

**U. S. DEPARTMENT OF COMMERCE
RADIO DIVISION**

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ABBREVIATIONS AND SYMBOLS

The necessary corrections to the list of Commercial and Government Radio Stations of the United States and to the International Lists of Radio 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 parentheses.
Service	= Nature of service maintained: PG=general public (ship to shore), PR=limited public (limited to public correspondence between fixed stations), P=private (limited commercial and special), O=Government business exclusively.
Class	= FX=fixed station (point-to-point service), RG=radio-compass station, FA=aeronautical station, AB=aviation beacon, RF=circular radiobeacon, B=ship station, FC=coast station.
House	= Hours of operation: N=continuous service, X=no regular hour, Y=sunrise to sunset.
Accounts	= Message accounts settled by.
I. R. T. Co.	= Inter-city Radio 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, 1929, and to the International List of Fixed and Land Stations, published by the Berne bureau]

Station	Class	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Owner
Baganga, P. I. ¹	FA, FC	KBB	272.7 (1,100), 333 (900), 500 (800)	PG	-----	Philippine insular government.
Barstow, Calif. ²	FA, FX	KGNG	278 (1,080), 333 (900), 393 (765)	P	X	Transcontinental Air Transport (Inc.)
Cajidiocan, P. I. ³	FA, FC	KBU	230.8 (1,300), 333 (900), 789 (380)	PG	-----	Philippine insular government.
Detour, Mich. ⁴	FC, FX	WAA	148 (2,100), 161 (1,865), 167 (1,795), 410 (730), 425 (705), 454 (660), 4,775 (62.82), 5,525 (54.3), 8,570 (35.01)	PG, PR	N	R. C. A.
East St. Louis, Ill. ⁵	FA, FX	KGNI	278 (1,080), 333 (900), 400 (750)	P	X	Transcontinental Air Transport (Inc.)
George Inlet, Alaska ⁶	FC, FX	KFZ	220 (1,365), 274 (1,095), 460 (650), 500 (600)	PG, PR	X	Libby, McNeill & Libby.
Glendale, Calif. ⁷	FA, FX	KGNH	278 (1,080), 333 (900), 400 (750)	P	X	Transcontinental Air Transport (Inc.)
Hood Bay, Alaska ⁸	FC, FX	KFB	212 (1,415), 246 (1,220), 460 (650), 500 (600)	PG, PR	X	Hood Bay Canning Co.
Kansas City, Mo. ⁹	FA, FX	KGNI	278 (1,080), 333 (900), 393 (765)	P	X	Transcontinental Air Transport (Inc.)
Karheen, Alaska ¹⁰	FC, FX	KFO	220 (1,365), 227 (1,320), 268 (1,120), 274 (1,095), 460 (650), 500 (600)	PG, PR	X	Libby, McNeill & Libby.
Los Angeles, Calif. ¹¹	FX	KQT	3,178 (94.4), 3,184 (94.2), 3,238 (92.65), 3,244 (92.5)	P	X	City of Los Angeles, Department of Water and Power.
Montague, Calif. ¹²	FA, FX	KGSK	278 (1,080), 3,070 (97.71), 3,460 (86.70), 6,350 (47.24), 8,015 (37.43), 12,180 (24.63)	P	X	West Coast Air Transport.
Portland, Oreg. ¹³	FA, FX	KGSW	278 (1,080), 3,070 (97.71), 3,460 (86.70), 6,350 (47.24), 8,015 (37.43), 12,180 (24.63)	P	X	Do.
St. Louis, Mo. ¹⁴	FX	KGPC	2,452 (122.34)	P	X	St. Louis police department.
Seattle, Wash. ¹⁵	FA, FX	KGSS	278 (1,080), 3,070 (97.71), 3,460 (86.70), 6,350 (47.24), 8,015 (37.43), 12,180 (24.63)	P	X	West Coast Air Transport.
Syracuse, N. Y. ¹⁶	FA	WQDT	278 (1,080), 3,452 (86.90)	P	X	Empire Air Transport Co. (Inc.)
Tilik, P. I. ¹⁷	FC	KAF	257.5 (1,165), 375 (800), 494.2 (607), 571.4 (525)	PG	-----	Philippine insular government.
Zumarraga, P. I. ¹⁸	FC	KBZ	500 (600), 857 (350)	PG	-----	Do.
<i>Portable</i>						
Western States ¹⁹	FX	KGNR	1,600 (187.5), 1,652 (181.6), 1,664 (180.29), 1,680 (178.6), 1,704 (176.06)	P	X	Gulf Production Co.

¹ Loc. 126° 33' 58" E., 7° 34' 00" N.; type, A2; power, M/amp. 24.38/2.2; hours, 8-12 a. m., 2-5.30 p. m. daily, 9-11 a. m., 2-3.30 p. m. Sundays and holidays; ship schedule, 50-60 minutes of each hour; rates, 6 cents per word.

² Type, A1, A2, A3.

³ Loc. 120° 41' 06" E., 12° 22' 12" N.; type, A2; power, M/amp. 24.38/2.25; hours, 8-12 a. m., 2-5.30 p. m. daily, 9-11 a. m., 2-3.30 p. m. Sundays and holidays; ship schedule, 20-30 minutes of each hour; rates, 6 cents per word.

⁴ Type, A1, A2; rates, 10 cents per word.

⁵ Loc. (approximate) 131° 30' 00" W., 55° 25' 00" N.; type, A1.

⁶ Loc. (approximate) 134° 23' 00" W., 57° 22' 50" N.; type, A1; rates, 6 cents per word.

⁷ Loc. (approximate) 133° 18' 00" W., 55° 48' 00" N.; type, A1.

⁸ Type, A1; power, M/amp. 15.4/2.

⁹ Type, A3.

¹⁰ Type, A1, A3.

¹¹ Loc. 120° 11' 54" E., 13° 49' 06" N.; type, A2; power, M/amp. 23.4/2.5; hours, 8-12 a. m., 2-5.30 p. m. daily, 9-11 a. m., 2-3.30 p. m. Sundays and holidays; ship schedule, 50-60 minutes of each hour; rates, 6 cents per word.

¹² Loc. 124° 51' 00" E., 11° 38' 30" N.; type, A1, A2; power, M/amp. 23.4/1.5; hours, 8-12 a. m., 2-5.30 p. m. daily, 9-11 a. m., 2-3.30 p. m. Sundays and holidays; ship schedule, 40-50 minutes of each hour; rates, 6 cents per word.

Commercial ship stations, alphabetically, by name of vessels

[Additions to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1929, and to the International List of Ship Stations, published by the Berne bureau]

Name of vessel	Call signal	Rates, all services (cents)	Service	Hours	Owner	Message accounts settled by—
Afognak	KGNQ				Alaska Packers Association	
Alabat ¹	KZBL	4	PG	X	Manila Railroad Co.	Owner.
Alltak	KGNP				Alaska Packers Association	
Argus ²	KZCG	4	PG		Madrigal & Co.	Do.
Azalea	KFSP	8	PG	X	Robinson Fisheries Co. (Inc.)	Do.
Brant	KGNT				Alaska Packers Association	Do.
Cities Service Oklahoma	KOJT		PG	X	Cities Service Transportation Co.	R. M. C. A.
Delerof	KUKP	8	PG	X	Alaska Packers Association	Owner.
Dollar S. S. Lines ³	WDOL				Dollar S. S. Lines	
Doris E	KGNM		P	X	Alaska Pacific Salmon Corporation	Do.
Etak	KGNL				Walter G. Ladd	
Kaimiloo ⁴	KFUH		P	X	Wilbert Melville	Do.
Munardan ⁵	KGNK	8	PG	X	Munson S. S. Line	Do.
Mumeric ⁶	KGNN	8	PG	X	do	Do.
Naga ⁷	KZAM	4	PG	X	Manila Railroad Co.	Do.
Plow City ⁸	KUCC	8	PG	X	Charles Nelson Co. (Inc.)	R. M. C. A.
Raven	KGNU	8	PG	X	Alaska Packers Association	Owner.
Samarar III	KGNS				Charles T. Fisher	
Thrasher	KGNV	8	PG	X	Alaska Packers Association	Do.
Veedol No. 2	KGNE				Tidewater Associated Transport Co.	
Watsonville	WPUI	8	PG	X	Hammond Lumber Co.	R. M. C. A.
Wawona ⁹	KGND	8	PG	X	Robinson Fisheries Co. (Inc.)	Owner.
Yes Bay ¹⁰	KGNX		P	X	Alaska Pacific Salmon Corporation	Do.

¹ Fy., 454.5 (660), 500 (600), 5,615 (53.42).

² Fy., 458 (655), 600 (600); hours, 8-11 a. m., 3-5 and 9-11 p. m.

³ General call signal for any or all vessels.

⁴ Type, A1, A2, and B; fy., 375 (800), 425 (705), 500 (600), 5,525 (54.3), 5,555 (54), 8,290 (36.19); power, M/amp 35/6.

⁵ Type B; fy., 375 (800), 425 (705), 500 (600); power, M/amp. 30/5.

⁶ Type, B; fy., 375 (800), 425 (705), 500 (600); power, M/amp. 29/5.

⁷ Fy., 454.5 (660), 500 (600), 5,615 (53.42).

⁸ Type, B; fy., 375 (800), 425 (705), 500 (600).

⁹ Type, A2; fy., 375 (800), 425 (705), 500 (600).

¹⁰ Type, A3.

Commercial land and ship stations, alphabetically, by call signals

Call signal	Name of station	Call signal	Name of station
KAF	Tilik, P. I.	fc	
KBB	Baganga, P. I.	fc	
KBU	Cajidiocan, P. I.	fc	
KBZ	Zumarraga, P. I.	fc	
KFB	Hood Bay, Alaska	fc, fx	
KFC	Karheen, Alaska	fc, fx	
KFSP	Azalea	b	
KFZ	George Inlet, Alaska	fc, fx	
KFUH	Kaimiloo	b	
KGND	Wawona	b	
KGNE	Veedol No. 2	b	
KGNG	Barstow, Calif.	fa, fx	
KGNH	Glendale, Calif.	fa, fx	
KGNI	East St. Louis, Ill.	fa, fx	
KGNJ	Kansas City, Mo.	fa, fx	
KGNK	Munardan	b	
KGNL	Etak	b	
KGNM	Doris E	b	
KGNN	Mumeric	b	
KGNP	Alltak	b	
KGNQ	Afognak	b	
KGNR	Western States (portable)	fx	
KGNS	Samarar III	b	
KGNT	Brant	b	
KGNU	Raven	b	
KGNV	Thrasher	b	
KGNX	Yes Bay	b	
KGPC	St. Louis, Mo.	fx	
KGSK	Montague, Calif.	fa, fx	
KGSS	Seattle, Wash.	fa, fx	
KGSW	Portland, Oreg.	fa, fx	
KOJT	Cities Service Oklahoma	b	
KQT	Los Angeles, Calif.	fx	
KUCC	Plow City	b	
KUKP	Delerof	b	
KZAM	Naga	b	
KZBL	Alabat	b	
KZCG	Argus	b	
WAA	Detour, Mich.	fc, fx	
WDOL	Dollar S. S. Lines ¹	b	
WPUI	Watsonville	b	
WQDT	Syracuse, N. Y.	fa, fx	

¹ General call for any or all vessels.

Commercial aircraft stations, alphabetically, by names of craft

[Additions to the List of Radio Stations of the United States, edition of June 30, 1929, and to the International List of Aircraft Stations published by the Berne bureau]

Station	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Owner
Arf Pint 1	KHIIR	333 (900), 375 (800), 414 (725), 457 (655), 500 (600).	P	X	Col. Robert R. McCormick, 435 North Michigan Avenue, Chicago, Ill.
C-226M 2	KHJSH	3,106 (96.58), 3,172 (94.57); 5,660 (53).	P	X	Boeing Air Transport (Inc.).
F-113 W. A. E. 3	KHCVE	3,070 (97.71), 3,106 (96.58), 3,460 (86.70), 6,350 (47.24).	P	X	Western Air Express (Inc.).
F-116 W. A. E. 3	KHCQJ	do	P	X	Do.
Fleetster No.	KHKNM	do	P	X	New York, Rio & Buenos Aires Line (Inc.).
Juneau 4	KHIFU	333 (900), 375 (800), 457 (655), 500 (600), 3,106 (96.58).	PG	X	Alaska Washington Airways (Inc.), 414 University Street, Seattle, Wash.
Ketchikan 4	KHIGT	do	PG	X	Do.
NC-227M 2	KHJTG	3,106 (96.58), 3,172 (94.57), 5,660 (53).	P	X	Boeing Air Transport (Inc.).
No. 51 W. A. E. 3	KHCOSH	3,070 (97.71), 3,106 (96.58), 3,460 (86.70), 6,350 (47.24).	P	X	Western Air Express (Inc.).
No. 52 W. A. E. 3	KHCTG	do	P	X	Do.
No. 53 W. A. E. 3	KHCUF	do	P	X	Do.
No. 400 W. A. E. 3	KHCNM	do	P	X	Do.
No. 401 W. A. E. 3	KHCOL	do	P	X	Do.
No. 402 W. A. E. 3	KHCPK	do	P	X	Do.
Santos	KHKMN	do	P	X	New York, Rio & Buenos Aires Line (Inc.).
Uruguay	KHKOL	do	P	X	Do.
NC-7117	KHMAZ	do	P	X	TAT-Maddux Air Lines.
NC-7119	KHMBY	do	P	X	Do.
NC-7582	KHMCX	do	P	X	Do.

1 Type, A1, A3. 2 Type, A3. 3 Type, A1, A2, A3. 4 Type, A1, A3; rates, 8 cents per word.

Commercial aircraft stations, alphabetically, by call signals

Call signal	Name of station	Call signal	Name of station	Call signal	Name of station
KHCNM	No. 400 W. A. E.	KHCVE	F-113 W. A. E.	KHKNM	Fleetster No. 2.
KHCOL	No. 401 W. A. E.	KHIFU	Juneau	KHKOL	Uruguay.
KHCPK	No. 402 W. A. E.	KHIGT	Ketchikan	KHMAZ	NC-7117.
KHCQJ	F-116 W. A. E.	KHIIR	Arf Pint	KHMBY	NC-7119.
KHCOSH	No. 51 W. A. E.	KHJSH	C-226M	KHMCX	NC-7582.
KHCTG	No. 52 W. A. E.	KHJTG	NC-227M		
KHCUF	No. 53 W. A. E.	KHKMN	Santos.		

