI, P. I. (Sulu), radio.—Hours, ship service 20–30 of each hour.
SKAGIT POWER SITE, WASH.—Changed to Rockport, Wash. (near); type A1 and A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).

SOGOD, P. I. (Leyte), radio.—Hours, ship service 50–60 of each hour.
SPRINGDALE, PA.—Type, A2 and A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
SURIGAO, P. I. (Surigao), radio.—Hours, ship service 0–10 of each hour.
TAMPA, FLA., radio.—Type, A2 and B; fy., 438 (685), 500 (600), 5,525 (54.3), 8,630 (34.76).
TANDAG, P. I. (Surigao), radio.—Hours, ship service 20–30 of each hour.
TEXAS AND LOUISIANA, portable (KOZ).—Change to Texas, Louisiana, and New Mexico, portable; hours, 9 a. m. to 7 p. m., daily except Sundays.
Texas and Louisiana, portable (KPF).—Change to Texas, Louisiana, and New Mexico, portable.
TEXAS AND LOUISIANA, portable (KPL).—Change to Texas, Louisiana, and New Mexico, portable.
TEXAS AND LOUISIANA, portable (KPU).—Change to Texas, Louisiana, and New Mexico, portable.
TEXAS AND LOUISIANA, portable (KRR).—Change to Texas, Louisiana, and New Mexico, portable.
TEXAS AND LOUISIANA, portable (KRS).—Change to Texas, Louisiana, and New Mexico, portable.
TEXAS AND LOUISIANA, portable (KRT).—Change to Texas, Louisiana, and New Mexico, portable.
TEXAS AND LOUISIANA, portable (KRV).—Change to Texas, Louisiana, and New Mexico, portable.
TEXAS AND LOUISIANA, portable (KRW).—Change to Texas, Louisiana, and New Mexico, portable.
TEXAS AND LOUISIANA, portable (KRZ).—Change to Texas, Louisiana, and New Mexico, portable.
TEXAS AND LOUISIANA, portable (WCS).—Change to Texas, Louisiana, and New Mexico, portable.
TEXAS, portable (KNS).—Hours, 9 a. m. to 7 p. m. daily, except Sunday.
TEXAS, portable (KNT).—Hours, 9 a. m. to 7 p. m. daily, except Sunday.
TEXAS, portable (KNU).—Hours, 9 a. m. to 7 p. m. daily, except Sunday.
TEXAS, portable (KOF).—Hours, 9 a. m. to 7 p. m., daily except Sunday.
TEXAS, portable (KOI).—Hours, 9 a. m. to 7 p. m. daily, except Sunday.
TEXAS, portable (KOT).—Hours, 9 a. m. to 7 p. m. daily, except Sunday.
THIRD RADIO ZONE, portable (WFY).—Hours, 9 a. m. to 7 p. m. daily, except Sunday.
THIRD RADIO ZONE, portable (WFZ).—Hours, 9 a. m. to 7 p. m. daily, except Sunday.
THIRD RADIO ZONE, portable (WGB).—Hours, 9 a. m. to 7 p. m. daily, except Sunday.
UNDERWOOD, WASH. (near).—Type, A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5); hours, N.
VIEQUES, P. R.—Fy., 52 (5,768), 174 (1,724), 438 (685), 500 (600), 1,610 (186.3), 2,320 (129.3), 5,765 (52.03).
VIRAC, P. I. (Albay).—Hours, ship service 20–30 of each hour.
WAHIAWA, HAWAII (Oahu), radio.—Fy., 131 (2,290), 143 (2,098), 410 (730), 454 (660), 500 (600), 6,645 (45.15).
WAILUKU, HAWAII.—Type, A2; fy., 442 (680), 4,212 (71.2), 5,720 (52.45).
WASHINGTON, D. C. (WJH).—Type, A1, A2, and A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
WASHINGTON, D. C. (WJX).—Type, A1, A2, and A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
WAYNOOKA, OKLA.—Correct orthography, Waynoka, Okla.
WEST DOVER, OHIO (Cleveland), radio.—Fy., 143 (2,098), 161 (1,863), 410 (730), 425 (705), 454 (660), 4,775 (62.82), 8,570 (35.01).
WEST PALM BEACH, FLA. (WNG).—Fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
WILLIAMSPORT, MD.—Type, A3; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5).
WILLIAMSPORT, PA.—Type, A1; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5); hours, 8 a. m. to 5 p. m. daily, except Sunday.
WILSONVILLE, PA.—Type, A1; fy., 3,160 (94.9), 3,166 (94.8), 3,172 (94.6), 3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5); hours, 8 a. m. to 5 p. m., daily, except Sunday.
ZAMBOANGA, P. I. (Mindanao), radio.—Hours, see note at foot of this list.

Strike out all particulars of the following-named stations: Detroit, Mich. (WCZ); Fort Worth, Tex.; Highland Park, Mich.; Ponce, P. R.; Reedville, Va., San Juan, P. R. (WDY).

NOTE.—Observes day and night ship schedules. Continues listening-in on a frequency of 500 (600) for ship traffic and SOS (distress) signals from the time all land-station traffic is cleared until the opening hour of the next business day.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY, BY NAMES OF VESSELS

[Alterations and corrections to be made to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1928, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

ADMIRAL PEOPLES.—Accounts, owner.
ALOMA.—Name changed to Enchantress; owner, Aymar Johnson.
AMERICAN FARMER.—Owner, United States Lines.
BUCCANEER.—Fy., 375 (800), 410 (730), 425 (705), 3,436 (87.3), 4,148 (72.32).
CALIFORNIA (WMCM).—Type, A arc, A1 and A2; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 425 (705), 469 (640), 500 (600), 5,525 (54.3), 8,290 (36.19), 8,390 (35.76), 11,170 (26.86), 11,260 (26.64), 12,490 (24.02), 12,550 (23.9); hours, N.
CITIES SERVICE TOLEDO.—Accounts, M. R. T. Co.
DEFIANCE.—Accounts, R. M. C. A.
EASTERN PLANET.—Fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 425 (705), 500 (600).
ECUADOR.—Type, A1 and A2; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600).
ELEANOR BOLING.—Type, A2; fy., 375 (800), 425 (705), 500 (600), 3,142 (95.48), 4,755 (63.11), 5,525 (54.3), 5,645 (53.14), 6,575 (45.62), 8,670 (34.6), 11,290 (26.57), 12,820 (23.4), 16,700 (17.964), 21,820 (13.749); service, P.
ELENA.—Type, A1 and A2; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600); service, PG; hours, X.
EXILONA.—Type, B; fy., 375 (800), 410 (730), 425 (705), 454 (660), 500 (600).
FLORIDIAN.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
GALVESTON.—Accounts, R. M. C. A.
GATEWAY CITY.—Accounts, R. M. C. A.
GULFBIRD.—Type, A1 and A2; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600).
GULFPRIDE.—Fy., add 125 (2,400), strike out 410 (730), 454 (660).
HALO.—Fy., 125 (2,400), 131 (2,290), 135 (2,222), 137 (2,190), 141 (2,128), 143 (2,098), 149 (2,013), 151 (1,987), 153 (1,961), 160 (1,875), 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
HEREDIA.—Fy., 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 153 (1,961), 160 (1,875), 375 (800), 400 (750), 425 (705), 454 (660), 469 (640), 500 (600), 3,428 (87.51), 5,525 (54.3), 8,490 (35.34), 11,230 (26.71).
HILDA.—Type, A1 and A2; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600); accounts, M. R. T. Co.
INVINCIBLE.—Type, A arc and B; fy., 125 (2,400), 131 (2,290), 133 (2,256), 135 (2,222), 137 (2,190), 139 (2,158), 141 (2,128), 143 (2,098), 145 (2,069), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 425 (705), 500 (600).
JOHN A. TOPPING.—Fy., 375 (800), 410 (730), 425 (705).
JOSEPH H. FRANTZ.—Fy., 375 (800), 410 (730), 425 (705).
LA PERLA.—Type, A1, A2, and B; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 147 (2,041), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600).