Broadcasting stations, alphabetically, by names of States and cities

[Additions to the List of Radio Stations of the United States, edition of June 30, 1929]

State and city	Call signal	Frequency in kilocycles, meters in parentheses	Power (watts)
Kansas: Dodge City	KGNO	1,210 (247.9)	100
Nebraska: North Platte	KGNF	1,430 (209.8)	1 500
Virginia: Roanoke	WRBX	1,410 (212.8)	250

1 Daytime only.

Broadcasting stations, alphabetically, by call signals

Call signal	Location of transmitter (mail address)	Owner	Frequency in kilocycles, meters in parentheses	Power (watts)
KGNF	North Platte, Nebr., 2511 R Street.	Herbert L. Spencer	1,430 (209.8)	1 500
KGNO	Dodge City, Kans., Lora-Locke Hotel.	Melvin A. McCollom	1,210 (247.9)	100
WRBX	Roanoke, Va., Hotel Roanoke	Richmond Development Corporation.	1,410 (212.8)	250

1 Daytime only.

Government land stations, alphabetically, by name of station

[Addition to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1929, and to the International List of Fixed and Land Stations published by the Berne bureau]

Station	Class	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Owner
Fort Riley, Kans. ¹	FX	WYV	200 (1,500).....	O	X	U. S. Army.
Sault Ste. Marie, Mich.....	FC	NOZ	.....	O	.....	U. S. Coast Guard.
Washington, D. C. (Washington district reserve unit).	FX	NDN	.....	O	.....	U. S. Navy.

¹ Loc. 96° 46' 00" W., 39° 03' 00" N. (approximately); type, A1, A2, A3.

Government ship station, by name of station

[Addition to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1929, and to the International List of Fixed and Land Stations published by the Berne bureau]

Station	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Owner
Shoshone.....	NRUV	.....	O	X	U. S. Coast Guard ;

Government land and ship stations, alphabetically, by call signals

Call signal	Name of station	Call signal	Name of station
NDN	Washington, D. C. (Washington district reserve unit).....fx	NRUV	Shoshone.....b
NOZ	Sault Ste. Marie, Mich.....fx	WYV	Fort Riley, Kans.....fx

Government aircraft stations, alphabetically, by names of craft

[Additions to the List of Radio Stations of the United States, edition of June 30, 1929, and to the International List of Aircraft Stations published by the Berne bureau]

Station	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Owner
Augusta—any aircraft attached to.....	NVMAF	.....	O	.....	U. S. Navy.
Chester—any aircraft attached to.....	NVMAM	.....	O	.....	Do.
Chicago—any aircraft attached to.....	NVMAG	.....	O	.....	Do.
Houston—any aircraft attached to.....	NVMAL	.....	O	.....	Do.
Indianapolis—any aircraft attached to.....	NVMBD	.....	O	.....	Do.
Louisville—any aircraft attached to.....	NVMAH	.....	O	.....	Do.
Northampton—any aircraft attached to.....	NVMAN	.....	O	.....	Do.
Pensacola—any aircraft attached to.....	NVMAU	.....	O	.....	Do.
Salt Lake City—any aircraft attached to.....	NVMAP	.....	O	.....	Do.

Government aircraft stations, alphabetically, by call signals

Call signal	Name of station	Call signal	Name of station
NVMAF	Augusta—any aircraft attached to.....	NVMAN	Northampton—any aircraft attached to.....
NVMAG	Chicago—any aircraft attached to.....	NVMAP	Salt Lake City—any aircraft attached to.....
NVMAH	Louisville—any aircraft attached to.....	NVMAU	Pensacola—any aircraft attached to.....
NVMAL	Houston—any aircraft attached to.....	NVMBD	Indianapolis—any aircraft attached to.....
NVMAM	Chester—any aircraft attached to.....		

Marine radiobeacon stations

[Additions to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1929, and to the International List of Stations Performing Special Services published by the Berne bureau]

Cape Cod Light Station, Mass.—Loc. 70° 03' 37'' W., 42° 02' 23'' N.; transmits every 180 seconds groups of 2 dashes and 1 dot for 60 seconds, silent 120 seconds, thus:

--- . --- . etc.	Silent
60 seconds	120 seconds

Fy., 305 (984); hours, continuously during thick or foggy weather and daily in clear weather from 1 to 1.30 and 7 to 7.30 a. m. and p. m., seventy-fifth meridian time.

Sturgeon Bay Canal Light Station, Mich.—Loc. 87° 18' 45'' W., 44° 47' 40'' N.; transmits every 180 seconds groups of 3 dashes and 1 dot for 60 seconds, silent 120 seconds, thus:

--- . --- . etc.	Silent
60 seconds	120 seconds

Fy., 314 (955); hours, continuously during thick or foggy weather and daily in clear weather for the last 15 minutes of each hour.

Kewaunee Pierhead Light Station, Mich.—Loc. 87° 29' 30'' W., 44° 27' 30'' N.; transmits every 180 seconds groups of 2 dashes and 1 dot for 60 seconds, silent 120 seconds, thus:

--- . --- . etc.	Silent
60 seconds	120 seconds

Fy., 286 (1,048); hours, continuously during thick or foggy weather and daily in clear weather for the last 15 minutes of each hour.

Experimental stations, alphabetically, by names of stations

[Additions to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1929]

Station	Call signal	Frequency in kilocycles, meters in parentheses	Power (watts)	Owner
California: Alameda	W6XL	1,604 (187.03), 2,398 (125.1), 3,256 (92.5), 4,795 (62.57), 6,425 (46.7), 8,650 (34.68), 12,850 (23.35), 17,300 (17.34).	5,000	Federal Telegraph Co.
Maine: Bradley	W1XQ	50 (6,000) to 75 (4,000)	25,000	American Telephone & Telegraph Co.
Massachusetts: South Dartmouth	W1XP	1,604 (187.03), 2,398 (125.1), 3,256 (92.5), 4,795 (62.57), 6,425 (46.7).	1,000	Massachusetts Institute of Technology.
New York: Garden City	W2XBG	1,604 (187.03), 2,398 (125.1), 3,256 (92.5), 4,795 (62.57), 6,425 (46.7), 8,650 (34.68).	200	R. M. C. A.
Schenectady	W2XAE	240 (1,250)	5,000	General Electric Co.
Pennsylvania: Phila- delphia	W3XM	6,425 (46.69), 8,650 (34.68)	500	Durham & Co. (Inc.), 2,006 Chestnut Street.
Washington: Seattle	W7XP	1,596 (188), 2,416 (124.17)	500	Seattle fire and police depart- ment.
<i>Portable</i>				
California No. 1	W6XF	1,604 (187.03), 2,398 (125.1), 3,256 (92.5), 4,795 (62.57), 6,425 (46.7), 8,650 (34.68), 12,850 (23.35), 17,300 (17.34), 30,100 (9.97), 35,100 (8.55), 40,100 (7.48), 50,100 (5.98).	500	Heintz & Kaufman (Inc.), 311 California Street, San Francisco, Calif.
California No. 2	W6XJ	do	500	Do.
Illinois: Chicago	W9XAH	1,490 (201.3)	500	Peoples Pulpit Association, 111 East Pearson Street.
Ohio	W8XG	1,604 (187.03), 2,398 (125.1), 3,256 (92.5), 4,795 (62.57), 6,425 (46.7), 8,650 (34.68), 12,850 (23.35), 17,300 (17.34).	200	Ohio State University, de- partment of electrical engi- neering, Columbus, Ohio.

Visual broadcasting stations, alphabetically, by names of stations

[Additions to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1929]

Station	Call signal	Frequency in kilocycles, meters in parentheses	Power (watts)	Owner
New York: Long Island City.	W2XBO	2,000 (150) to 2,100 (142.9), 2,760 (109.1) to 2,850 (105.3).	5,000	United Research Corporation, 39 Van Pelt Avenue.
Pennsylvania: East Pittsburgh.	W8XT	660 (455)-----	25,000	Westinghouse Electric & Manufacturing Co.

Experimental, relay broadcasting, and visual broadcasting stations grouped by districts, alphabetically, by call signals

Call signal	District and station	Call signal	District and station
W1XP W1XQ	First district: South Dartmouth, Mass. Bradley, Me.	W6XF W6XJ W6XL W7XP	Sixth district: California No. 1. California No. 2. Alameda, Calif.
W2XAE W2XBG W2XBO W3XM	Second district: Schenectady, N. Y. Garden City, N. Y. Long Island City, N. Y. Third district: Philadelphia, Pa.	W8XG W8XT W9XAH	Seventh district: Seattle, Wash. Eighth district: Ohio. East Pittsburgh, Pa. Ninth district: Chicago, Ill.

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, 1929, and to the International List of Fixed and Land Stations, published by the Berne bureau]

- BAYTOWN, TEX.—Fy., strike out 438 (685); add 418 (717.7); owner, R. M. C. A.
- BOLINAS, CALIF., Radio (KPH).—Fy., strike out 8,430 (35.59); add 8,350 (35.93).
- CAMIGUIN ISLAND, P. I.—Owner, Mambit Lumber Co.
- CHIGNIK, ALASKA (KNP).—*Read* Chignik, Alaska Radio; loc. (approximate) 150° 23' 00'' W., 56° 17' 00'' N.; type, A1, A2; fy., 252 (1,190), 262 (1,145), 272 (1,105), 425 (705), 500 (600); service, add PG.
- CLEVELAND, OHIO (WTL).—Hours, N.
- DALLAS (LOVE FIELD), TEX. (KGUF).—Fy., strike out 5,660 (53); add 5,600 (53.57); hours, 7 a. m. to 9 p. m. daily.
- EGEGIK, ALASKA.—*Read* Egegik, Alaska Radio; type, A1; fy., 256 (1,170), 272 (1,105), 460 (650), 500 (600); service, add PG.
- EKUK, ALASKA.—Loc. (approximate) 158° 31' 00'' W., 58° 42' 00'' N.; type, A1; fy., 256 (1,170), 272 (1,105).
- ENSENADA, P. R., Radio.—Power, M/amp. 48/11.5.
- FALSE PASS, ALASKA.—*Read* False Pass, Alaska Radio; type, A2; fy., 193 (1,555), 252 (1,190), 425 (705), 500 (600); service, add PG.
- FORT MORGAN, ALA., Radio.—Fy., add 8,550 (35.09).
- HIALEAH, FLA., Radio.—Fy., add 5,525 (54.3), 6,665 (45), 8,490 (35.34), 11,050 (27.15), 13,180 (22.76), 16,580 (18.094), 22,100 (13.575), 22,280 (13.465).
- INDEPENDENCE, CALIF.—Fy., strike out 3,160 (94.9), 3,166 (94.8), 3,172 (94.6); power, M/amp. 9.23/2.
- KENAI, ALASKA (KYZ).—*Read* Kenai, Alaska Radio; type, A1; fy., 212 (1,415), 219 (1,370), 460 (650), 500 (600); service, add PG.
- KOGGIUNG, ALASKA.—*Read* Koggiung, Alaska Radio; type, A1; fy., 256 (1,170), 272 (1,105), 460 (650), 500 (600); service, add PG; hours, X.
- L. McN. & L. VI No. 1 (permanently moored vessel in Kvichak River, Bristol Bay, Alaska).—Loc. (approximate) 157° 00' 00'' W., 58° 51' 00'' N.; type, A1; fy., 256 (1,170), 272 (1,105).
- AIBBYVILLE, ALASKA, Radio.—Loc. (approximate) 157° 03' 00'' W., 58° 47' 00'' N.; type, add A1; fy., add 219 (1,370), 256 (1,170), 272 (1,105), 333 (900), 425 (705); service, add FA; hours, X.

- LITTLE NECK, N. Y. (WJO).—Fy., 7,340 (40.87), 7,355 (40.79), 7,370 (40.71), 7,820 (38.36), 7,835 (38.29), 7,955 (37.72), 15,610 (19.218), 15,640 (19.182), 15,670 (19.145), 15,730 (19.072), 15,760 (19.036), 15,880 (18.892), 15,910 (18.856); hours, X.
- LITTLE NECK, N. Y. (WJP).—Fy., 7,340 (40.87), 7,355 (40.79), 7,370 (40.71), 7,820 (38.36), 7,835 (38.29), 7,955 (37.72), 15,610 (19.218), 15,640 (19.182), 15,670 (19.145), 15,730 (19.072), 15,760 (19.036), 15,880 (18.892), 15,910 (18.856); hours, X.
- LOCKANOK, ALASKA.—Type, A1; fy., 256 (1,170), 272 (1,105).
- LOS ANGELES, CALIF., Radio (KSM).—Fy., strike out 5,525 (54.298), 8,630 (34.76), 11,050 (27.15), 11,200 (26.79), 16,580 (18.094), 16,900 (17.75), 22,100 (13.575), 22,160 (13.538); add 460 (650), 500 (600), 8,445 (35.52), 11,370 (26.39), 16,890 (17.76).
- MANILA, P. I. (KUE).—Call changed to KZFM; fy., 4,825 (62.17).
- MARION, MASS., Radio (WCC).—Fy., strike out 8,350 (35.93), add 8,430 (35.59).
- MIAMI (DINNER KEY), FLA. (WGF).—Fy., add 278 (1,080); power, M/amp. 21.3/2; hours, N.
- NEW LONDON, CONN., Radio.—Type, A2; fy., strike out 476 (630), add 408 (735).
- NEW ORLEANS, LA. (WJF).—Fy., 7,340 (40.87), 7,355 (40.79), 7,370 (40.71), 7,820 (38.36), 7,835 (38.29), 7,955 (37.72), 15,610 (19.218), 15,640 (19.182), 15,670 (19.145), 15,730 (19.072), 15,760 (19.036), 15,880 (18.892), 15,910 (18.856); hours, X.
- NEW ORLEANS (MENELEE AIRPORT), LA. (WQDQ).—Hours, 7 a. m. to 9 p. m. daily.
- NUSHAGAK, ALASKA (KLJ).—*Read* Nushagak, Alaska Radio; type, A1, A2; fy., 262 (1,145), 272 (1,105), 425 (705), 500 (600); service, add PG.
- NUSHAGAK, ALASKA (KNO).—*Read* Nushagak, Alaska Radio; loc. (approximate) 158° 27' 00" W., 58° 57' 00" N.; type, A1; fy., 256 (1,170), 272 (1,105), 460 (650), 500 (600); service, add PG.
- PHILADELPHIA, PA. (WJG).—Fy., 7,340 (40.87), 7,355 (40.79), 7,370 (40.71), 7,820 (38.36), 7,835 (38.29), 7,955 (37.72), 15,610 (19.218), 15,640 (19.182), 15,670 (19.145), 15,730 (19.072), 15,760 (19.036), 15,880 (18.892), 15,910 (18.856); hours, X.
- PORTLAND, OREG., Radio (KKB).—Fy., strike out 5,525 (54.298), 8,630 (34.76), 11,050 (27.15), 11,200 (26.79), 16,580 (18.094), add 460 (650), 500 (600), 8,445 (35.52), 11,370 (26.39), 16,890 (17.76).
- ROGERS CITY, MICH., Radio.—Fy., strike out 143 (2,100), 171 (1,755).
- SAN FRANCISCO, CALIF. (KOP).—Fy., 7,340 (40.87), 7,355 (40.79), 7,370 (40.71), 7,820 (38.36), 7,835 (38.29), 7,955 (37.72), 15,610 (19.218), 15,640 (19.182), 15,670 (19.145), 15,730 (19.072), 15,760 (19.036), 15,880 (18.892), 15,910 (18.856).
- SAN JUAN, P. R. (Pan American Airport) (WMDU).—Fy., add 8,015 (37.43).
- SANTA MARIA, CALIF. (KGKD).—Fy., strike out 1,616 (185.64), 2,344 (127.986), 4,785 (62.695); add 278 (1,080); power, M/amp. 24.4/2.7; hours, X.
- SEATTLE, WASH. Radio (KSA).—Fy., strike out 5,525 (54.298), 8,630 (34.76), 11,050 (27.15), 11,200 (26.79), 16,580 (18.094), 16,900 (17.751); add 460 (650), 500 (600), 8,445 (35.52), 11,370 (26.39), 16,890 (17.76).
- SIPACO, P. I.—Call changed to KZFN; fy., 4,825 (62.17).
- TAKU HARBOR, ALASKA.—*Read* Taku, Alaska Radio; loc. (approximate) 134° 01' 00" W., 58° 04' 00" N.; type, A1; fy., 220 (1,365), 246 (1,220), 460 (650), 500 (600); service, add PG.
- TENAKEE, ALASKA.—*Read* Tenakee, Alaska Radio; fy., 246 (1,220), 460 (650), 500 (600), 3,172 (94.57); power, M/amp. 15.4/2; service, add PG.
- WACO (MUNICIPAL AIRPORT), TEX.—Hours, 7 a. m. to 9 p. m. daily.
- WASHINGTON, D. C. (WJM).—Fy., 7,340 (40.87), 7,355 (40.79), 7,370 (40.71), 7,820 (38.36), 7,835 (38.29), 7,955 (37.72), 15,610 (19.218), 15,640 (19.182), 15,670 (19.145), 15,730 (19.072), 15,760 (19.036), 15,880 (18.892), 15,910 (18.856); hours, X.
- YAKUTAT, ALASKA.—*Read* Yakutat, Alaska Radio; loc. (approximate) 139° 44' 00" W., 59° 32' 00" N.; type, A1; fy., 220 (1,365), 272 (1,105), 460 (650), 500 (600); service, add PG.

Portable

- TEXAS, LOUISIANA AND OKLAHOMA No. 2.—Fy., add 1,600 (187.5), 1,652 (181.6), 1,664 (180.29), 1,680 (178.6).
- TEXAS, LOUISIANA AND OKLAHOMA No. 3.—Fy., add 1,600 (187.5), 1,652 (181.6), 1,664 (180.29), 1,680 (178.6).

- TEXAS, LOUISIANA AND OKLAHOMA No. 4.—Fy., add 1,600 (187.5), 1,652 (181.6), 1,664 (180.29), 1,680 (178.6).
- TEXAS, LOUISIANA AND OKLAHOMA No. 5.—Fy., add 1,600 (187.5), 1,652 (181.6), 1,664 (180.29), 1,680 (178.6).
- TEXAS, LOUISIANA AND OKLAHOMA No. 6.—Fy., add 1,600 (187.5), 1,652 (181.6), 1,664 (180.29), 1,680 (178.6).
- TEXAS, LOUISIANA AND OKLAHOMA No. 7.—Fy., add 1,600 (187.5), 1,652 (181.6), 1,664 (180.29), 1,680 (178.6).
- TEXAS, LOUISIANA AND OKLAHOMA No. 8.—Fy., add 1,600 (187.5), 1,652 (181.6), 1,664 (180.29), 1,680 (178.6).
- TEXAS, LOUISIANA AND OKLAHOMA No. 9.—Fy., add 1,600 (187.5), 1,652 (181.6), 1,664 (180.29), 1,680 (178.6).
- TEXAS, LOUISIANA AND OKLAHOMA No. 10.—Fy., add 1,600 (187.5), 1,652 (181.6), 1,664 (180.29), 1,680 (178.6).
- TEXAS, LOUISIANA AND OKLAHOMA No. 11.—Fy., add 1,600 (187.5), 1,652 (181.6), 1,664 (180.29), 1,680 (178.6).
- Strike out all particulars of the following-named stations: Candle, Alaska; El Paso, Tex. (KGKA); Kukak Bay, Alaska; Kusilof, Alaska; Limay, P. I.; Phoenix, Ariz. (KGKC); Port Graham, Alaska; Raspberry Island, Alaska; Siginaka Island, Alaska; Seventh Radio District (portable).

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, 1929, and to the International List of Ship Stations, published by the Berne bureau]

- A. & P. NAKEN No. 7.—Fy., 2,320 (129.3); power, M/amp. 11.5/2.5.
- ADAM E. CORNELIUS.—Power, M/amp. 25/6.
- ADMIRAL WILEY.—Accounts, M. R. T. Co.
- ALBAY.—Fy., 396.8 (756).
- ALL AMERICA.—Power, M/amp. 23/4; accounts, M. R. T. Co.
- AMERICAN LEGION.—Fy., strike out 137 (2,190), 141 (2,130); power, M/amp. 30/15.
- AMERICAN MERCHANT.—Power, M/amp. 24/16; accounts, R. M. C. A.
- AMIDA.—Fy., strike out 155 (1,935); add 5,525 (54.3), 5,555 (54), 8,290 (36.19), 8,450 (35.5), 11,050 (27.15), 11,110 (27), 11,230 (26.71), 13,240 (22.66).
- ARDEN.—Type, A arc and B; fy., 143 (2,100), 151 (1,985), 153 (1,960), 157 (1,910), 160 (1,875), 375 (800), 425 (705), 500 (600); power, M/amp. 22/11; accounts, R. M. C. A.
- ARGOSY.—Fy., strike out 420 (715), 454 (660); power, M/amp. 24/16.
- ATLANTIC.—Type, A1; fy., 5,525 (54.3), 5,555 (54), 8,290 (36.19), 11,050 (27.15), 11,110 (27); service, P; hours, X.
- BARREDO.—Accounts, R. M. C. A. (U. S. L.).
- BATON ROUGE.—Fy., strike out 273 (1,100); add 274 (1,095), 375 (800), 500 (600); power, M/amp. 13.85/11.
- BEACONIL.—Type, strike out B, add A1, A2; fy., add 143 (2,100), 151 (1,985), 160 (1,875), 400 (750); power, M/amp. 30/10.
- BETTY R.—Fy., strike out 2,740 (109.5), 3,420 (87.7), add 375 (800), 425 (705), 8,330 (36.01); power, M/amp. 8.5/2.5.
- BIRMINGHAM.—Fy., strike out 273 (1,100), add 274 (1,095), 375 (800), 500 (600); power, M/amp. 10.77/8.
- BIRMINGHAM CITY.—Power, M/amp. 30/12.
- BROAD ARROW.—Type, add A1; power, M/amp. 27/11.
- BYLAYL.—Type, strike out A1; power, M/amp. 25/6.
- CAIRO.—Fy., strike out 273 (1,100), add 274 (1,095), 375 (800), 500 (600); power, M/amp. 13.85/11.
- CAMPEADOR.—Owner, Visayan Stevedore Transportation Co.
- CAPITAN LUIS.—Fy., add 429 (700).
- CARRISO.—Fy., add 454 (660); power, M/amp. 21/14.
- C. C. WEBBER.—Fy., strike out 273 (1,099), add 274 (1,095), 375 (800); power, M/amp. 12.31/11.
- CEBU (KZAX).—Fy., 444.4 (675), 500 (600); hours, 7 to 12 a. m., 2 to 5 p. m., 7 to 10.30 p. m.
- CHARLES M. SCHWAB.—Fy., strike out 155 (1,935), 394 (760), add 157 (1,910); power, M/amp. 12/10.
- CITY OF CLEVELAND III.—Type, add B; power, M/amp. 16/5.

- CITY OF FAIRBURY.—Power, M/amp. 16/16.
- CITY OF NEW YORK (WQDC).—Type, A1, A2; fy., add 143 (2,100), 151 (1,985), 153 (1,960), 157 (1,910), 159 (1,885), 160 (1,875), 375 (800), 400 (750), 425 (705), 468 (640), 500 (600); power, M/amp. 25.9/14.8.
- CITY OF SAN FRANCISCO.—Type, A1, A2; fy., 375 (800), 410 (730), 425 (705), 454 (660), 468 (640), 500 (600), 5,525 (54.3), 5,555 (54), 8,290 (36.19), 8,450 (35.5), 11,050 (27.15), 11,230 (26.71), 13,240 (22.66), 16,580 (18.094), 16,660 (18.007); power, M/amp. 28/5 and 1.5; hours, N.
- COLOMBIA.—Fy., strike out 125 (2,400), 137 (2,190), add 410 (730), 5,525 (54.3), 5,555 (54), 8,290 (36.19), 8,450 (35.5), 11,050 (27.15), 11,230 (26.71), 13,240 (22.66), 16,580 (18.094), 16,660 (18.007); power, M/amp. 23/10 and 1.5.
- CORDOVA (KFMF).—Fy., strike out 273 (1,100); add 274 (1,095), 375 (800), 500 (600); power, M/amp. 10.77/11.
- CORNORE.—Type, A1, A2; fy., 143 (2,100), 151 (1,985), 160 (1,875), 375 (800), 400 (750), 425 (705), 500 (600); power, M/amp. 25/10.
- DAVID McKELVY.—Type, add A1; power, M/amp. 26/10.
- DIAMOND HEAD.—Type, add A1, A2; fy., add 468 (640); power, M/amp. 25/12; hours, N.
- DON JUAN O.—Fy., add 455 (660).
- DOROTHY (KMIE).—Owner, A. H. Bull S. S. Co.
- EL SALVADOR.—Type, add A1; fy., add 5,525 (54.3), 5,555 (54), 8,290 (36.19), 8,450 (35.5), 11,050 (27.15), 11,230 (26.71), 13,240 (22.66), 16,580 (18.094), 16,660 (18.007); power, M/amp. 24/11 and 1.5.
- ESPARTA.—Power, M/amp. 30/7; hours, N.
- EXCHANGE.—Fy., strike out 410 (730); power, M/amp. 26/15; hours, add N.
- FAVORITE (KDNV).—Type, A1, A2; fy., add 125 (2,400), 167 (1,795), 375 (800); service, PG; hours, X; rates, 8 cents per word.
- FAVORITE (KIFG).—Fy., strike out 394 (760); power, M/amp. 13/6.
- FERNANDEZ HERMANOS.—Fy., add 396.8 (756); hours, 7 to 12 a. m., 2 to 10 p. m.
- F. ESCANO.—Fy., add 429 (700).
- F. F. F.—Type, A1; fy., 5,525 (54.3), 5,555 (54), 8,330 (36.01), 11,050 (27.15), 11,110 (27); service, P; hours, X.
- F. J. WILLIAMS.—Type, add A1; power, M/amp. 28/11.
- FORBES HAUPTMAN.—Power, M/amp. 22.85/18.
- FORTUNA (KDWF).—Type, add A1, A3; fy., add 5,525 (54.3), 5,555 (54), 5,615 (53.42), 6,590 (45.52), 6,605 (45.42), 8,290 (36.19), 8,330 (36.01), 11,050 (27.15), 11,110 (27), 11,230 (26.71), 13,240 (22.66), 16,580 (18.094), 16,660 (18.007), 16,860 (17.794), 22,100 (13.575), 22,220 (13.501), 22,460 (13.357); power, M/amp. 18/5; accounts, owner.
- FRANK H. GOODYEAR.—Power, M/amp. 25/6.5.
- FREEPORT SULPHUR No. 5.—Type, add A1; power, M/amp. 24/11.
- GADFLY II.—Type, A1, A2; fy., strike out 143 (2,100), 151 (1,985), 410 (730), 11,230 (26.71); add 11,110 (27); power, M/amp. 33/3.5 and 0.5; service, P; hours, X; accounts, owner.
- GEORGE H. INGALLS.—Power, M/amp. 25/6.
- G. J. GRAMMER.—Fy., add 375 (800); power, M/amp. 25/6.
- GRECIAN.—Power, M/amp. 25/5; hours, X.
- GUARDIAN.—Power, M/amp. 23/2.7; accounts, M. R. T. Co.
- GULFPORT.—Fy., strike out 273 (1,100), add 274 (1,095), 375 (800), 500 (600); power, M/amp. 10.77/8.
- HARRY YATES.—Power, M/amp. 25/6.
- JIMMIE K.—Type, A3; fy., 2,524 (118.85), 2,560 (117.18), 2,594 (115.65); power, M/amp. 7/1.5; service, strike out PG, add P.
- JOHN J. BOLAND.—Power, M/amp. 25/6.5.
- JOLO.—Hours, 8 to 12 a. m., 1 to 1.30 and 3 to 10.30 p. m.
- JOSEPHINE.—Power, M/amp. 10/8.
- KITTIWAKE.—Type, A1; fy., 425 (705), 454 (660), 468 (640), 500 (600); power, M/amp. 13/1.5; service, PG; hours, X; rates, 8 cents per word; accounts, owner.
- LA PERLA.—Type, strike out B; fy., strike out 125 (2,400), 137 (2,190), 141 (2,130), 145 (2,070), 147 (2,040), 149 (2,015), add 160 (1,875); power, M/amp. 30/12; hours, N.
- LUMBERMAN.—Fy., add 454 (660); power, M/amp. 20/6.
- MACTAN.—Hours, 7 to 12 a. m., 2 to 6 and 7 to 10.30 p. m.
- MAIDEN CREEK.—Power, M/amp. 24/10.
- MALOLO LIFEBOAT No. 1.—Type, B; fy., 500 (600); power, M/amp. 6/2; service, P; hours, X.