LEVIATHAN.—Fy., 131 (2,290), 133 (2,256), 135 (2,222), 137 (2,190), 139 (2,158), 141 (2,128), 143 (2,098), 145 (2,069), 147 (2,041), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 425 (705), 500 (600), 8,350 (35.93), 8,450 (35.5), 11,140 (26.93), 12,370 (24.25), 12,520 (23.96), 12,820 (23.4); owner, United States Lines.

LURLINE.—Name changed to Chirikof.

MARJ III.—Fy., 375 (800), 410 (730), 425 (705); service, PG; accounts R. C. A.

MARY PINCHOT.—Accounts, R. M. C. A.

MEANTICUT.—Fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 425 (705), 500 (600).

METAPAN.—Fy., 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 147 (2,041), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600).

MITCHELL.—Accounts, R. M. C. A.

MOSELLA.—Fy., 125 (2,400), 131 (2,290), 133 (2,256), 135 (2,222), 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 160 (1,875), 375 (800), 425 (705), 500 (600).

MUNAMAR.—Fy., strike out 125 (2,400).

NORTHWESTERN.—Accounts, M. R. T. Co.

NOSA KING.—Accounts, R. M. C. A.

OSSINING.—Accounts, R. M. C. A. (U. S. L.).

PASTORES.—Fy., 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 147 (2,041), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600).

PAWLET.—Name changed to Golden Wall.

POINT ARENA.—Accounts, M. R. T. Co.

POINT BONITÁ.—Accounts, M. R. T. Co.

POINT FERMIN.—Accounts, M. R. T. Co.

POINT MONTARA.—Accounts, M. R T. Co.

POINT SUR.—Accounts, M. R. T. Co.

RELIEF.—Owner, Merritt, Chapman & Scott Corporation.

SANTA MARTA.—Fy., 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 147 (2,041), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600).

SENATOR.—Accounts, R. M. C. A.

SHADOW.—K.-Type, A1; fy., 500 (600), 4,188 (71.63), 8,670 (34.6).

SIXAOLA.—Fy., 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 147 (2,041), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600).

TAMPA (KOVX).—Fy., 125 (2,400), 131 (2,290), 133 (2,256), 135 (2,222), 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 425 (705), 500 (600).

TEXAS (KEFZ).—Fy., add 375 (800); accounts, owner.

TIVIVES.—Fy., 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 147 (2,041), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600).

ULUA.—Type, A1 and A2; fy., 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 147 (2,041), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 510 (730), 425 (705), 454 (660), 469 (640), 500 (600); hours, N; accounts, T. R. T. Co.

VANDA.—Type, A1 and A2; fy., 125 (2,400), 127 (2,362), 129 (2,326), 131 (2,290), 133 (2,256), 135 (2,222), 137 (2,190), 139 (2,158), 141 (2,128), 143 (2,098), 145 (2,069), 147 (2,041), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 425 (705), 500 (600); service, PG; hours, X; rates, 8 cents per word; accounts, R. M. C. A.

VENEZUELA.—Type, A1 and A2; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600); accounts, R. M. C. A.

VIRGINIA (WSBW).—Type, A1 and A2; fy., 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600).

WEST CADDOA.—Type, A arc and B.

WEST HONAKER.—Fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 149 (2,013), 151 (1,987), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 425 (705), 500 (600).
WEST KEBAR.—Accounts, R. M. C. A.
ZACAPA.—Fy., 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 147 (2,041), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600).
Strike out all particulars of the following-named vessel: Aimee.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY, BY CALL SIGNALS

KMV, call changed to KGTI; KOZ, *read* Texas, Louisiana, and New Mexico; KPF, *read* Texas, Louisiana, and New Mexico; KPL, *read* Texas, Louisiana, and New Mexico; KPU, *read* Texas, Louisiana, and New Mexico; KQS, *read* Independence, Calif.; KRR, *read* Texas, Louisiana, and New Mexico; KRS, *read* Texas, Louisiana, and New Mexico; KRT, *read* Texas, Louisiana, and New Mexico; KRV, *read* Texas, Louisiana, and New Mexico; KRW, *read* Texas, Louisiana, and New Mexico; KRZ, *read* Texas, Louisiana, and New Mexico; WCS, *read* Texas, Louisiana, and New Mexico; KUBL, *read* Golden Wall; KVR, call changed to KGTJ; WMCC, *read* Chirikof; WPBN, *read* Enchantress; WJE, *read* Rockport, Wash. (near); strike out all particulars following the call signals, KMB, WBC, WCZ, WDY, WJF, WRX, WTBC. The stations listed as Texas, Louisiana, and New Mexico are portable.

COMMERCIAL AIRCRAFT STATIONS, ALPHABETICALLY, BY NAMES OF CRAFT

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1928, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

Strike out all particulars of the following-named stations: Greater Rockford, NC7080, Maid of Detroit, NX3903, Roma, San Jose to Pan American Goodwill Plane, X7439, Zenith Albatross.

COMMERCIAL ARICRAFT STATIONS, ALPHABETICALLY, BY CALL SIGNALS

Strike out all particulars following the call signals, KDY, KDZ, KHAD, KHAE, KHAH, KHAK, KHAS, WRCA.

BROADCASTING STATIONS, BY CALL SIGNALS

[Alterations and corrections to be made to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1928]

KFBB (Great Falls, Mont.).—Loc. changed to Havre, Mont.
KFIZ (Fond du Lac., Wis.).—Owner, Reporter Printing Co.
KFJI (Astoria, Oreg.).—Power, 100.
KFJZ (Fort Worth, Tex.).—Owner, H. C. Meacham.
KFKB (Milford, Kans.).—Owner, John R. Brinkley, M. D.
KFUR (Ogden, Utah).—Call changed to KLO; power, 100 night, 200 day.
KFVD (Culver City, Calif.).—Fy., 710 (423).
KGCR (Brookings, S. Dak.).—Loc. changed to Watertown, S. Dak., 502 Fifth Street, Mellette Hill.
KGFF (Alva, Okla.).—Owner, KGFF Broadcasting Co., Bell Hotel Building.
KGFI (San Angelo, Tex.).—Owner, Eagle Broadcasting Co.
KGFK (Hallock, Minn.).—Owner, R. W. Lautzenheiser and O. R. Mitchell.
KGU (Honolulu, Hawaii).—Owner, Marion A. Mulrony and Advertiser Publishing Co.
KIT (Portland, Oreg.).—Loc. changed to Yakima, Wash., owner, Carl E. Haymond.
KJBS (San Francisco, Calif.).—Fy., 1,070 (280.4).
KMBC (Independence, Mo.).—Power, 1,000 night, 1,500 day.
KOY (Phoenix, Ariz.).—Power, 500; fy., 1,390 (215.8).
KPCB (Seattle, Wash.).—Power, 50.
KPJM (Prescott, Ariz.).—Owner, Miller and Klahn.
KPO (San Francisco, Calif.).—Power, 5,000.
KTBS (Shreveport, La.).—Power, 500.
KUJ (Longview, Wash.).—Owner, Columbia Broadcasting Co.
KVI (Des Moines, Wash.).—Fy., 760 (395).