- MALOLO LIFEBOAT No. 2.—Type, B; fy., 500 (600); power, M/amp. 6/2; service, P; hours, X.
- MARJ III.—Fy., strike out 394 (760); power, M/amp. 7/10 and 1.
- MARJORY WEEMS.—Type, B; fy., 375 (800), 425 (705), 500 (600); power, M/amp. 20/11; accounts, owner.
- MAZAMA.—Type, strike out B, and A2; power, M/amp. 23.08/1; hours, strike out X, add N.
- MICHAEL TRACY.—Power, M/amp. 30/8.
- MISSOULA.—Power, M/amp. 20/8.
- MISSOURI (WFDT).—Fy., strike out 273 (1,100), add 274 (1,095), 375 (800), 500 (600); power, M/amp. 13.85/15.
- MIZPAH.—Fy., strike out 155 (1,935), 454 (660), 5,615 (53.43), 8,330 (36.01); add 8,290 (36.19), 8,450 (35.50), 11,050 (27.15), 11,110 (27), variable.
- MONTANES.—Fy., strike out 630 (476), add 396.8 (756).
- MONTGOMERY CITY.—Power, M/amp. 24/12.
- MORRIS S. TREMAINE.—Power, M/amp. 25/6.
- MOUNT BAKER.—Power, M/amp. 25/3.
- MUNAMAR.—Type, strike out B, add A1, A2; fy., strike out 137 (2,190), 141 (2,130), 157 (1,910), 410 (730), 454 (660), add 400 (750); power, M/amp. 30/8.
- MUNCOVE.—Power, M/amp. 25/8.
- MUNDIXIE.—Power, M/amp. 22/5.
- MUNRIO.—Power, M/amp. 26/8.
- NEMAHA.—Power, M/amp. 20/15.
- NEPTUNE.—Type, A2; fy., 375 (800), 425 (705), 468 (640), 500 (600); power, M/amp. 18/6.
- NOSA CHIEF.—Power, M/amp. 20/12.
- NTRA. SRA DE ALBA.—Fy., add 462 (650).
- NTRA. SRA DE LA PAZ.—Fy., strike out 375 (800), 315 (952), add 396.8 (756).
- OAKLEY L. ALEXANDER.—Type, A2; fy., strike out 137 (2,190), 141 (2,130), add 410 (730), 454 (660); power, M/amp. 30/13.
- OREGON (KUJZ).—Power, M/amp. 25/10.
- PALAWAM.—Fy., add 455 (659).
- PATRIA.—Type, A1; fy., 5,525 (54.3), 5,555 (54), 8,290 (36.19), 11,050 (27.15), 11,110 (27); service, P; hours, X.
- PECOS.—Fy., strike out 410 (730), 454 (660); power, M/amp. 28/4.
- PENOBSCOT.—Power, M/amp. 25/6.
- PLYMOUTH (WRCH).—Power, M/amp. 15/4.
- POINT FERMIN.—Accounts, R. M. C. A.
- POINT MONTARA.—Accounts, R. M. C. A.
- POINT SAN PABLO.—Accounts, R. M. C. A.
- POINT SAN PEDRO.—Accounts, R. M. C. A.
- PRESIDENT PIERCE.—Fy., 143 (2,100), 151 (1,985), 153 (1,960), 155 (1,935), 157 (1,910), 159 (1,885), 160 (1,875), 375 (800), 410 (730), 425 (705), 454 (660), 500 (600); power, M/amp. 17/11.
- PRESIDENT TAFT.—Fy., 143 (2,100), 151 (1,985), 153 (1,960), 155 (1,935), 157 (1,910), 159 (1,885), 160 (1,875), 375 (800), 410 (730), 425 (705), 500 (600), 5,525 (54.3), 5,555 (54), 5,615 (53.42), 6,605 (45.42), 6,620 (45.32), 8,290 (36.19), 8,330 (36.01), 11,050 (27.15), 11,110 (27), 11,230 (26.71), 13,240 (22.66), 16,580 (18.094), 16,660 (18.007), 16,860 (17.794), 22,100 (13.575), 22,220 (13.501), 22,460 (13.357); power, M/amp. 17/3 and 16.
- PRINCETON (KDLU).—Type, add A1; power, M/amp. 20/5.
- PROVIDENCE (KUTV).—Type, B; fy., 375 (800), 425 (705), 500 (600); hours, X.
- PROVIDENCE (WRCJ).—Power, M/amp. 16/5.
- PUEBLO.—Power, M/amp. 28/10.
- REDONDO.—Accounts, owner.
- ROBERT LUCKENBACH.—Fy., strike out 410 (730), 454 (660); power, M/amp. 24/16.
- SAGUACHE.—Power, M/amp. 16/16.
- ST. LOUIS.—Fy., strike out 273 (1,100), add 274 (1,095), 375 (800), 500 (600); power, M/amp. 45/11.
- SAN ISIDRO.—Fy., add 429 (700).
- SAN MATEO.—Fy., strike out 125 (2,400), 137 (2,190), 141 (2,130); power, M/amp. 30/12; hours, strike out X.
- SANTO DOMINGO.—Fy., strike out 397 (756), add 429 (700).
- SARCOXIE.—Fy., strike out 410 (730), 454 (660); power, M/amp. 26/16.

- SEABORN.—Type, strike out B, add A2; fy., 143 (2,100), 151 (1,985), 153 (1,960), 155 (1,935), 157 (1,910), 159 (1,885), 160 (1,875), 375 (800), 400 (750), 468 (640), 500 (600), 5,525 (54.3), 8,290 (36.19), 8,330 (36.01), 11,050 (27.15), 11,110 (27), 11,230 (26.71), 13,240 (22.66), 16,580 (18.094), 22,100 (13.575); power, M/amp. 17/2 and 9; accounts, R. M. C. A.
- SHOOTERS ISLAND.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 468 (640), 500 (600); power, M/amp. 26/6.
- SOUTHERN TRADER.—Fy., add 429 (700).
- S. S. THORPE.—Fy., strike out 273 (1,100), add 274 (1,095), 375 (800); power, M/amp. 12.31/11.
- STANDARD ARROW.—Type, strike out A1; fy., add 400 (750), 468 (640); power, M/amp. 27/10.
- STELLA LYKES.—Type, strike out B; add A2; fy., add 400 (750), 468 (640).
- STEPHEN M. CLEMENT.—Fy., add 375 (800); power, M/amp. 25/6.5.
- SYLVAN ARROW.—Power, M/amp. 22/7.
- TASHMOO.—Fy., add 454 (660); power, M/amp. 21/10.
- TEXAS (KEFZ).—Type, add A2; fy., add 5,525 (54.3), 8,450 (35.50), 11,050 (27.15), 11,230 (26.71), 16,580 (18.094), 16,660 (18.007); power, M/amp. 24/12.
- THE ANGELES.—Power, M/amp. 25/16.
- THEODORE H. WICKWIRE.—Fy., add 375 (800); power, M/amp. 25/6.5.
- THEODORE H. WICKWIRE, Jr.—Fy., add 375 (800); power, M/amp. 25/6.5.
- THERMO.—Power, M/amp. 21.3/8.
- TRACY BROTHERS.—Fy., add 410 (730), 454 (660); power, M/amp. 18/7.
- ULISES.—Fy., add 400 (750).
- VENUS (KZAV).—Fy., 400 (750), 500 (600); hours, 7 to 12 a. m., 1 to 10.30 p. m.
- VIRGINIAN.—Power, M/amp. 27/11.
- WEST ARROW.—Power, M/amp. 28/12.
- WEST CELERON.—Power, M/amp. 20/10.
- WEST ELCASCO.—Power, M/amp. 21/18.
- WEST GRAMA.—Type, add A arc; fy., strike out 410 (730), 454 (660), add 143 (2,100), 151 (1,985), 153 (1,960), 157 (1,910), 159 (1,885), 160 (1,875); power, M/amp. 24/10.
- WEST HONAKER.—Power, M/amp. 20/9.
- WEST IRMO.—Power, M/amp. 24/14; accounts, R. M. C. A.
- WEST KYSKA.—Power, M/amp. 24/14.
- WEST NOHNO.—Power, M/amp. 26/16.
- WEST SELENE.—Power, M/amp. 30/18.
- WEST TOTANT.—Power, M/amp. 20/13.
- WEST ZEDA.—Power, M/amp. 26/18.
- WILLFARO.—Fy., strike out 410 (730), 454 (660); accounts, owner.
- WILLIAM T. ROBERTS.—Power, M/amp. 25/6.
- WINSTON SALEM.—Power, M/amp. 21/12.
- WINTHROP.—Type, A1, A2; fy., 375 (800), 400 (750), 425 (705), 468 (640), 500 (600); power, M/amp. 20/5.
- W. L. STREED.—Type, add A1; power, M/amp. 26/9.
- WYNOKA.—Fy., strike out 273 (1,100), add 274 (1,095), 375 (800), 500 (600); power, M/amp. 12.31/11.
- YALE (WTBT).—Type, add A1; power, M/amp. 20/5.
- YANKEE.—Type, A1, A2; fy., 375 (800), 400 (750), 425 (705), 468 (640), 500 (600); power, M/amp. 20/4.
- YANKEE ARROW.—Power, M/amp. 26/12.
- YOMACHICHI.—Fy., strike out 155 (1,935); power, M/amp. 26/10.
- YOUNGSTOWN (WPBH).—Fy., strike out 137 (2,190), 158 (1,900), 160 (1,875), 454 (660), add 153 (1,960), 155 (1,935), 157 (1,910), 394 (760); power, M/amp. 16/10.
- YUSINGCO.—Fy., 453 (662), 500 (600); hours, 8 to 12 a. m., 1 to 4 and 8 to 10 p. m.
- ZELDA.—Fy., strike out 400 (750), 468 (640), add 375 (800), 425 (705), 500 (600); power, M/amp. 20/5.
- Strike out all particulars of the following-named vessels: CASCO, HARRIET, NAKHODA, NAN B., PEGASUS, SIRIUS, TITANIA.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY, BY CALL SIGNALS

KJL, read False Pass, Alaska, Radio; KKA, read Yakutat, Alaska Radio; KLJ, read Nushagak, Alaska Radio; KNF, read Egegik, Alaska Radio; KNO, read Nushagak, Alaska Radio; KNP, read Chignik, Alaska Radio; KUE,

read KZFM; KUF, read KZFN; KVG, read Taku, Alaska Radio; KVV, read Koggiung, Alaska Radio; KYZ, read Kenai, Alaska Radio; strike out all particulars following the call signals: KDL, KFG, KGF, KGKA, KGKC, KGMT, KJP, KMQ, KUG, KXD, KZAH, KZCS, KZY, WBBS, WIDV, WKDZ, WPBR.

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, 1929, and to the International List of Aircraft Stations, published by the Berne bureau]

- CREOLE.—Type, A1; fy., 333 (900), 500 (600), 3,106 (96.58), 5,630 (53.29).
 F-1.—Read F-101; fy., add 3,460 (86.70).
 F-2.—Read F-102; fy., add 3,460 (86.70).
 F-3.—Read F-103; fy., add 3,460 (86.70).
 F-4.—Read F-104; fy., add 3,460 (86.70).
 F-5.—Read F-105; fy., add 3,460 (86.70).
 F-6.—Read F-106; fy., add 3,460 (86.70).
 F-7.—Read F-107; fy., add 3,460 (86.70).
 F-9.—Read F-109; fy., add 3,460 (86.70).
 F-10.—Read F-110; fy., add 3,460 (86.70).
 F-11.—Read F-111; fy., add 3,460 (86.70).
 F-12.—Read F-112; fy., add 3,460 (86.70).
 F-14.—Read F-114; fy., add 3,460 (86.70).
 F-15.—Read F-115; fy., add 3,460 (86.70).
 307-H.—Type, A2; fy., 333 (900), 375 (800), 500 (600), 3,106 (96.58).
 514-E.—Type, A2; fy., 333 (900), 375 (800), 500 (600), 3,106 (96.58).
 NC-106N.—Type, A1; fy., 333 (900), 500 (600), 2,662 (112.69), 3,070 (97.71), 3,106 (96.58), 5,690 (52.72).
 NC-306N.—Type, A1; fy., 333 (900), 414 (725), 500 (600), 2,662 (112.69), 3,070 (97.71), 3,106 (96.58), 5,690 (52.72), 8,015 (37.43).
 NC-309N.—Type, A1; fy., 333 (900), 414 (725), 500 (600), 2,662 (112.69), 3,070 (97.71), 3,106 (96.58), 5,690 (52.72).
 NC-967O.—Type, A1; fy., 333 (900), 414 (725), 500 (600), 2,662 (112.69), 3,070 (97.71), 3,106 (96.58), 5,690 (52.72).
 X-657M.—Type, A2; fy., 333 (900), 375 (800), 500 (600), 3,106 (96.58).

COMMERCIAL AIRCRAFT STATIONS, ALPHABETICALLY, BY CALL SIGNALS

KHAGT, read F-102; KHAIR, read F-103; KHAJQ, read F-101; KHCAZ, read F-104; KHCBY, read F-105; KHCCX, read F-106; KHCDW, read F-107; KHCFU, read F-109; KHCGT, read F-110; KHCHS, read F-111; KHCIR, read F-112; KHCKP, read F-115; KHCJQ, read F-114.

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, 1929, and the International List of Broadcasting Stations published by the Berne bureau]

- KDB (Santa Barbara, Calif.).—Owner, Dwight Faulding.
 KDLR (Devils Lake, N. Dak.).—Owner, KDLR, (Inc.).
 KFBB (Great Falls, Mont.).—Fy., 1,280 (234.4); power, 1,000 night, 2,500 day.
 KFIF (Portland, Oreg.).—Call changed to KBPS.
 KFIO (Spokane, Wash.).—Fy., 1,120 (267.9).
 KFJB (Marshalltown, Iowa).—Power, 100 night, 250 day.
 KFJK (Beverly Hills, Calif.).—Call changed to KMPC.
 KFJZ (Fort Worth, Tex.).—Owner, estate of H. C. Meacham.
 KFLV (Rockford, Ill.).—Owner, Rockford Broadcasters (Inc.).
 KGCI (San Antonio, Tex.).—Owner, Radio Sam Broadcast Co. (Inc.).
 KGDA (Dell Rapids, S. Dak.).—Owner, Mitchell Broadcasting Corporation.
 KGFV (Ravenna, Nebr.).—Power, 100.
 KGMC (Jerome, Ariz.).—Call changed to KCRJ.
 KGO (Oakland, Calif.).—Owner, National Broadcasting Co. (Inc.).
 KID (Idaho Falls, Idaho).—Power, 250 night, 500 day.
 KOA (Denver, Colo.).—Owner, National Broadcasting Co. (Inc.).
 KOMO (Seattle, Wash.).—Fy., 920 (326).
 KONO (San Antonio, Tex.).—Owner, Mission Broadcasting Co.
 KTRH (Houston, Tex.).—Fy., 1,120 (267.9); power, 500; address Rice Hotel.

- KVI (Des Moines, Wash.).—Notice of change in frequency in Radio Service Bulletin for last month incorrectly gave location as Des Moines, Iowa.
- KVL (Seattle, Wash.).—Owner, KVL (Inc.).
- KWEA (Shreveport, La.).—Owner, Hello World Broadcasting Corporation.
- KWKH (Shreveport, La.).—Owner, Hello World Broadcasting Corporation.
- WACO (Waco, Tex.).—Owner, Central Texas Broadcasting Co. (Inc.).
- WBBL (Richmond, Va.).—Fy., 1,210 (247.9).
- WCLB (Long Beach, N. Y.).—Call changed to WMIL.
- WCLO (Kenosha, Wis.).—Owner, WCLO Radio Corporation.
- WDAH (El Paso, Tex.).—Owner, Eagle Broadcasting Co.
- WEAL (Ithaca, N. Y.).—Power, 500 normally, 1,000 day experimentally.
- WEHC (Emory, Va.).—Fy., 1,200 (250.)
- WEHS (Evanston, Ill.).—Owner, WEHS, (Inc.).
- WFDW (Talladega, Ala.).—Fy., 1,420 (211.3); power, 100.
- WHDF (Calumet, Mich.).—Power, 100 night, 250 day.
- WIBS (Jersey City, N. J.).—Call changed to WHOM.
- WJBK (Ypsilanti, Mich.).—Owner, James F. Hopkins (Inc.).
- WJKS (Gary, Ind.).—Power, 1,000 night, 1,250 day.
- WKBF (Indianapolis, Ind.).—Loc. changed to Clermont, Ind.
- WKBP (Battle Creek, Mich.).—Call changed to WELL.
- WKRC (Cincinnati, Ohio).—Power, 500 normally, 1,000 experimentally.
- WMAN (Columbus, Ohio).—Owner, General Broadcasting Co.
- WMES (Boston, Mass.).—Call changed to WBBS.
- WMRJ (Jamaica, N. Y.).—Fy., 1,210 (247.9).
- WNBF (Binghamton, N. Y.).—Power, 100.
- WNBJ (Knoxville, Tenn.).—Stuart Broadcasting Corporation.
- WOPI (Bristol, Tenn.).—Owner, Radiophone Broadcasting Station WOPI (Inc.).
- WRAF (Laporte, Ind.).—Owner, Charles Middleton.
- WTNT (Nashville, Tenn.).—Fy., 1,470 (204.1).
- Strike out all particulars of the following-named stations: WBBW (Norfolk, Va.); WEAR (Cleveland, Ohio); WQBZ (Weirton, W. Va.); WRBC (Valparaiso, Ind.)

GOVERNMENT LAND STATIONS, ALPHABETICALLY, BY NAMES OF STATIONS

[Alteration and correction to be made to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1929, and to the International List of Fixed and Land Stations, published by the Berne bureau]

- ABERDEEN PROVING GROUNDS, MD.—Type, add A3; fy., strike out 275 (1,090), add 229 (1,310).
- BOLLING FIELD (ANACOSTIA), D. C.—Type, add A3.
- BOSTON, MASS. (WVO).—Type, add A2; fy., strike out 4,445 (67.5).
- BOWMAN FIELD (LOUISVILLE), KY.—Type, add A3.
- BURGESS FIELD (UNIONTOWN), PA.—Type, add A3.
- CAMP DEVENS (AYER), MASS.—Type, strike out A1, add A2.
- CAMP HARRY J. JONES (DOUGLAS), ARIZ.—Fy., strike out 275 (1,090), add 234 (1,280).
- CAMP KNOX, KY.—Type, strike out A1, add A2; fy., strike out 275 (1,090), add 232 (1,280).
- CAMP MARFA, TEX.—Name changed to Fort D. A. Russell, Tex.; type, add A2; fy., strike out 275 (1,090), add 234 (1,280).
- CAMP McCLELLAN (ANNISTON), ALA.—Type, strike out A1, add A2; fy., strike out 275 (1,090), add 232 (1,280).
- CAMP NICHOLS, P. I. (RIZAL).—Type, add A3.
- CAMP STEPHEN D. LITTLE (NOGALES), ARIZ.—Type, strike out 275 (1,090).
- CAMP STOTSENBERG, P. I.—Loc. (approximate) 120° 31' 00" E., 15° 11' 00" N.
- CHANUTE FIELD (RANTOUL), ILL.—Type, add A3.
- CHICAGO, ILL. (WVT).—Fy., strike out 220 (1,364), 6,990 (42.92), add 220 (1,365), 232 (1,280).
- CIRCLE, ALASKA.—Loc. (approximate) 144° 02' 00" W., 65° 04' 00" N.
- CLARK FIELD (CAMP STOTSENBERG), P. I.—Type, add A3.
- CORDOVA, ALASKA (WTU).—Type, add A2; fy., strike out 273 (1,100), add 272 (1,105).
- CRISSEY FIELD (PRESIDIO OF SAN FRANCISCO), CALIF.—Type, A1, A2, A3; fy., strike out 220 (1,364), add 220 (1,365).
- CUMBERLAND FIELD (CUMBERLAND), MD.—Type, add A3.

- DAVID NATIONAL AIRPORT, DAVID, R. P.—Type, A1; fy., 5,540 (54.15), 9,375 (32).
- DAYTON, OHIO.—Read Dayton, Ohio (Wright Field); type, add A3.
- DENVER, COLO.—Loc. (approximate) 105° 05' 00'' W., 39° 45' 00'' N.; type, strike out A1, add A2; fy., strike out 315 (950).
- DRYDEN, TEX.—Type, add A3.
- FAIRBANKS, ALASKA.—Fy., strike out 81 (3,704), add 81 (3,705).
- FORT ADAMS (NEWPORT), R. I.—Type, add A2, A3.
- FORT BARRANCAS (PENSACOLA), FLA.—Type, add A2, A3; fy., strike out 275 (1,090), add 232 (1,280).
- FORT BENJAMIN HARRISON (INDIANAPOLIS), IND.—Fy., strike out 192 (1,563), add 192 (1,565).
- FORT BLISS (EL PASO), TEX.—Type, add A2; fy., strike out 78 (3,840), add 78 (3,845).
- FORT BRADY (SAULT STE. MARIE), MICH.—Type, A2; fy., strike out 250 (1,200), add 210 (1,430).
- FORT BROWN (BROWNSVILLE), TEX.—Loc. (approximate) 97° 26' 00'' W., 25° 53' 00'' N.; fy., strike out 275 (1,090), add 234 (1,280).
- FORT CLARK (BRACKETTVILLE), TEX.—Fy., strike out 275 (1,090), add 234 (1,280).
- FORT CROCKETT (GALVESTON), TEX.—Loc. (approximate) 94° 49' 00'' W., 29° 16' 00'' N.; type, add A3; fy., strike out 275 (1,090), add 234 (1,280), 4,090 (73.35).
- FORT D. A. RUSSELL, WYO.—Name changed to Fort Francis E. Warren, Wyo.; fy., strike out 192 (1,567).
- FORT DE LESSEPS, CANAL ZONE.—Loc. (approximate) 79° 55' 00'' W., 9° 24' 00'' N.; fy., strike out 711 (420).
- FORT DOUGLAS (SALT LAKE CITY), UTAH.—Type, add A2; fy., strike out 192 (1,567), 4,030 (74.45), add 192 (1,565), 4,030 (74.44).
- FORT ETHAN ALLEN (ESSEX JUNCTION), VT.—Type, add A2, A3.
- FORT EUSTIS, VA.—Type, add A2, A3; fy., strike out 250 (1,200), 275 (1,090), add 210 (1,430), 229 (1,310).
- FORT GEORGE G. MEADE, MD.—Loc. (approximate) 76° 44' 00'' W., 39° 05' 00'' N.; fy., strike out 275 (1,090), add 229 (1,310).
- FORT GEORGE WRIGHT, WASH.—Type, strike out A1, add A2.
- FORT GIBBON (TANANA), ALASKA.—Loc. (approximate) 152° 05' 00'' W., 65° 10' 00'' N.; fy., strike out 525 (571), add 525 (570).
- FORT GRANT, CANAL ZONE.—Loc. (approximate) 79° 38' 00'' W., 8° 55' 00'' N.; type, A1, A2, A3; fy., strike out 173 (1,730), add 173 (1,735).
- FORT HANCOCK (HIGHLAND BEACH), N. J.—Type, add A2, A3; fy., strike out 275 (1,090), add 232 (1,280).
- FORT HAYES (COLUMBUS), OHIO.—Type, add A2; fy., strike out 212 (1,415), 6,990 (42.92), add 210 (1,430), 12,240 (24.51).
- FORT H. G. WRIGHT, N. Y.—Loc. (approximate) 72° 03' 00'' W., 41° 16' 00'' N.; type, add A2, A3.
- FORT HUACHUCA, ARIZ.—Type, add A2; fy., strike out 275 (1,090), add 234 (1,280).
- FORT KAMEHAMEHA (HONOLULU), HAWAII.—Type, add A2, A3; fy., strike out 185 (1,620), add 185 (1,625).
- FORT LEAVENWORTH (LEAVENWORTH), KANS.—Type, add A2; fy., strike out 72 (4,170), 4,305 (69.7), 4,375 (68.571), 8,750 (34.29), 13,125 (22.86), add 72 (4,165), 187 (1,605), 4,305 (69.69).
- FORT LEWIS, WASH.—Type, add A2; fy., strike out 220 (1,364), add 220 (1,365).
- FORT MCARTHUR, CALIF.—Read Fort MacArthur, Calif.; type, add A2, A3; fy., strike out 173 (1,730), add 173 (1,735).
- FORT MCINTOSH (LAREDO), TEX.—Loc. (approximate) 90° 30' 00'' W., 27° 30' 00'' N.; type, strike out A1, add A2; fy., strike out 275 (1,090), add 234 (1,280).
- FORT MCPHERSON, GA.—Fy., strike out 6,990 (42.92).
- FORT MILLS, P. I. (CORREGIDOR ISLAND).—Type, add A2, A3; fy., strike out 187 (1,600), 272 (1,100), add 187 (1,605), 272 (1,105).
- FORT MONMOUTH, N. J. (WTW).—Type, add A3; fy., strike out 185 (1,620), 275 (1,090), 6,990 (42.92), add 232 (1,280).
- FORT MONROE, VA.—Type, add A2, A3; fy., strike out 275 (1,090), add 229 (1,310).
- FORT OGLETHORPE, GA.—Fy., strike out 280 (1,071), add 232 (1,280).
- FORT OMAHA, NEBR.—Fy., strike out 173 (1,730), 6,990 (42.92), add 173 (1,735).
- FORT RANDOLPH, CANAL ZONE.—Type, add A2, A3; fy., strike out 1,110 (270.3), add 1,110 (270).