KVOS (Bellingham, Wash.).—Owner, Conrad E. Barker, receiver.
WASH (Grand Rapids, Mich.).—Owner, WASH Broadcasting Corporation.
WBOW (Terre Haute, Ind.).—Owner, Banks of Wabash (Inc.).
WCAH (Columbus, Ohio).—Power, 250 night, 500 day.
WDAG (Amarillo, Tex.).—Owner, National Radio and Broadcasting Corporation.
WDGY (Minneapolis, Minn.).—Power, 1,000; fy., 1,180 (254.2).
WEBQ (Harrisburg, Ill.).—Power, 100.
WHA (Madison, Wis.).—Fy., 940 (319).
WHDI (Minneapolis, Minn.).—Fy., 1,180 (254.2).
WIBR (Steubenville, Ohio).—Owner, George W. Robinson.
WILM (Wilmington, Del.).—Fy., 1,420 (211.3).
WIOD (Miami Beach, Fla.).—Power, 500 night, 1,000 day; fy., 560 (536).
WJAG (Norfolk, Nebr.).—Power, 1,000.
WJR–WCX (Pontiac, Mich.).—Strike out call WCX.
WKAR (East Lansing, Mich.).—Power, 1,000.
WKBH (La Crosse, Wis.).—Owner, Joseph Callaway.
WKRC (Cincinnati, Ohio).—Owner, Kodel Electric & Manufacturing Co.
WLBH (Farmingdale, N. Y.).—Call, changed to WPOE; loc., changed to Patchogue, N. Y.; power, 30 night, 100 day.
WNOX (Knoxville, Tenn.).—Owner, Sterchi Brothers Stores (Inc.).
WNRC (Greensboro, N. C.).—Power, 250.
WPSW (Philadelphia, Pa.).—Owner, Wm. Penn Broadcasting Co.
WRNY (Coytesville, N. J.).—Owner, Aviation Radio Station (Inc.).
WSAI (Harrison, Ohio).—Power, 500; fy., 1,330 (225.6).
WTFI (Toccoa, Ga.).—Power, 250.
Strike out all particulars of the following-named stations: WBMH (Detroit, Mich.); WIBZ (Montgomery, Ala.); WALK (Willow Grove, Pa.).

GOVERNMENT LAND STATIONS, ALPHABETICALLY, BY NAMES OF STATIONS

[Alterations and corrections to be made to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1928, and to the International List of Radiotelegraph Stations, published by the Berne bureau]

CONCORD, CALIF.—Strike out all particulars.
BAR HARBOR, ME.—Fy., drop 118.06 (2,541), add 122.05 (2,458).

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY, BY CALL SIGNALS

Strike out all particulars following the call signal KWH.

SPECIAL 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, 1928]

CALIFORNIA:
Bolinas (W6XB).—Owner, R. C. A. Communications (Inc.).
Bolinas (W6XI).—Owner, R. C. A. Communications (Inc.).
Bolinas (W6XU).—Owner, R. C. A. Communications (Inc.).
San Mateo County (W6XQ).—Call, changed to W6XAQ.
HAWAII: Kahuku (K6XO).—Owner, R. C. A. Communications (Inc.).
ILLINOIS: Chicago (W9XO).—Fy., 1,604 (187.03), 2,398 (125.1), 3,256 (92.5), 4,795 (62.57), 6,425 (46.7), 8,650 (34.68).
MASSACHUSETTS: Marion (W1XC).—Owner, R. C. A. Communications (Inc.).
NEW JERSEY:
Bound Brook (W3XL).—Owner, R. C. A. Communications (Inc.).
Coytesville (W2XAL).—Owner, Aviation Radio Station (Inc.).
New Brunswick (W2XAM).—Owner, R. C. A. Communications (Inc.).
Tuckerton (W2XD).—Owner, R. C. A. Communications (Inc.).
NEW YORK:
New York (W2XQ).—Fy., 5,885 (50.98).
Rocky Point (W2XAR).—Owner, R. C. A. Communications (Inc.).
Rocky Point (W2XAS).—Owner, R. C. A. Communications (Inc.).
Rocky Point (W2XBC).—Owner, R. C. A. Communications (Inc.).
Rocky Point (W2XBI).—Owner, R. C. A. Communications (Inc.).
Rocky Point (W2XS).—Owner, R. C. A. Communications (Inc.).
Rocky Point (W2XT).—Owner, R. C. A. Communications (Inc.).
TENNESSEE: Whitehaven (W4XA).—Strike out all particulars.

PORTABLE:
California—
Oakland (W6XG).—Loc. Change to California (portable); fy., 550 (545) to 1,500 (200).
San Francisco (W6XBB).—Fy., 1,604 (187.03), 2,398 (125.1), 3,256 (92.5), 6,425 (46.7), 8,650 (34.68), 12,850 (23.35).
AIRCRAFT: NC4616 (W2XBX).—Fy., 315 (952) to 350 (857), 1,608 (186.57), 2,302 (130.32), 3,076 (97.5), 4,108 (73.028), 5,510 (54.45), 6,155 (48.74).

RADIOBEACONS

[Alterations and corrections to be made to the list of Commercial and Government Radio Stations of the United States, edition of June 30, 1928, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Portland Lightship, Me.—Fy., 290 (1,034).
Boston Lightship, Mass.—Characteristic changed to group of 2 dashes and 2 dots, thus:

— — • • — — • • etc. / 60 seconds ; Silent / 120 seconds

Chesapeake Lightship, Va.—Fy., 285 (1,053).
Cape Henry Light Station, Va.—Characteristic changed to groups of 1 dash, 1 dot, and 1 dash, thus:

— • — — • — / 60 seconds ; Silent / 120 seconds

Fy., 285 (1,053).
Cove Point Light Station, Md.—Characteristic changed to groups of 1 dot and 2 dashes, thus:

• — — • — — etc. / 60 seconds ; Silent / 120 seconds

Frying Pan Shoals Lightship, N. C.—Fy., 310 (968).
St. Johns River Light Station, Fla.—Fy., 285 (1,053).
South Pass West Jetty Range Front Light Station, La.—Fy., 310 (968).
Galveston Jetty Light Station, Tex.—Characteristic changed to groups of 1 dash, 2 dots, and 1 dash, thus:

— • • — — • • — etc. / 60 seconds ; Silent / 120 seconds

Fy., 290 (1,034).
Aransas Pass Light Station, Tex.—Hours, operating periods changed to 2.30 to 2.45, 5.30 to 5.45, 8.30 to 8.45, and 11.30 to 11.45 a. m. and p. m., ninetieth meridian time, daily in clear weather.

MISCELLANEOUS

GENERAL ORDER OF THE FEDERAL RADIO COMMISSION

Visual broadcasting, telephone and relay broadcasting channels defined—conditions under which a license is issued (General Order No. 62, April 5, 1929).—It is ordered that in the frequencies exceeding 1,500 kilocycles per second, a channel of radio communication shall be regarded as a band of frequencies, the width of which varies according to its position in the spectrum. The width of these channels increases with the frequency according to the following table:

Frequency (kilocycles)	Channel width (kilocycles)	Frequency (kilocycles)	Channel width (kilocycles)
1,500–2,198	4	8,210–10,980	20
2,200–3,313	6	10,990–16,405	30
3,316–4,400	8	16,420–21,960	40
4,405–5,490	10	21,980–32,780	60
5,495–8,202.5	15		

NOTE.—A visual broadcasting channel shall not be more than 100 kilocycles in width. A commercial telephone channel below 3,313 kilocycles shall be regarded as 6 kilocycles in width. A relay broadcasting channel between 6,000 and 9,600 kilocycles shall be regarded as 20 kilocycles in width.

In granting licenses, the Federal Radio Commission will specify the frequency in the center of the particular channel licensed to be used, but the licensee may occupy the center frequency and in addition such adjacent frequencies (within the limit indicated on the above table) as may be permitted by the frequency maintenance tolerance and required by the type of emission the station may be authorized to use, all of which will be specified in the instrument of authorization. Furthermore, the licensee, upon application to the commission, may have the privilege of occupying the whole channel on condition that the emission from the station does not exceed the limits of the channel at any time, and provided that fixed stations shall maintain the constancy of any single emission of a carrier frequency to within 0.05 per cent or better at all times.

Fixed stations shall make full use of the channels that may be assigned them to the end that channels are occupied in the most effective and economical manner, and yet their limits not exceeded. The following uses are recognized and will receive encouragement: High-speed telegraphy, facsimile transmission, telephony, multiplex modulation, polyphase transmission, multiple emission on separate frequencies closely spaced.

In order that channels may be utilized to the fullest extent, licensees who have been granted two different channels for use at two or more stations will be granted the use of these same channels at any of the stations in their own system if such use will not create interference with stations of other systems.