- FORT RILEY, KANS. (WUI).—Loc. (approximate) $96^{\circ} 46' 00''$ W., $39^{\circ} 03' 00''$ N.; type, add A2, A3; fy., strike out 200 (1,500), 250 (1,200), 4,430 (67.72), 8,860 (33.86), add 210 (1,430).
- FORT RINGGOLD, TEX.—Fy., strike out 275 (1,090), add 234 (1,280).
- FORT RUGER, HAWAII.—Type, add A2, A3; fy., strike out 185 (1,620), add 185 (1,625).
- FORT SAM HOUSTON (SAN ANTONIO), TEX.—Type, add A2; fy., strike out 275 (1,090), 6,990 (42.92), add 234 (1,280), 4,375 (68.57), 8,750 (34.29), 13,125 (22.86).
- FORT SHAFTER, HAWAII (HONOLULU).—Fy., strike out 185 (1,620), 8,160 (36.76), 12,240 (24.51), 16,320 (18.382), 20,425 (14.687), add 185 (1,625), 20,400 (14.706), 26,190 (11.455), 26,220 (11.442), 30,555 (9.818), 30,590 (9.807), 34,920 (8.591), 34,960 (8.581).
- FORT SHERMAN.—Type, add A2, A3.
- FORT SILL, OKLA.—Type, add A2, A3; fy., strike out 275 (1,090), 8,180 (36.67), add 234 (1,280).
- FORT STORY, VA.—Type, add A2, A3; fy., strike out 275 (1,090), add 229 (1,310).
- FORT THOMAS, KY.—Fy., strike out 275 (1,090), add 232 (1,280).
- FORT TOTTEN, N. Y.—Type, add A2, A3; fy., strike out 275 (1,090), add 232 (1,280).
- FORT WAYNE (BATTLE CREEK), MICH.—Loc. $85^{\circ} 05' 00''$ W., $42^{\circ} 17' 00''$ N.; type, strike out A1, add A2; fy., strike out 275 (1,090), add 232 (1,280).
- FORT MCKINLEY, P. I. (RIZAL).—Read Fort William McKinley, P. I. (Rizal); loc. (approximate), $121^{\circ} 00' 00''$ W., $14^{\circ} 31' 00''$ N.; type, A2; fy., strike out 4,305 (69.7), add 4,305 (69.69).
- FORT WINT, P. I. (GRANDE ISLAND).—Type, add A2, A3; fy., strike out 272 (1,100), add 272 (1,105).
- FRANCE FIELD, CANAL ZONE (CRISTOBAL).—Type, add A3.
- GOVERNORS ISLAND, N. Y.—Type, strike out A2, add A1; fy., strike out 275 (1,090), 6,990 (42.92), add 232 (1,280).
- HAINES, ALASKA.—Type, add A2; fy., strike out 284 (1,055), add 227 (1,320).
- HATBOX FIELD (MUSKOGEE), OKLA.—Type, add A3.
- JUNEAU, ALASKA.—Type, add A2.
- KELLY FIELD (SAN ANTONIO), TEX.—Type, add A3.
- KETCHIKAN, ALASKAN RADIO.—Loc. (approximate) $131^{\circ} 33' 00''$ W., $57^{\circ} 31' 00''$ N.; type add A2; fy., strike out 66 (4,550), 173 (1,734), 550.5 (545), 4,025 (74.5), 12,075 (24.85), 16,100 (18.634), 20,125 (14.92), add 66 (4,545), 173 (1,735), 550 (545), 4,025 (74.54), 4,310 (69.61), 8,620 (34.80), 12,930 (23.20).
- KINDLEY FIELD, P. I. (CORREGIDOR ISLAND).—Type, add A1, A3.
- KOTZEBUE, ALASKA.—Fy., strike out 689 (435.4), add 689 (435).
- LANGLEY FIELD (HAMPTON), VA.—Type, add A3; fy., strike out 275 (1,090), add 229 (1,310).
- LORDSBURG, N. MEX.—Type, add A1, A3.
- LOS ANGELES, CALIF. (WZH).—Loc. (approximate) $118^{\circ} 15' 00''$ W., $34^{\circ} 10' 00''$ N.; type, strike out A1, add A2.
- LOVE FIELD (DALLAS), TEX.—Loc. (approximate) $96^{\circ} 47' 00''$ W., $39^{\circ} 18' 00''$ N.; type, add A1, A3.
- LUKE FIELD (PEARL HARBOR), HAWAII.—Type, add A1, A3.
- MANILA (FORT SANTIAGO-LUZON), P. I.—Fy., add 26,250 (11.429), 26,280 (11.416), 30,625 (9.796), 30,660 (9.783), 35,000 (8.571), 35,040 (8.562), 39,375 (7.619).
- MARCH FIELD, CALIF.—Type, add A3; fy., strike out 220 (1,364), add 220 (1,365).
- MAXWELL FIELD, ALA.—Type, add A3.
- MIDDLETOWN, PA.—Type, add A1, A3; fy., strike out 275 (1,090), add 229 (1,310).
- MITCHELL FIELD, N. Y. (MINEOLA, L. I.).—Type, add A3; fy., add 232 (1,280).
- NEW ORLEANS, LA. (NAT).—Fy., strike out 104 (2,883), add 104 (2,885).
- NOME, ALASKA, RADIO.—Fy., strike out 83 (3,610), 280 (1,070), add 83 (3,615), 236 (1,270).
- NULATO, ALASKA.—Type, add A2; fy., 93.7 (3,203), 167 (1,800), 471 (637), add 93.7 (3,205), 166.6 (1,800), 471 (635).
- PEKING, CHINA.—Read Peiping, China.
- PETERSBURG, ALASKA.—Type, add A2; fy., strike out 266 (1,125), add 207 (1,450).
- PHILADELPHIA, PA. (fourth Naval reserve district).—Loc., changed to Camden, N. J. (fourth naval reserve district).
- POINT BARROW, ALASKA.—Type, add A2; fy., strike out 4,365 (68.7), add 4,365 (68.73).

- PORT AU PRINCE, HAITI, RADIO.—Fy., strike out 132 (2,271), add 132 (2,273).
- QUARRY HEIGHTS, CANAL ZONE.—Loc. (approximate) 79° 34' 00" W., 9° 59' 00" N.; type, A1; fy., strike out 4,365 (68.7), add 749 (400), 4,365 (68.73), 32,680 (9.177), 32,700 (9.174).
- ROCKWELL FIELD, CALIF. (CORONADO).—Type, add A3; fy., strike out 220 (1,364), add 220 (1,365).
- ST. LOUIS, MO. (WZK).—Loc. (approximate) 90° 34' 00" W., 38° 30' 00" N.; type, add A2.
- ST. THOMAS, VIRGIN ISLANDS, RADIO.—Fy., strike out 132 (2,271), add 132 (2,273).
- SAN FRANCISCO, CALIF. (Presidio of San Francisco).—Type, add A2; fy., strike out 173 (1,730), 4,030 (74.45), 6,990 (42.92), 8,600 (34.88), add 173 (1,735), 4,030 (74.44), 24,180 (12.407), 24,480 (12.255), 32,240 (9.305), 32,640 (9.191), 36,720 (8.169).
- SCHOFIELD BARRACKS, HAWAII.—Fy., strike out 185 (1,620), add 185 (1,625).
- SCOTT FIELD, ILL. (BELLEVILLE).—Type, add A1, A3.
- SEATTLE, WASH. (WVD).—Type, add A2; fy., strike out 4,085 (73.45), 8,170 (36.72), 8,740 (34.32), add 4,085 (73.44).
- SELFRIDGE FIELD, MICH. (MT. CLEMENS).—Type, add A3; fy., strike out 275 (1,090), add 232 (1,280).
- SEWARD, ALASKA, RADIO.—Loc. (approximate) 149° 24' 00" W., 60° 07' 00" N.; type, add A2, A3; fy., strike out 275 (1,090), 13,095 (22.91), add 232 (1,280), 8,740 (34.32), 13,110 (22.88).
- SITKA, ALASKA (WXC).—Type, add A2; fy., strike out 250 (1,200); add 203 (1,475), 210 (1,430).
- SKAGWAY, ALASKA.—Type, strike out A1, add A2; fy., add 4,380 (68.49), 8,760 (34.25), 13,140 (22.83).
- SQUAW HARBOR, ALASKA, RADIO (UNGA ISLAND).—Type, strike out A1, add A2; fy., strike out 4,365 (68.74), add 4,365 (68.73).
- TELLER, ALASKA.—Loc. (approximate) 166° 20' 00" W., 65° 17' 00" N.; type, strike out A2, add A1.
- TIENTSIN, CHINA.—Type, strike out A1, add A2.
- TUCSON, ARIZ.—Type, add A3.
- TUTUILA, SAMOA, RADIO.—Fy., 106 (2,830), 355 (845), 500 (600).
- VANCOUVER BARRACKS, WASH.—Type, add A2, A3; fy., strike out 220 (1,364), add 220 (1,365).
- WASHINGTON, D. C. (WAR).—Type, add A2; fy., strike out 4,225 (70.5), 6,990 (42.92), add 225 (1,335), 4,365 (68.73), 13,095 (22.91), 24,120 (12.438), 24,150 (12.422), 32,160 (9.328), 32,200 (9.317), 36,225 (8.208).
- WEST POINT, N. Y.—Fy., strike out 275 (1,090), add 232 (1,280).
- WHEELER FIELD, HAWAII (OAHU).—Type, add A2, A3; fy., strike out 185 (1,620), add 185 (1,625).
- WRANGELL, ALASKA.—Type, add A2; fy., strike out 258 (1,163), add 197 (1,525), 207 (1,450).
- YUMA, ARIZ.—Type, add A1, A3; fy., strike out 220 (1,364), add 220 (1,365).
- ZAMBOANGA, P. I. (PETTIT BARRACKS).—Loc. (approximate) 122° 04' 00" E., 6° 54' 00" N.; type, A2; fy., strike out 4,304 (69.7), add 4,305 (69.69).

Portable

- ATLANTIC COAST (WSP).—Fy., strike out 2,000 (150) to 2,256 (133), add 1,690 (177.5) to 1,700 (176.5), 2,490 (120.5) to 2,500 (120), 4,135 (72.55), 8,270 (36.28), 16,540 (18.138).
- ATLANTIC COAST (WSQ).—Fy., strike out 2,000 (150) to 2,256 (133), add 1,690 (177.5) to 1,700 (176.5), 2,490 (120.5) to 2,500 (120), 4,135 (72.55), 8,270 (36.28), 16,540 (18.138).
- ATLANTIC COAST (WSR).—Fy., strike out 2,000 (150) to 2,256 (133), add 1,690 (177.5) to 1,700 (176.5), 2,490 (120.5) to 2,500 (120), 4,135 (72.55), 8,270 (36.28), 16,540 (18.138).
- PACIFIC COAST (KVB).—Fy., strike out 2,000 (150) to 2,256 (133), add 1,690 (177.5) to 1,700 (176.5), 2,490 (120.5) to 2,500 (120), 4,135 (72.55), 8,270 (36.28), 16,540 (18.138).
- PACIFIC COAST (KVD).—Fy., strike out 2,000 (150) to 2,256 (133), add 1,690 (177.5) to 1,700 (176.5), 2,490 (120.5) to 2,500 (120), 4,135 (72.55), 8,270 (36.28), 16,540 (18.138).

- PACIFIC COAST (KVE).**—Fy., strike out 2,000 (150) to 2,256 (133), add 1,690 (177.5) to 1,700 (176.5), 2,490 (120.5) to 2,500 (120), 4,135 (72.55), 8,270 (36.28), 16,540 (18.138).
- PACIFIC COAST (KVH).**—Fy., strike out 2,000 (150) to 2,256 (133), add 1,690 (177.5) to 1,700 (176.5), 2,490 (120.5) to 2,500 (120), 4,135 (72.55), 8,270 (36.28), 16,540 (18.138).
- PACIFIC COAST (KVJ).**—Fy., strike out 2,000 (150) to 2,256 (133), add 1,690 (177.5) to 1,700 (176.5), 2,490 (120.5) to 2,500 (120), 4,135 (72.55), 8,270 (36.28), 16,540 (18.138).
- PACIFIC COAST (KVK).**—Fy., strike out 2,000 (150) to 2,256 (133), add 1,690 (177.5) to 1,700 (176.5), 2,490 (120.5) to 2,500 (120), 4,135 (72.55), 8,270 (36.28), 16,540 (18.138).

GOVERNMENT SHIP 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, 1929, and to the International List of Ship Stations, published by the Berne bureau]

ANTISTAM.—Read Antietam; strike out all particulars of the following-named vessels: *Commodore, Eagle 9, Eagle 13, Eagle 43, Eagle 53, Eagle 54, Huntington, Privateer, Saint Louis, S-51.*

GOVERNMENT, RADIOBEACON, RADIO-COMPASS LAND AND SHIP STATIONS ALPHABETICALLY BY CALL SIGNALS

NDM read Camden, N. J. (fourth Naval reserve district); **NIQL**, read S. C. 432 (U. S. L., p. 156); **NITL**, read Antietam; **NOTZ-S. C. 433**, read NOPZ (U. S. L., p. 157); **NPP**, read Peiping, China; **WTX**, read Fort William McKinley, P. I. (Rizal); **WUG**, read Fort D. A. Russell, Tex.; **WVW**, read Fort Francis E. Warren, Wyo.; **WYD**, read Dayton, Ohio (Wright Field); **WZW**, read Fort MacArthur, Calif.; strike out all particulars following the call signals **NEJM, NEJR, NENB, NIBP, NICD, NICE, NIFG, NIQK, NIRK, NUDF.**

MARINE RADIOBEACON STATIONS

[Alterations and corrections to be made to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1929, and to the International List of Stations Performing Special Services, published by the Berne bureau]

DETOUR LIGHT STATION, MICH.—Hours, will operate during the last 15 minutes of each hour of the day, regardless of weather conditions. Foggy and thick weather hours will not be changed. Diaphone fog signal and the radiobeacon are synchronized for distance-finding purposes. The method is the same as that at Whitefish Point Light Station, described hereunder.

WHITEFISH POINT LIGHT STATION, MICH.—The radiobeacon will operate during the last 15 minutes of each hour of the day, regardless of weather conditions. Foggy and thick weather hours will not be changed. Radiobeacon and diaphone fog signal are synchronized as follows: When both signals are being operated for fog or thick weather, a long dash will be transmitted at some time during each minute of radiobeacon transmission, so timed that the end of this dash marks the beginning of each repetition of the diaphone characteristic, which recurs at minute intervals. The dash is easily identified by reason of the fact that it is very much longer than any dash of the radiobeacon code. Masters of vessels equipped with a radio receiver capable of receiving at approximately 300 kilocycles (wave length, 1,000 meters), such as the receiver of a radio compass, may listen to the radiobeacon and, with a watch, note the time interval in seconds which elapses from the end of the long dash until the first sound of the diaphone is heard. Divide this interval by five and the result will be the approximate distance of the ship from the lighthouse in miles. This computation is based on the fact that radio transmission is practically instantaneous, and the speed of sound in air is approximately one mile in five seconds. The error will usually be not more than ten per cent of the total distance.

EXPERIMENTAL 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, 1929]

CALIFORNIA: Palo Alto (W6XV).—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), 12,850 (23.35), 17,300 (17.341), 24,100 (12.448), 25,100 (11.952), 27,100 (11.070), 30,100 (9.97), 75,100 (3.99).

MINNESOTA: Robbinsdale (W9XAE).—Strike out all particulars.

NEW JERSEY: Linden (W2XCY).—Fy., strike out 23,060 (13.01) and above, add 23,100 (12.987), 25,100 (11.95), 27,100 (11.07), 30,100 (9.97), 40,100 (7.48), 50,100 (5.98), 70,100 (4.28), 100,100 (3).

NEW YORK:

Garden City (W2XBW).—Owner, Globe Wireless (Ltd.).

Jones Beach (near) (W2XAN).—Loc., changed to Nassau County, N. Y.

New York (W2XN).—Owner, R. C. A. Victor Co. (Inc.).

New York (W2XW).—Owner, R. C. A. Victor Co. (Inc.).

Woodlawn Heights (W2XAJ).—Owner, R. C. A. Victor Co. (Inc.).

Yonkers (W2XAB).—Owner, R. C. A. Victor Co. (Inc.).

OHIO:

Akron (W8XAS).—Strike out all particulars.

Cleveland (W8XD).—Owner, R. C. A. Radiotron Co. (Inc.).

Cleveland (W8XJ).—Read West Dover, Ohio; fy., strike out 1,688 (177.73), 2,302 (130.32), 3,452 (86.90), 3,492 (85.91), 4,180 (71.77), 4,765 (62.95), 4,785 (62.69), 5,510 (54.44), 6,155 (48.74).

Portable

HAWAII: Kawaihae (K6XB).—Fy., strike out 30,000 (10) to 300,000 (1); add 30,100 (9.97), 35,100 (8.55), 40,100 (7.48), 45,100 (6.65), 50,100 (5.98), 60,100 (4.99), 100,100 (3), 200,100 (1.5), 300,100 (.97).

NEW YORK: New York (W2XCI).—Owner, R. C. A. Victor Co. (Inc.).

UNITED STATES (throughout) (W10XA).—Fy., strike out 4,280 (70.09), 8,560 (35.05), add 1,604 (187.03), 2,398 (125.1), 3,256 (92.5), 4,795 (62.57), 6,425 (46.7), 8,650 (34.68), 12,850 (23.35), 17,300 (17.341).

UNITED STATES (throughout) (W10XB).—Fy., strike out 4,280 (70.09), 8,560 (35.05), add 1,604 (187.03), 2,398 (125.1), 3,256 (92.5), 4,795 (62.57), 6,425 (46.7), 8,650 (34.68), 12,850 (23.35), 17,300 (17.341).

UNITED STATES (throughout) (W10XC).—Fy., strike out 4,280 (70.09), 8,560 (35.05), add 1,604 (187.03), 2,398 (125.1), 3,256 (92.5), 4,795 (62.57), 6,425 (46.7), 8,650 (34.68), 12,850 (23.35), 17,300 (17.341).

UNITED STATES (throughout) (W10XD).—Fy., strike out 4,280 (70.09), 8,560 (35.05), add 1,604 (187.03), 2,398 (125.1), 3,256 (92.5), 4,795 (62.57), 6,425 (46.7), 8,650 (34.68), 12,850 (23.35), 17,300 (17.341).

UNITED STATES (throughout) (W10XE).—Fy., strike out 4,280 (70.09), 8,560 (35.05), add 1,604 (187.03), 2,398 (125.1), 3,256 (92.5), 4,795 (62.57), 6,425 (46.7), 8,650 (34.68), 12,850 (23.35), 17,300 (17.341).

Aircraft

NC-105H (W10XG).—Strike out all particulars.

RELAY BROADCASTING STATION, BY NAME OF STATION

[Alteration and correction to be made to the List of Radio Stations of the United States, edition of June 30, 1929]

OHIO: Harrison (W8XAL).—Loc., changed to Mason, Ohio.

VISUAL BROADCASTING STATION, BY NAME OF STATION

[Alteration and correction to be made to the List of Radio Stations of the United States, edition of June 30, 1929]

ILLINOIS: Chicago (W9XAO).—Owner, Western Television Corporation.

MISCELLANEOUS

LIST OF VESSELS EQUIPPED WITH A RADIOCOMPASS

The following-named vessels are additions to the lists published in Commercial and Government Radio Stations of the United States, edition June 30, 1929, and the International List of Ships Stations published by the Berne Bureau:

Name	Call signal	Owner	Name	Call signal	Owner
COMMERCIAL			COMMERCIAL		
Ann Arbor No. 5...	WDCP	Empire Trust Co.	Edward L. Shea...	KFSE	Tidewater Associ- ated Transport Corporation.
Ann Arbor No. 6...	WDCQ	Ann Arbor Boat Co.			
Axtell J. Byles...	WPBJ	Tidewater Associ- ated Transport Corporation.	Hadnot.....	KOGP	Cities Service Trans- portation Co.
Beaconoil.....	KIVR	National Bank of Commerce in New York.	Halo.....	KDCP	Do.
Beaconstar.....	KDMC	Beacon Oil Co.	John J. Boland...	KDWB	American S. S. Co.
Carplaka.....	KDES	American Seantic Line (Inc.).	Nakhoda.....	WMDE	Fred J. Fisher.
Cities Service Fuel.	WHCP	Cities Service Trans- portation Co.	Nevada.....	WTUO	Texas Co.
Cities Service Ohio.	KDPQ	Do.	Oregon.....	KUJZ	Texas S. S. Co.
City of Flint 32...	WDCI	Pere Marquette Ry. Co.	Redwood.....	WEDS	Pacific American Fisheries Co.
City of New York.	WQDC	American South African Lines.	Samuel Mitchell..	WBDC	Huron Transporta- tion Co.
			Stephen M. Cle- ment.	KFBX	American S. S. Co.
			W. J. Hanna.....	KDKX	Standard Shipping Co.

The radiocompass has been removed from the vessels *Dorothy* (KMIE), *Robert Luckenbach* (KUKS), and *Penobscot* (WXOI).

GULF OF ST. LAWRENCE CANADIAN ICE PATROL

An ice patrol will be maintained in the Gulf of St. Lawrence from:

Cape Ray to Bird Rocks,
Bird Rocks to vicinity of Heath Point,
Heath Point to Cape Ray,

from the opening of navigation in the spring until the route is clear of ice.

The radio call sign VCQP has been allotted for the ice patrol vessel. This is a special call and 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:

- (a) At 8 a. m. and 8 p. m. (E. S. T.) on 600 meters spark (500 kc./s.).
(b) At 8.30 a. m. and 8.30 p. m. (E. S. T.) on 1,621 meters, I. C. W. (185 kc./s.).

The coast radio stations at Chebucto Head (VAV), North Sydney (VCO), and Grindstone (VCN) will be prepared to pass copy of this message to ships requesting it.

In addition the following stations will broadcast a brief summary of the above-mentioned message:

Stations	Time (E. S. T.)	Wave		Remarks
		Meters	Kilo- cycles	
Louisburg (VAS)...	11.00 a. m., 11.00 p. m.....	2,804 C. W..	107	Following weather forecasts.
Cape Race (VCE)...	9.15 a. m., 9.15 p. m.....	600 spark....	500	

Ships requiring the latest information on the Gulf route should communicate directly with the ice patrol vessel VCQP on 600 meters.

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

NOTE.—Vessels requiring information regarding ice conditions in the North Atlantic lane routes should get in touch with the international ice patrol vessel, radio call sign NIDK on 500 kilocycles (600 meters), further details of which are contained in Radio Service Bulletin for January, 1929, page 11.

COMMUNICATION WITH FLYING BOATS OF GREAT BRITAIN

In view of the great assistance which is afforded to flying boats by ships as regards checking their position and course, particularly when out of sight of land, the British authorities have requested masters to instruct radio operators to establish communication whenever possible with any flying boat observed in the vicinity, even during an off-watch period, in order to ascertain whether information of this nature is required. Flying boats desiring to communicate with ships usually call on 500 kc./s. (600 m.), but cases have occurred in which these calls have not been answered, owing to the fact that they were made during one of the off-watch periods of single-operator ships.

The general call signal GEZAA denotes any aircraft of the British Royal Air Force.

STORM WARNINGS BY JAPANESE STATIONS

The Tokio Central Meteorological Observatory station (JGA) transmits storm warnings in plain English language immediately after the weather bulletin on 75 kilocycles (4,000 meters), type A1, at 0,550, 1,100, and 2,350. In cases of urgency it will be transmitted at once on 500 kilocycles (600 meters), type A2, and repeated on the same frequency at the end of the next compulsory silent period.

The Kobe Marine Observatory station (JTJ) transmits similar warnings immediately after the weather bulletin on 100 kilocycles (3,000 meters), type A1, at 0,530, 1,130, and 2,330, whenever a cyclone or a typhoon is likely to appear over Japan or the adjacent seas. The warning will also be transmitted on request on 500 kilocycles (600 meters), type B.

METEOROLOGICAL REPORTS TO AID NAVIGATION TO BE PLACED IN EFFECT BY BRITISH VESSELS BEGINNING MAY 1, 1930

Following the International Conference on Safety of Life at Sea, and in accordance with recommendations of the International Meteorological Conference at Copenhagen in 1929, British selected ships in the Meteorological Office voluntary observing fleet list will make radio meteorological reports for the information of all ships and meteorological services in all parts of the world, as part of an international system.

These reports will be made by certain selected ships fitted for C. W. transmission, addressed to certain meteorological services, and they may be intercepted by all ships.

Other selected ships, fitted for spark transmission only, will broadcast these reports to all ships. They may be intercepted and used as desired by meteorological services.

Reports by type A1 (CW) selected ships will be made to specified radio stations addressed to weather offices and will use the frequency allotted to those stations. In parts of the world where stations are not detailed to receive these reports these ships will make their reports on a frequency of 143 kc./s. (wave length 2,100 meters) to C. Q.

Reports by A2 (ICW) and B (spark) selected ships will be made on a frequency of 500 kc./s. (wave length 600 meters) addressed C. Q.

Schedule

(All times are G. M. T.)

Zones between Greenwich meridians	First weather report			Second weather report		
	Times of observations	Times of reporting by type A1 (CW) ships	Times of broadcasting by type A2 (ICW) and type B (spark) ships	Times of observations	Times of reporting by type A1 (CW) ships	Times of broadcasting by type A2 (ICW) and type B (spark) ships
30° W.-30° E.....	0600	{ 0618 0818 }	0830	1200	1218	1230
30° E.-80° E.....	0600	{ 0618 0818 }	{ 0630 0830 }	1200	{ 1218 0618 0818 }	1230
80° E.-160° E.....	0000	0018	0030	0600	1818	0830
160° E.-140° W.....	0000	0018	0030	1800	2018 1818	1830 2030
140° W.-70° W.....	0000	0018	0030	1800	2018 1818	2030 2030
70° W.-30° W.....	1200	1218	1230	1800	2018	2030

These weather reports will be made in the international ships wireless weather telegraphy code, a figure code which was adopted by the International Meteorological Conference at Copenhagen in 1929, and information of ice, derelicts, and set and drift of current being added in plain language where necessary.

CHANGES IN OPERATING PERIODS OF RADIOBEACONS ON THE GREAT LAKES

The schedule of daily operating periods of all United States radiobeacons on the Great Lakes is to be changed at or near the opening of navigation, 1930, so that each radiobeacon will operate during the last 15 minutes of each hour of the day regardless of weather conditions. In the case of radiobeacons in Lake Michigan and in the western portion of the Straits of Mackinac this change to hourly operation will be made effective on May 1, 1930. In the case of certain radiobeacon stations on Lake Erie, Lake Huron, and Lake Superior, this change will be made effective at the opening of navigation, while in the case of more remote stations in these waters, such as Huron Island, Rock of Ages, Manitou Island, Michigan Island, Devils Island, etc., the change will be made effective at the earliest possible date thereafter, possibly four to six weeks. Pending the change at any station the radiobeacon will continue to operate on daily schedules as in effect the past season and as shown on radiobeacon chart for the Great Lakes for the year 1929.

A new radiobeacon chart of the Great Lakes will be published at an early date and distributed directly to masters of all vessels which have the radio compass.

CHANGE IN RADIO TIME SIGNAL CODE BY UNITED STATES NAVAL STATIONS

The new code for sending United States naval radio time signals, which begin at 5 minutes before the hour, was placed in effect March 8, at the United States Naval Observatory, at Annapolis, at Arlington, and at Pearl Harbor. All other stations will adopt the new code as soon as alterations of the transmitting devices are completed.

The signal consists of the transmission of a dot (.) for every second, omitting the twenty-ninth, fifty-first, fifty-sixth, fifty-seventh, fifty-eighth, and fifty-ninth seconds during the first minute; in the second minute the twenty-ninth, fifty-second, fifty-sixth, fifty-seventh, fifty-eighth, and fifty-ninth seconds will be omitted; in the third minute the twenty-ninth, fifty-third, fifty-seventh, fifty-eighth, and fifty-ninth seconds will be omitted; in the fourth minute the twenty-ninth, fifty-fourth, fifty-sixth, fifty-seventh, fifty-eighth, and fifty-ninth seconds will be omitted; in the fifth minute the twenty-ninth, fifty-first, fifty-second, fifty-third, fifty-fourth, fifty-fifth, fifty-sixth, fifty-seventh, fifty-eighth, and fifty-ninth seconds will be omitted; at the sixtieth second a one-second dash (—) will be sent, the beginning of which is the time signal.