Licensees of fixed stations who, at the expiration of the licenses, can not demonstrate that they are using a channel to the fullest capacity consistent with the average state of the radio art, may be required to either occupy a channel of lesser width or to share the channel on a part-time basis with others.

Licensees of fixed stations who have been granted the use of a channel for communications with specified points, upon application to the commission for license, may be granted the use of the same channel for communications with other points on the condition that the public interest, convenience, and necessity will be served by such a grant.

LIST OF COUNTRIES WHICH HAVE DEPOSITED THEIR RATIFICATIONS OF THE INTERNATIONAL RADIO CONVENTION OF 1927 AND THE REGULATIONS ANNEXED THERETO

In addition to the list promulgated in the February, 1929, edition of this publication, the following-named countries have deposited their ratifications with the Department of State on the dates shown: Syro-Libanais territories, March 12, 1929; Estonia, March 22, 1929; Mexico, March 28, 1929.

GULF OF ST. LAWRENCE ICE PATROL

An ice patrol is being maintained in the Gulf of St. Lawrence from Cape Ray to Bird Rocks; from Bird Rocks to the vicinity of Heath Point; and from Heath Point to Cape Ray. It will be maintained until the route is clear of ice. The special call signal VCQP will be used by whatever vessel is engaged in the service. A regular message embodying ice conditions from Cape Race to Quebec and recommendations as to route to be followed will be made up by the ice patrol every four hours commencing as from midnight eastern standard time, seventy-fifth meridian, and kept on file for immediate transmission by radio to ships upon request. This information will also be broadcast four times daily by the ice patrol (VCQP) as follows: At 8 a. m. and p. m., eastern standard time, on a frequency of 500 (600), type B, and at 8.30 a. m. and p. m., eastern standard time, on 185 (1,621), type A2. The coast stations at North Sydney (VCO) and Grindstone (VCN) will copy this message and will be prepared to pass the same to ships requesting it. In addition the following stations will broadcast a brief summary of the above-mentioned message: Louisburg (VAS) at 11 a. m. and p. m., eastern standard time, on a frequency of 107 (2,804), type, A1; Cape Race (VCE) at 9.15 a. m. and p. m. on a frequency of 500 (600), type B; following weather forecasts transmitted by both stations. Ships requiring the latest information on the gulf route should communicate directly with the ice patrol vessel on a frequency of 500 (600), type B.

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

CHANGE IN TIME OF TRANSMISSION OF WEATHER INFORMATION BY SCHEVENINGEN, HOLLAND

This station now transmits storm signals, ice reports, navigational warnings, etc.; at 2030, G. M. T. in lieu of 2130, G. M. T.

NOTICES TO MARINERS TRANSMITTED BY SANTIAGO, CHILE

This station now transmits notices to mariners, press, etc., on a frequency of 100 (3,000), type A1, at 0130, G. M. T. Call signal, CCS.

CHANGE IN TYPE OF EMISSION OF CALCUTTA, INDIA, FOR TRANSMITTING WEATHER REPORTS, TIME SIGNALS, ETC.

This station now transmits weather forecasts, time signals, navigational warnings on c. w. in lieu of spark (150 kc.–2,000 m.).

LIST OF INTERNATIONAL FIXED AND LAND STATIONS NOW AVAILABLE

This list published by the International Bureau of the Telegraph Union, Radiotelegraph Service, as of January, 1929, is now available for distribution by that bureau at 7 francs, 50 centimes, Swiss gold ($1.50), a copy, including supplements to the end of this year and postage.

List of relay broadcasting stations

Call signal	Location	Owner and post office address	Frequency in kilocycles, meters in parenthesis	Power (watts)
W2XAD	South Schenectady, N. Y.	General Electric Co., Schenectady, N. Y.	15,340 (19.557)	25,000
W2XAF	do	do	9,530 (31.48)	40,000
W2XAL	Coytesville, N. J.	Aviation Radio Station (Inc.), 230 Fifth Avenue, New York.	9,700 (30.91)	500
W2XBR	New York, N. Y.	Baruchrome Corporation, 400 East One hundred and thirty-ninth Street, New York.	6,020 (49.83)	1,000
W2XCX	Kearny, N. J.	L. Bamberger & Co., 147 Market Street, Newark, N. J.	6,080 (49.34)	500
W2XE	Richmond Hill, N. Y.	Atlantic Broadcasting Co., 113 West Fifty-seventh Street, New York.	6,120 (49.02)	5,000
W3XAL	Bound Brook, N. J.	Radio Corporation of America, 33 West Forty-second Street, New York.	6,100 (49.18) 9,570 (31.35) 11,720 (25.6) 15,130 (19.828) 17,780 (16.873) 21,500 (13.953)	20,000
W3XL	do	do	6,020 (49.83)	30,000
W8XAL	Harrison, Ohio	Crosley Radio Corporation, 3401 Colerain Avenue, Cincinnati, Ohio.	6,060 (49.5)	250
W8XK	East Pittsburgh, Pa.	Westinghouse Electric & Manufacturing Co. East Pittsburgh, Pa.	6,140 (48.86) 9,570 (31.35) 11,830 (25.25) 15,210 (19.724) 17,780 (16.873) 21,540 (13.928)	20,000
W9XA	Denver, Colo.	General Electric Co., Schenectady, N. Y.	9,530 (31.48)	750
W9XU	Council Bluffs, Iowa	Mona Motor Oil Co., 1124 South Sixth Street, Council Bluffs, Iowa.	6,060 (49.5)	500

List of visual broadcasting (television) stations

Call signal	Location	Owner	Frequency in kilocycles, meters in parentheses	Power (watts)
W1XAE	625 Page Boulevard, East Springfield, Mass.	Westinghouse Electric & Manufacturing Co.	2,000–2,100 (150–142.9)	20,000
W1XAY	Adams Street, Lexington, Mass.	J. Smith Dodge	4,800–4,900 (62.5–61.22)	500
W1XB	63 Gorham Street, Somerville, Mass.	General Industries	2,100–2,200 (142.9–136.4) 2,750–2,850 (109.1–105.3)	500
W2XBA	Newark, N. J.	WAAM (Inc)	2,750–2,850 (109.1–105.3)	50
W2XBS	70 Van Courtlandt Park, S., New York, N. Y. (portable).	Radio Corporation of America.	2,000–2,100 (150–142.9)	5,000
W2XBU	Beacon, N. Y.	Harold E. Smith	4,800–4,900 (62.5–61.22)	100

List of visual broadcasting (television) stations—Continued

Call signal	Location	Owner	Frequency in kilocycles, meters in parentheses	Power (watts)
W2XBV	New York, N. Y. (portable).	Radio Corporation of America.	2,000–2,100 (150–142.9)	5,000
W2XBW	Initial location: River Road, Bound Brook, N. J. (portable).	do	2,000–2,100 (150–142.9)	5,000
W2XCL	323 Berry Street, Brooklyn, N. Y.	Pilot Electric Manufacturing Co.	2,000–2,100 (150–142.9) 2,750–2,850 (109.1–105.3)	250
W2XCO	New York, N. Y. (near)	Radio Corporation of America.	2,100–2,200 (142.9–136.4)	5,000
W2XCR	346–70 Claremont Street, Jersey City, N. J.	Jenkins Television Corporation.	2,100–2,200 (142.9–136.4)	5,000
W2XCW	1 River Road, Schenectady, N. Y.	General Electric Co	2,100–2,200 (142.9–136.4)	20,000
W2XR	140 Nassau Street, New York, N. Y.	John V. L. Hogan	2,000–2,100 (150–142.9) 2,100–2,200 (142.9–136.4)	500
W2XX	Overton Road, Ossining, N. Y.	Robert F. Gowen	2,000–2,100 (150–142.9)	100
W3XK	1519 Connecticut Avenue, Washington, D. C.	Jenkins Laboratories	2,000–2,100 (150–142.9) 2,850–2,950 (105.3–101.7)	5,000
W3XL	River Road, Bound Brook, N. J.	R. C. A. Communications (Inc.).	2,850–2,950 (105.3–101.7)	30,000
W4XE	Winter Park, Fla	William J. Lee	2,000–2,100 (150–142.9)	2,000
W6XAM	Washington and Oak Streets, Los Angeles, Calif.	Ben S. McGlashan	2,000–2,100 (150–142.9)	500
W6XC	5155 South Grammercy Place, Los Angeles, Calif.	Robert B. Parrish	4,500–4,600 (66.67–65.22)	15,000
W7XAO	Portland, Oreg	Wilbur Jerman	2,750–2,850 (109.1–105.3)	100
W8XAV	East Pittsburgh, Pa	Westinghouse Electric & Manufacturing Co.	2,000–2,100 (150–142.9) 2,100–2,200 (142.9–136.4) 2,750–2,850 (109.1–105.3)	20,000
W9XAA	Foot of Grand Avenue, Chicago, Ill.	Chicago Federation of Labor.	2,000–2,100 (150–142.9)	1,000
W9XAG	1768 Wilson Avenue, Chicago, Ill.	Aero Products (Inc.)	2,000–2,100 (150–142.9)	1,000
W9XAO	6312 Broadway, Chicago, Ill.	Nelson Bros. Bond & Mortgage Co.	2,000–2,100 (150–142.9)	500
W9XAZ	Iowa City, Iowa	University of Iowa	2,000–2,100 (150–142.9)	500
WRNY[1]	Hudson Terrace, Coytesville, N. J.	Aviation Radio Station (Inc.).	1,010 (297)	250

[1] Operates between 1 and 6 a. m. only.

DISTRIBUTION OF WEATHER INFORMATION, FORECASTS, AND WARNINGS BY RADIO FOR THE BENEFIT OF NAVIGATION ON THE GREAT LAKES

Weather forecasts and information for such States as are contiguous to the Great Lakes, and forecasts and warnings for the Great Lakes, are broadcast by radio from a number of broadcasting stations cooperating with the United States Weather Bureau. The broadcasts of weather forecasts, warnings, and other pertinent information have been arranged so as to be of special benefit to navigation, shipping, and aviation interests of the Great Lakes region, and are made daily, except as noted, from stations at important lake ports. The daily forecasts of wind and weather are made separately for the upper and lower lakes, and are broadcast accordingly, as indicated in the following schedules:

Stations and schedules

Duluth, Minn.:

Station WEBC.—(Superior); head of the Lakes Broadcasting Co. Radiophone. Fy., 1,280 (234.4). 11.55 a. m. and 5.45 p. m., ninetieth meridian time. (Except Sundays.) 7 a. m. pressure, wind, and weather at Duluth, Port Arthur, Houghton, Marquette, and Sault Ste. Marie. 7 a. m. wind and weather at Portage and Whitefish Point. Forecasts for Duluth-Superior and vicinity, Minnesota, and Wisconsin. Forecasts for the upper Lakes. Storm warnings whenever issued.

Station WME.—I. R. T. Co. Radiotelegraph. Fy., 410 (730), type A2. 10 a. m. and 4 p. m., ninetieth meridian time. 7 a. m. pressure, wind, and weather at Duluth, Port Arthur, Houghton, Marquette, and Sault Ste. Marie. 7 a. m. wind and weather at Portage and Whitefish Point. Forecasts for the upper Lakes. Storm warnings whenever issued.

Duluth, Minn.—Continued.

Station WRL.—R. C. A. Radiotelegraph. Fy., 410 (730), type A2. 10 a. m., 4 and 9.30 p. m., ninetieth meridian time. 7 a. m. pressure, wind, and weather at Duluth, Port Arthur, Houghton, Marquette, and Sault Ste. Marie. 7 a. m. wind and weather at Portage and Whitefish Point. Forecasts for the upper Lakes. Storm warnings whenever issued.

Calumet, Mich.: Station WHDF.—Charles C. MacLeod. Radiophone. Fy., 1,370 (219). 12 noon and 5 p. m., ninetieth meridian time. (Except Sundays and holidays.) Forecasts for Houghton and vicinity and upper Michigan. Storm warnings for Lake Superior whenever issued.

Green Bay, Wis.: Station WHBY.—(West De Pere, Wis.) St. Norbert's College. Radiophone. Fy., 1,200 (250). 7.15 p. m., ninetieth meridian time. (Except Sundays and holidays.) Forecasts for Green Bay and Wisconsin. Summary of weather conditions. Forecasts for the upper Lakes. Storm warnings whenever issued.

Milwaukee, Wis.:

Station WHAD.—Marquette University. Radiophone. Fy., 1,120 (267.9). 4.30 p. m., ninetieth meridian time. (Except Saturdays, Sundays, and holidays.) Forecasts for Milwaukee and Wisconsin. Forecasts for the upper Lakes. Storm warnings whenever issued.

Station WISN.—Evening Wisconsin Co. Radiophone. Fy., 1,120 (267.9). 2.15 and 6 p. m., ninetieth meridian time. (Except Sundays and holidays.) 7 a. m., pressure, wind, and weather at Chicago, Grand Haven, Milwaukee, Escanaba, and Sault Ste. Marie; wind and weather at Mackinaw and Plum Island. Forecasts for Milwaukee and Wisconsin. Forecasts for the upper Lakes. Storm warnings whenever issued.

Station WTMJ.—(Brookfield, Wis.) Milwaukee Journal. Radiophone. Fy., 620 (484) 10.30 a. m., 12 noon, and 10 p. m., ninetieth meridian time. (Except Sundays and holidays.) 7 a. m. pressure, wind, and weather at Chicago, Grand Haven, Milwaukee, Escanaba, and Sault Ste. Marie; wind and weather at Mackinaw and Plum Island. Forecasts for Milwaukee and Wisconsin. Forecasts for the upper Lakes. Storm warnings whenever issued.

Great Lakes, Ill.: Station NAJ.—United States Navy. Radiotelegraph. Fy., 122 (2,459); type A2. 10.15 a. m. and 10 p. m., ninetieth meridian time. 7 a. m. and 7 p. m. pressure, wind, and weather at Chicago, Grand Haven, Milwaukee, Ludington, Escanaba, and Sault Ste. Marie; and wind and weather at Whitefish Point. 7 a. m. wind and weather at Beaver Island, Mackinaw, and Plum Island at 10.15 a. m. Forecasts for upper and lower Lakes. Storm warnings whenever issued. Storm warnings issued in the afternoon are broadcast at 4 p. m., ninetieth meridian time.

Chicago, Ill.:

Station KFKX.—Westinghouse Electric and Manufacturing Co. Radiophone. Fy., 1,020 (294.1). 8.58 a. m., 6 and 10.15 p. m. (except Sundays and holidays); Sundays only—2, 4.30, and 10.15 p. m., ninetieth meridian time. Forecasts for Chicago and vicinity, and Illinois. Aviation forecasts for zones 4 and 8. Forecasts for upper and lower Lakes. Storm warnings whenever issued.

Station KYW.—Westinghouse Electric and Manufacturing Co. Radiophone. Fy., 1,020 (294.1). 11 a. m. (except Sundays and holidays), 11.55 p. m. (except 11 p. m. Sunday nights), ninetieth meridian time. 7 a. m. and 7 p. m. pressure, wind, and weather at Chicago, Grand Haven, Milwaukee, Ludington, Escanaba, and Sault Ste. Marie; and wind and weather at Whitefish Point. 7 a. m. wind and weather at Beaver Island, Mackinaw, and Plum Island at 11 a. m. Forecasts for Illinois, Indiana, Wisconsin, Minnesota, and upper and lower Michigan. Aviation forecasts for zones 4 and 8. Forecasts for upper and lower Lakes. Storm warnings whenever issued.

Station WAAF.—Daily Drovers Journal Publishing Co. Radiophone. Fy., 920 (326). 10.30 a. m. and 12.30 p. m., ninetieth meridian time. (Except Sundays and holidays.) Forecasts for Illinois, Indiana, Wisconsin, Minnesota, and upper and lower Michigan. Aviation forecasts for zones 4 and 8. Forecasts for upper and lower Lakes. General forecast. Storm warnings whenever issued.

Station WBBM.—(Glenview, Ill.) Atlass Co. Radiophone. Fy., 770 (390). 12 noon and 6 p. m., ninetieth meridian time. (Except Sundays and holidays.) Forecasts for Chicago and vicinity, Illinois, Indiana, lower Michigan, upper Michigan, and Wisconsin. Forecasts for upper and lower Lakes. General weather forecasts. Storm warnings whenever issued.

Chicag, Ill.—Continued.

Station WFL.—Chicago Federation of Labor. Radiotelegraph. Fy., 410 (730), type A2. 10 a. m. and 3 p. m., ninetieth meridian time. Forecasts for Chicago and vicinity. Forecasts for upper and lower Lakes. Storm and small craft warnings whenever issued.

Station WCFL.—Chicago Federation of Labor. Radiophone. Fy., 970 (309.1). 12.45 p. m. and 5.40 p. m., ninetieth meridian time. (Except Sundays and holidays.) Forecasts for upper and lower Lakes. General forecast. Storm warnings whenever issued.

Station WENR.—Great Lakes Broadcasting Co. Radiophone. Fy., 870 (345). 10.15 a. m. and 11.40 p. m., ninetieth meridian time. Forecasts for Chicago and vicinity. Forecasts for upper and lower Lakes. General forecasts. Storm warnings whenever issued.

Station WGN.—(Elgin, Ill.) The Tribune Co. Radiophone. Fy., 720 (417). 12 noon and 7 p. m., ninetieth meridian time. Forecasts for Chicago and vicinity, Illinois, Indiana, lower Michigan, upper Michigan, and Wisconsin. Forecasts for upper and lower Lakes. Storm warnings whenever issued.

Station WGO.—R. C. A. Radiotelegraph. Fy., 410 (730); type A1. 11 a. m., 4 and 9 p. m., ninetieth meridian time. 7 a. m. and 7 p. m. pressure, wind, and weather at Chicago, Grand Haven, Milwaukee, Ludington, Escanaba, and Sault Ste. Marie; and wind and weather at Whitefish Point. 7 a. m. wind and weather at Beaver Island, Mackinaw, and Plum Island at 11 a. m. Forecasts for Chicago and vicinity. Forecasts for the upper and lower Lakes. Storm and small craft warnings whenever issued.

Station WLS.—(Crete, Ill.) Agricultural Broadcasting Co. Radiophone. Fy., 870 (345). 9 a. m. and 12.10 p. m., ninetieth meridian time. (Except Sundays and holidays.) Forecasts for Chicago, Illinois, Indiana, Wisconsin, Minnesota, and upper and lower Michigan. General forecast and weather conditions. Aviation forecast for zones 4, 7, and 8 Forecasts for upper and lower Lakes. Storm warnings whenever issued

Station WMAQ.—(Addison, Ill.); Chicago Daily News Co. Radiophone. Fy., 670 (448). 9 and 10.10 a. m., ninetieth meridian time. (Except Sundays and holidays.) Forecasts for Illinois, Indiana, Wisconsin, Minnesota, and Lower Michigan. Aviation forecast for zones 4 and 8. Forecasts for upper and lower Lakes. General forecast. Storm warnings whenever issued.

Mackinac Island, Mich.: Station WHQ.—Mackinac Radio Service. Radiotelegraph. Fy., 410 (730); type A2. 10.15 a. m. and 4.15 p. m., ninetieth meridian time. Forecasts for Lakes Huron, Michigan, and Superior. Storm warnings whenever issued.

Rogers, Mich.: Station WLC.—Michigan Limestone & Chemical Co. Radiotelegraph. Fy., 410 (730); type A1. 8.45 a. m., seventy-fifth meridian time: State of weather and wind direction and velocity at Mackinaw, Middle Island, Alpena, Tawas Point, Harbor Beach, and Port Huron; barometric pressure at Alpena and Port Huron. 10.45 a. m. and 10.30 p. m., seventy-fifth meridian time: Weather forecast for upper Lakes; storm and advisory warnings whenever issued. 4.45 p. m. and 8.45 p. m., seventy-fifth meridian time: State of weather and wind direction and velocity at 4 and 8 p. m., respectively, at Middle Island and Alpena; storm and advisory warnings whenever issued.

Detroit, Mich.:

Station WAFD.—A. B. Parfet Co. Radiophone. Fy., 1,500 (200). 5.30 p. m., seventy-fifth meridian time. (Except Sundays and holidays.) Forecasts for Lower Michigan and Detroit. Forecasts for the upper and lower Lakes. Summary of weather conditions. Storm warnings whenever issued.

Station WGHP.—(Fraser, Mich.); American Broadcasting Co. Radiophone. Fy., 1,240 (241.9). 6.45 p. m., seventy-fifth meridian time. (Except Sundays and holidays.) Forecasts for Detroit and Lower Michigan. Forecasts for upper and lower Lakes. Summary of weather conditions. Storm warnings whenever issued.

Station WJR.—(Pontiac, Mich.) WJR, Inc. Radiophone. Fy., 750 (400). 5.50 p. m., seventy-fifth meridian time. (Except Sundays and holidays.) Forecasts for Detroit and Lower Michigan. Forecasts for the upper and lower Lakes. Summary of weather conditions. Storm warnings whenever issued.

Station WMBC.—Michigan Broadcasting Co. Radiotelegraph. Fy., 1,420 (211.3). 4.35 p. m., seventy-fifth meridian time. (Except Sundays and holidays.) Forecasts for Lower Michigan and Detroit. Forecasts for the upper and lower Lakes. Summary of weather conditions. Storm warnings whenever issued.

Detroit, Mich.—Continued.

Station WWJ.—Detroit News. Radiophone. Fy., 920 (326). 10.25 and 11.55 a. m., and 3.50 p. m. seventy-fifth meridian time. (Except Sundays and holidays.) Forecasts for Lower Michigan and Detroit. Forecasts for upper and lower Lakes. Summary of weather conditions. Storm warnings whenever issued.

Toledo, Ohio: Station WSPD.—Toledo Broadcasting Co. Radiophone. Fy., 1,340 (223.9). 7 p. m., seventy-fifth meridian time. Forecasts for Toledo and vicinity. Storm warnings whenever issued.

Cleveland, Ohio:

Station WCY.—(West Dover) R. C. A. Radiotelegraph. Fy., 410 (730); type A1. 10.30 a. m. and 10.30 p. m., seventy-fifth meridian time. 8 a. m. and 8 p. m., pressure, wind, and weather at Cleveland, Toledo, and Erie. Forecasts for the lower and upper Lakes. Storm warnings for Lake Erie, and advisory warnings for the Great Lakes whenever issued.

Station WEAR.—WTAM-WEAR, Inc. Radiophone. Fy., 1,070 (280.4). 12 noon and 4 p. m., seventy-fifth meridian time. (Except Sundays and holidays.) 8 a. m., pressure, wind, and weather at Cleveland, Toledo, and Erie. Forecasts for Ohio and Cleveland. Forecasts for the lower and upper Lakes. Summary of weather conditions. Storm warnings whenever issued.

Station WJAY.—Cleveland Radio Broadcasting Corporation. Radiophone. Fy., 620 (484). 11.15 a. m. and 5.30 p. m., seventy-fifth meridian time. (Except Sundays and holidays.) Forecasts for Cleveland and vicinity, and Ohio. Forecasts for lower and upper Lakes. Summary of weather conditions. Storm warnings whenever issued. 5.30 p. m., Sundays and holidays only. Forecasts for Ohio and Lake Erie. Storm warnings whenever issued.

Station WTAM.—WTAM-WEAR (Inc.). Radiophone. Fy., 1,070 (280.4). 6.55 p. m., seventy-fifth meridian time. (Except Sundays and holidays.) 8 a. m., pressure, wind, and weather at Cleveland, Toledo, and Erie. Forecasts for Cleveland and vicinity, and Ohio. Forecasts for the lower and upper Lakes. Summary of weather conditions. Storm warnings whenever issued. 5.45 p. m. (Sundays and holidays only.) Forecasts for Ohio and Lake Erie. Storm warnings whenever issued.

Station WTK.—I. R. T. Co. Radiotelegraph. Fy., 410 (730); type A2. 11.05 a. m., 4 and 10.10 p. m., seventy-fifth meridian time. 8 a. m., pressure, wind, and weather at Cleveland, Toledo, and Erie at 11.05 a. m. only. Forecasts for the lower and upper Lakes. Storm warnings for Lake Erie and advisory messages for the Great Lakes whenever issued.

Buffalo, N. Y.:

Station WAM.—I. R. T. C. Radiotelegraph. Fy., 410 (730); type A2. 11 a. m. and 10 p. m., seventy-fifth meridian time. 8 a. m. and 8 p. m. pressure, wind, and weather at Buffalo and Oswego. Forecasts for the lower Lakes. Storm warnings whenever issued.

Station WBL.—R. C. A. Radiotelegraph. Fy., 410 (730); type A1. 8 a. m. and 8 p. m., seventy-fifth meridian time, pressure, wind, and weather at Buffalo and Oswego will be furnished vessel masters upon request. Storm warnings whenever issued.

Station WGR.—WGR, Inc. Radiophone. Fy., 550 (545). 12 noon, 6 and 11 p. m., seventy-fifth meridian time. Forecasts for Buffalo and western New York. Forecasts for lower Lakes. Summary of weather conditions. Storm warnings whenever issued.

Station WMAK.—WMAK Broadcasting System. Radiophone. Fy., 900 (333.1). 12 noon and 7 p. m., seventy-fifth meridian time. (Except Sundays and holidays.) Forecasts for Buffalo and western New York. Forecasts for lower Lakes. Summary of weather conditions. Storm warnings whenever issued.

Rochester, N. Y.:

Station WHAM.—(Victor Township, N. Y.); Stromberg-Carlson Telephone Mfg. Co. Radiophone. Fy., 1,150 (260.9). 11.30 a. m., 6.30 and 11 p. m., seventy-fifth meridian time. (Except 11.30 a. m. and 6.30 p. m. Sundays and holidays.) 8 a. m. pressure, wind, and weather at Rochester and Buffalo. Forecasts for Rochester and vicinity and western New York. Forecasts for lower Lakes. Storm warnings whenever issued.

Rochester, N. Y.—Continued.

Station WHEC.—Hickson Electric Co. Radiophone. Fy., 1,440 (208.3). 12 noon, seventy-fifth meridian time. (Except Sundays and holidays.) 8 a. m. pressure, wind, and weather at Rochester and Buffalo. Forecasts for Rochester and vicinity and western New York. Forecasts for lower Lakes. Storm warnings whenever issued.

East Pittsburgh, Pa.: Station KDKA.—Westinghouse Electric & Manufacturing Co. Radiophone. Fy., 980 (306). 9.40 a. m., seventy-fifth meridian time. (Except Sundays and holidays). Forecasts for Pennsylvania and Ohio. 12 noon, seventy-fifth meridian time. (Except Sundays and holidays.) Forecasts for Pennsylvania and Ohio. Weather conditions. Storm warnings for Great Lakes whenever issued. 4 p. m., seventy-fifth meridian time. (Except Sundays and holidays.) Forecasts for Pennsylvania and Ohio. 10.30 or 11 p. m. (At end of program.) Seventy-fifth meridian time. Forecasts for Pennsylvania, New York, lower and upper Michigan, Ohio, and Indiana. Storm warnings for upper and lower Lakes whenever issued.

NOTE.—Broadcasts are made throughout the year from the following radio stations: WEBC, WHDF, WHBY, WHAD, WISN, WTMJ, KFKX, KYW, WAAF, WBBM, WCFL, WENR, WGN, WLS, WMAQ, WAFD, WMBC, WGHP, WJR, WWJ, WSPD, WEAR, WJAY, WTAM, KDKA, WGR, WMAK, WHAM, and WHEC. All other stations broadcast only during the season of navigation on the Great Lakes. Storm warnings, weather conditions at certain indicated lake points, and the forecasts for the upper and lower Lakes are broadcast only during the season of navigation.

REFERENCES TO CURRENT RADIO LITERATURE

This is a monthly list of references prepared by the Bureau of Standards and is intended to cover the more important papers of interest to professional radio engineers which have recently appeared in periodicals, books, etc. 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, Bureau of Standards Circular No. 138, a copy of which may be obtained for 10 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C. The various articles listed below are not obtainable from the Government. The various periodicals can be secured from their publishers and can be consulted at large public libraries.

R100.—*Radio Principles*

R113 Störmer, C. Sur un echo d'ondes electromagnetiques courtes arrivant plusieurs seconds après le signal emis et son explication d'après la theorie des Auroras Borealis. (On an echo of short electromagnetic waves arriving several seconds after the main signal and explanation by means of the theory of the Aurora Borealis.) L'Onde Electrique, **7**, pp. 531–533; December, 1928.

Same work reported in abstract in Comptes Rendus, **187** p. 811, November 5, 1921, and in Nature (London), November 3, 1921.

R113 Van der Pol, B. Les echos des ondes courtes et les Auroras Borealis. (Short-wave echoes and the Auroras Borealis.) L'Onde Electrique, **7**, pp. 534–537; December, 1928.

Does not agree with Störmer's explanation since rays will never pass through the upper region of the Heaviside layer, but where short waves pass into the layer at a large angle they may go into electron densities where the phase velocity becomes almost infinity, that is, the group velocity almost zero. The reflected wave can then come back to earth after a considerable time has elapsed.

R113 Jelstrup, H. S. J. Essai d'explication de l'echo Störmer-Hals sur les ondes de 31.4 metres de PCJJ. (Analysis of the explanation of the echo of Störmer-Hals on waves of 31.4 meters from PCJJ.) L'Onde Electrique, **7**, pp. 538–540; December, 1928.

Attributes the long-interval echoes to many reflections between the Heaviside layer and the earth and calculates the time lapse between the original signal and the echo by means of Howe's equivalent transmission line formula for the Heaviside layer.

R113 Clapp, J. K. Some experiments in short distance short wave radio transmission. Proc. Institute of Radio Engineers, **17**, pp. 479–493; March, 1929.

Some experiments in short-wave radio transmission over a distance of 55 miles are described.

R113 Fassbender, H., and Kurlbaum, G. Abhängigkeit der Reichweite sehr kurzer Wellen von der Höhe des Senders über der Erde. (Dependence of the range of very short waves on the height of the transmitter above the earth.) Zeits. für Hochfrequenztechnik, **33**, pp. 52–55; February, 1929.

Experiments on range of transmission on wave length of 3.7 m. This work was carried out on an airplane, the transmitter being on the plane and the receiver on the ground.

R113 Gerth, F., and Scheppman, W. Untersuchungen über die Ausbreitungsvorgänge ultra-kurzer Wellen. (Experiments on the radiation of ultra-short waves.) Zeits. für Hochfrequenztechnik, **33**, pp. 23–27; January, 1929.

An investigation of radiation for waves shorter than 28 megacycles. It is shown that the waves spread out like light and that objects larger than a wave length produce shadow effects. It is assumed that only direct waves play a part and calculations are given for the distance range.

R113.4 Guyot. Étude sur la propagation des ondes courtes. (Study on the propagation of short waves.) L'Onde Electrique, **7**, pp. 509–530; December, 1928.

Review of the propagation of short waves assuming that the Heaviside layer is defined by the position of the earth's surface with respect to the sun. Based on this, the height of the layer depends on the time during the 24 hours, the latitude of the station and the declination of the sun. Experimental curves are given, based on simplified formulas for the calculation of the height of the layer.

R113.5 Maris, H. B., and Hulburt, E. O. Wireless telegraphy and magnetic storms. Proc. Institute of Radio Engrs., **17**, pp. 494–500; March, 1929.

A recent theory of auroras and magnetic storms attributes these phenomena to the action of a flash of ultra-violet light from the sun; this flash causing an unusual ionization in the Kennelly-Heaviside layer. This theory is found to be borne out in a detailed discussion of data of high frequency (7,500 to 20,000 kc.) circuits of the U. S. Navy during the magnetic storms of May 28, July 7, and October 18 and 24, 1928.

R125.1 Smith-Rose, R. L. Radio direction finding by transmission and reception (with particular reference to its application to marine navigation). Proc. Institute of Radio Engrs., **17**, pp. 425–478; March, 1929.

A résumé of the performance of apparatus employed for radio direction finding determination either by transmission or by reception is given. Investigations made in England on this subject and results obtained are reviewed. Application of direction finding to navigation and possible effect of coastal and night errors in connection therewith are discussed.

R125.6 Pistolkors, A. A. The radiation resistance of beam antennas. Proc. Institute of Radio Engrs., **17**, pp. 562–579; March, 1929.

A method proposed by Brillouin for the calculation of radiation resistance applied to several types of beam antennas is described.

R130 Kingdon, K. H., and Mott-Smith, H. M. The operation of radio receiving tube filaments on alternating currents. General Electric Rev., **32**, pp. 139–148; March, 1929.

It is shown that three disturbances may occur in amplifiers using alternating current feed for the filament supply; namely, the primary potential ripple, the primary magnetic ripple and the primary temperature ripple. In this part of the paper (Pt. I) the case of the amplifiers is treated and methods given for reducing these effects.

R132 Brain, B. C. Output characteristics of thermionic amplifiers. Experimental Wireless & W. Engr. (London), **6**, pp. 119–127; March, 1929.

Analytical treatment of the output amplifier for optimum undistorted energy transfer. It is shown that the maximum output is obtained by making the load resistance about 1.6 times the alternating-current resistance of the tube.

R133 Lazaref, W. Über die Instabilität der Frequenz von Röhren generatoren und deren Stabilisierung. (On the instability of the frequency of electron tube generators and their stabilization.) Zeits. für Hochfrequenztechnik, **33**, pp. 55–63; Feburary, 1929.

The effect of filament excitation, B voltage, and feed back on the frequency is studied. The cause is due to the grid current which increases the decrement.

R133 Hollmann, H. E. Zusammenfassender Bericht: Die Erzeugung kürzester elektrischer Wellen mit Elektronenröhren. (Compilation on the production of ultra short waves.) Zeits. für Hochfrequenztechnik, **33**, pp. 27–30; January; pp. 66–74, February, 1929.

Lists the methods for the production of ultra short waves.

R134 Nelson, J. R. Notes on grid circuit detection. Proc. Institute of Radio Engrs., **17**, pp. 551–561; March, 1929.

Shows that the value of the second derivative of grid current with respect to grid voltage, the main term in grid rectification, may be found by the change in direct current in the grid circuit with any desired value of input voltage. An experimentally determined curve is given showing the detector frequency distortion of a commercial set for a 2-megohm grid leak and for a ½-megohm grid leak.

R134.7 Aigner, F. Das Problem der ökonomischten Vielfachtransponierung. (The problem of economic multiheterodyning.) Zeits. für Hochfrequenztechnik, **33**, pp. 9–15, January; pp. 47–52, February, 1929.

Methods are investigated by means of which the incoming frequency can be changed with a minimum number of local oscillators. Two heterodyne oscillators suffice to produce almost any multiple frequency changes.

R149 Kryter, R. J. Alternating current rectification as applied to radio—Pt. I. QST, **13**, pp. 33–37; April, 1929.

Discussion of tube and chemical rectifiers.

R200.—*Radio measurements and standardization*

R230 Harris, S. An extension of the method of measuring inductances and capacities. Proc. Inst. Radio Engrs., **17**, pp. 516–520; March, 1929.

Substitution method commonly employed for measuring small capacities is here shown to be a special case of a more general principle.

R300.—*Radio apparatus and equipment*

R334 Pike, O. W., and Spitzer, E. E. A new low-power screen grid transmitting tube—UX 865. QST, **13**, pp. 43–45; April, 1929.

Uses of tube as amplifier and characteristics of tube given.

R343 Beers, G. L., and Carlson, W. L. Recent developments in superheterodyne receivers. Proc. Institute of Radio Engrs., **17,** pp. 501–515; March, 1929.

Major electrical elements of a modern superheterodyne receiver discussed briefly, and practical volume control is described.

R357 Freese, H. Beseitigung der Nebenfrequenzen beim statischen Frequenzwandler. (Elimination of side frequencies for the static frequency changer.) Zeits. für Hochfrequenztechnik, **33,** pp. 1–8, January; pp. 41–46, February, 1929.

The absorption system due to Lorenz (British patent No. 263825) and that due to Zenneck is investigated. As analyser, the cathode-ray oscillograph or an undamped wavemeter was used.

R376.3 Kyle, C. Kyle condenser reproducer. Radio Engineering, **9,** pp. 26–29; March, 1929.

Practical and theoretical discussion of an electrostatic speaker of interesting design.

R376.3 Hector, L. G., and Kozanowski, H. N. Apparent equality of loud-speaker output at various frequencies. Proc. Institute of Radio Engrs., **17,** pp. 521–535; March, 1929.

Describes a type of alternation phonometer which permits rapid switching of power at two frequencies to the same loud-speaker without the distracting effects of the transients that would result from ordinary types of commutation. This result is obtained by the use of rotating condensers to provide variable capacitive reactance in the input circuit of the power amplifier that operates the speaker.

R381 Coursey, P. R. On the capacity of dry electrolytic condensers. Experimental Wireless & Wireless Engr. (London), **6,** pp. 128–132; March, 1929.

Gives a description of the wet and semiwet (so-called dry) electrolytic condensers and emphasises that especially for the latter type an alternating-current method (not ballistic method) has to be used for measuring the effective capacity.

R386 Reed, F. Superheterodyne band pass filters. Radio Listeners Guide & Call Book, pp. 45–47: Spring, 1929.

Design data for band pass filters.

R400.—*Radio communication systems*

R412 Hull, R. A. Modern practice in high-frequency radio telephony. QST, **13,** pp. 8–22; April, 1929.

Discussion of improved method in amateur phone transmission.

R431 Tanner, R. William. Reducing noise in broadcast receivers. Radio Engineering, **9,** pp. 24–25; March, 1929.

Use of resonance wave coil, band pass filters, and power detector tube.

R500.—*Applications of radio*

R520 Marriott, R. H. Electrical aids to navigation (abridgement). Jnl. American Institute of Elec. Engrs., **48,** pp. 195–199; March, 1929.

Electrical and magnetic aids to navigation by water and air are outlined. Discussions on the earth inductor compass, radio compass, radiobeacon, submarine signals, height indicators for aircraft, etc., are given. A bibliography is included.

R526.1 Dellinger, J. H. Directional radio as transport safety factor. Aeronautical World, **2,** pp. 20–22; February, 1929.

Description of Bureau of Standards work on aviation radiobeacon.

R582 Zworykin, V. Facsimile picture transmission. Proc. Institute of Radio Engrs., **17,** pp. 536–550; March, 1929.

A facsimile picture transmitting system is described whose chief object is to produce a simple rugged apparatus for practical use without requiring the attention of a skilled operator.

R800.—*Nonradio subjects*

534 Does a vibrating diaphragm carry a mass of air with it? (editorial). Exp. Wireless & W. Engr. (London), **6,** pp. 117–118; March, 1929.

Since dealing mostly with divergent waves the velocity of air particles lags behind the pressure. Hence the force at the surface of a spherical surface will be out of phase with its velocity as though the diaphragm had a certain mass or as if a mass of air were attached to it.

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