List of amateur radio stations of Holland, Denmark, Hungary, and Switzerland

HOLLAND

Call signal	Owner	Location and address
PAoAF	K. Beintema	Petrus Hendrikszstraat 19a, Groningen.
PAoAS	G. H. L. v. Scherpenzeel	Harddraverstraat 25a, Rotterdam.
PAoBG	A. J. van Gilse	Obrechtstraat 212, 's Gravenhage.
PAoBP	P. L. H. Beek	Gasfuisstraat 14, Venlo.
PAoBZ	F. Brouwer	Beeklaan 216, 's Gravenhage.
PAoCA	W. H. Moorrees	Stooplaan 38, Dordrecht.
PAoCK	J. G. Spiering	Malakkastraat 16, 's Gravenhage.
PAoDA	A. N. Dekker	Stoomweg, van Ewijeksluis.
PAoDM	J. A. Hogesteeger	van Oosterzeestraat 81b, Rotterdam.
PAoDW	B. J. C. Pothast	Eemnesserweg 23, Laren (N. H.).
PAoEO	R. J. McIntyre	Van der Poelstraat 46, Rotterdam.
PAoFB	J. Adama	Noorderstationstraat 47, Groningen.
PAoFF	J. J. Frederikse	St. Appastraat 29, Nijmegen.
PAoFR	F. G. R. J. Baron Sloet tot Everlo	Ermmastraat 49, Hilversum.
PAoGA	Th. C. van Braak	Varsseveld (Gld) C 245a, (Gemeente Wisch),
PAoGG	B. G. van Gemert	Oostmaasstraat 106a, Rotterdam.
PAoHP	S. Wilson	Hilvertsweg 117, Hilversum.
PAoIB	F. Huyser	von Guerichestraat 76, Amsterdam.
PAoJD	J. Diesbergen	Quellynstraat 31, Amsterdam.
PAoJR	J. G. J. Ros	Spoorstraat 28, Hilversum.
PAoKS	E. Vormfelde	Maaskade 108, Rotterdam.
PAoLY	W. B. M. Blommaart	Wilhelmijnstraat A 326, St. Jansteen.
PAoMLR	L. Lindeman	Maretakstraat 25, 's Gravenhage.
PAoML	M. Leeuwijn	Azaleestraat 18, Eindhoven.
PAoNWK	J. v. d. Wijk	le Braamstraat 35, 's Gravenhage.
PAoPG	F. Dubal	Bronckhorststraat 111, Amsterdam.
PAoPT	J. Ph. Tulleners	v. d. Wateringelaan 105, Voorburg.
PAoQQ	C. A. Gehrels	Nicolaas Beetsstraat 29, Eindhoven.
PAoRZ	C. Jobse	Stokroosstraat 5b, Rotterdam.
PAoSV	A. O. L. Strijkers	Vliegveld Waalhaven, Rotterdam.
PAoTW	Th. J. Wilmink	Oosterhaven ZZ 4a, Groningen.
PAoVA	H. Th. van Aalst	Kostschoollaan A 284, Zevenaar.
PAoWIM	W. H. Nowee	Eschdoornstraat 77, 's Gravenhage.
PAoWX	A. E. Karsen	Mathenesserweg 121, Rotterdam.
PAoXG	P. L. Kreyer	Begoniastraat 123, 's Gravenhage.
PAoXH	J. Hagenaar	Eindenhoutstraat 11, Haarlem.
PAoYY	H. Pomes	Simonsstraat 94, Delft.
PAoZK	W. Keeman	Caan Van Necklaan 227, Rijswijk (Z. H.).
PAoZO	J. S. Kantors	Schiedamschevest 12, Rotterdam.

DENMARK

OZ1D	Flensburg, Fr. J. A.	Vesterbro Karhave, Ringsted.
OZ1F	Bramsløv, G. E. R.	Willemoesgade 14, Kobenhavn.
OZ1H	Johannessen, C. S.	Jernbanestationen, Langskov.
OZ1I	Graff, Sv. Aa.	Jernbanestationen, Holsted St.
OZ1J	Jensen, Viggo	Afholdshotellet, Hadsten.
OZ1K	Hansen, H. Aa.	Nygade 21, Ringkobing.
OZ1W	Wormer, L. P. G.	Vestergade 24, Svendborg.
OZ1Y	"Elektromekano" A/S.	Aarhugsgade 88, Kobenhavn.
OZ2A	Schillerup, C. Chr.	Hoskiersvej 31, Nakskov.
OZ2C	Clausen, H.	Danmarksgade, Marstal.
OZ2H	Berthelsen, H.	Danmarksgade, Ulfborg St.
OZ2J	Petersen, H. F.	Danmarksgade, Gramby.
OZ2Q	Steffensen, James	Ehlersvej 8, Hellerup.
OZ2S	Semberg, Eh.	Maribovej 30, Nakskov.
OZ2Z	Winstedt, O. M.	Strandvej 149 i, Charlottenlund.
OZ3A	Randstrup, H. Chr.	Hoyensgade 22, Kobenhavn, O
OZ3C	Jarle, H. J.	Tvargade 14, Aarhus.
OZ3H	Hansen, H.	Vestergade 24, Svendborg.
OZ5M	Jensen, H. E.	Vestergade 24, Hadsten St.
OZ5SK	Kaaber, Svend	Algade 57, Ringe.
OZ7AC	Christensen, A.	Bille, Brahesvej 2, Kobenhavn.
OZ7EH	Hansen, E.	Bille, Brahesvej 2, Aarup.
OZ7HW	Wiberg, H. A. O.	Vesterbrogade 125, Kobenhavn.
OZ7IM	Prior, J. Kornerup	Ehlersvej 7, Hellerup.
OZ7JO	Finsen, Jon	Thorshavn, Faroerne.
OZ7KG	Groot, K. S.	Mariendalsvej 35, Kobenhavn.
OZ7KH	Hansen, K. M.	Mariendalsvej 35, Aarup.
OZ7L	Larsen, L. E.	Sdr. Stationsvej 32, Slagelse.
OZ7LK	Kyster, J. L.	Chr. Winthersvej 20, Aabyhøj.
OZ7NG	Neiborg, H. J.	Chr. Winthersvej 20, Eiby St.
OZ7P	Pedersen, P. C. V.	Perlestikkergade 4, Nakskov.
OZ7PJ	Jorgensen, P. V.	Ingeniorkasernen, Kobenhavn.
OZ7RL	"Radiolytteren"	Roadhuspladsen 55, Kobenhavn.
OZ7T	Hasselbalch, S. M.	Borupgaard, Snekkersten.
OZ7TJ	Jensen, Th.	O. Farimagsgade 57, Kobenhavn.
OZ7WH	Hamerik, M. W.	Gustav Adolphsgade 5, Kobenhavn.
OZ7Y	Stannow, J.	Boibrovej 40, Rungsted.

List of amateur radio stations of Holland, Denmark, Hungary, and Switzerland—
Continued

HUNGARY

Call signal	Owner	Location and address
HA F4A	Baratosi Bibo Denes	Budapest.
HA F1A	Nekolny Kurt	Do.
HA F2A	Kemeny Istvan	Do.
HA F6A	Horvath Laszlo	Do.
HA F3A	Vitez Hollos Lajos	Nagykanizsa.
HA F7A	Baro Neu Sandor	Szombathely.
HA F5A	Ancenberger Mihaly	Kispest.
HA F8A	Mayer Ferenc	Gybr.
HA F1B	Briski Jozsef	Kispest.
HA F2B	Pataki Karoly	Budapest.
HA F3B	Perenyi Sandor	Abony.
HA F4B	Phillips radio r. t.	Budapest.
HA F5B	Jovitz G Gyorgy	Do.
HA F6B	Pamlenyi Pal	Do.
HA F7B	Vamos Sandor	Szentgotthard.
HA F8B	Szandovics Jozsef	Rakosszentimihaly.
HA F1C	Kraicz Karoly	Tiszafured.
HA F2C	Balla Laszlo	Budapest.
HA F3C	Holly Imre	Nagycenk.
HA F4C	Krebs Erno	Budapest.
HA F7C	Tokes Imre	Karcag.
HA F8C	Kiss Lajos	Budapest.

SWITZERLAND

HB9B	Radio Club	Bale.
HB9C	Max Wuest, Ing.	Tilleuls 6, Lausanne.
HB9D	Radio Club	Zurich.
HB9E	Groner Josef	Hallwylstr. 40, Zurich.
HB9F	Madeleine Moret	Av. Eglantine 6, Lausanne.
HB9G	Schneeberger W.	Square des Fleurettes 20, Lausanne.
HB9H	J. Schadler	Frobelstrasse, Wil St. Gall.

List of Mexican experimental stations

Call	Owner	Location
X1A	Juan Moral	Atzacotalco, D. F.
X1AA	Julio Pajeto	Tacubava, D. F.
X1AF	Jose Rios	Mexico, D. F.
X1AX	Francisco Castro Jerrera	Do.
X1C	Marcos Veramendi	Do.
X1E	Arturo Martinez	Do.
X1F	Teniente Coronel Fernando Proal	Do.
X1J	Guadalupe Cardenas	Do.
X1K	Juan Cross Buchanan	Do.
X1L	Alejandro Leon, Jr.	Do.
X1N	Ing. Manuel Medina	Do.
X1O	Manuel Zetina	Do.
X1W	Fernando Sanchez A.	Do.
X1X	Francisco Morales A.	Do.
X5A	Andres de Matienzo	Puebla, Pue.
X9A	Ing. Carlos G. de Cosio	Queretaro, Qro.
X9B	Salvador Sanchez	Do.
X23A	Antonio de la Pena	Saltillo, Coah.
X27B	Eduardo Martinez Canton	Merida, Yuc.
X29A	Saturnino Campoy	Hermosillo, Son.

AIRPLANE DIRECTION FINDERS

One of the lines of aeronautic radio research work carried on by the Bureau of Standards is the development of a direction finder for use aboard airplanes. Such a device is inherently more difficult for the pilot to operate than the radio-range beacon aids. It, however, offers a means of navigation for the itinerant airplane or for any aircraft regardless of whether it follows one of the established airways. It thus supplements the department's radio-range beacon system. A direction finder of the rotating-coil type is being developed, of maximum simplicity in

use, usable either as a homing device or for bearing indications. A model has been constructed and is now under laboratory test which is expected to fulfill these requirements. Flight tests on this direction finder will begin as soon as it is thoroughly tested in the laboratory.

This direction finder employs two small crossed loop antennas rotating as a unit. An antenna tuning system has been devised permitting a uni-tuning control and proper combinations of the two antenna currents without mechanical switching in the radio-frequency circuits. It operates on the comparison of two signals rather than on zero signal. Hence it permits of specially advantageous operation under conditions of atmospheric or external interference, and when used as a homing device gives a positive indication of the direction of deviation from the course. It also offers an adjustment whereby the course indications may be made as sharp as is desired.

Course indications may be either aural or visual. The aural indications may consist of the comparison of the intensities of two signals, or these signals may be interlocked giving the same course indications as in the aural radio-range beacon system. Visual indication may be obtained by the use of a zero-center deflection instrument. With either type of course indication, bearings may be obtained from any transmitting station within the frequency range of the device. Means are also being worked out whereby a vibrating-reed indicator gives the indications, thereby taking advantage of the freedom from interference inherent in this type of indication.

The research work on this development is actively in progress, and is expected to include flight tests of various types of direction finders.

TESTS OF AIRPLANE ANTENNAS

The Bureau of Standards is conducting a research on receiving antennas for airplane use. As a result of preliminary work done in 1928 the vertical pole antenna was developed, and there is still every indication that it is the preferable type of antenna for reception on airplanes. Some difficulties have occurred in its use, however, which justify renewed study of the antenna problem directed both to removing these difficulties and to a more careful study of the possibilities of the several available types of antennas. The accumulation of ice on the vertical pole antenna encountered under certain weather conditions is a serious problem. In some cases this ice accumulation cuts down the signal markedly and also sets up vibrations which may be so severe as to break off the antenna or to endanger the airplane. A number of expedients are in view to eliminate these difficulties.

Some tests have been begun of the various possible types of fixed antennas. In addition to the vertical pole, these include a short longitudinal inclined antenna, the longitudinal horizontal antenna, transverse L antenna, transverse T antenna, a transverse horizontal di-pole antenna, a wing-tipped T antenna, and combinations of these. These are being studied for their sensitivity, directional errors, and localizing effect (when over the beacon tower). The longitudinal inclined antenna, transverse T antenna, and wing-tipped T antenna give localizing effects which may be quite as useful as that obtained with the vertical pole antenna; these types, however, introduce errors in course indication which are due to the inclination of the antenna with respect to the course when the orientation of the airplane is shifted, and may be very large when within 5 or 10 miles of the beacon station. These preliminary results will be extended and more complete data obtained on the several types of antennas.

RADIO ECHO SIGNAL RESEARCH

A major purpose in the study of radio-wave phenomena carried on by the Bureau of Standards is to understand more completely what happens to the radio waves between the transmitting and the receiving stations. It is well known that part of the radiation from the transmitting station reaches the upper atmosphere, from which it may be refracted back to earth. It is this refraction that makes possible long-distance communication.

In order to determine some of the properties of the upper atmosphere which are responsible for this phenomenon, the bureau and a number of other laboratories are cooperating in a study of echo signals. The procedure in this study is to record, by means of an oscillograph, the received signals from a powerful transmitter which is sending out pulses of extremely short duration. The oscillograph record shows for each pulse sent out a sharp peak for the wave coming along the surface of the earth, followed at a measurable time later by

one or more peaks representing "echoes" from the upper atmosphere. By measuring on the oscillogram the interval of time between the reception of the ground wave and the sky wave, it is possible by simple calculation to determine the apparent height in the atmosphere which the wave reached. In this method of calculation it is assumed that reflection takes place from an ionized layer in the upper atmosphere. Actual reflection as from a mirror does not take place, but a gradual bending or refraction occurs, due to an increase of ionization with height so that the actual height reached by the wave is somewhat less than that given by the calculation.

At present pulse signals are being sent at regular intervals from station NKF of the Naval Research Laboratory at Bellevue, D. C., and are being received and oscillographed at the Bureau of Standards field station near Kensington, Md. Records obtained since the first of the year show that on 4,045 kilocycles the sky wave arrives at the receiving station on the average 0.00143 second later than the ground wave, at 11.30 a. m. on normal days, while the retardation for the same frequency at 4 p. m. averages 0.00150 second. These retardations correspond to 225 kilometers and 235 kilometers, respectively, as the apparent height of the ionized layer.

With the frequency of 8,650 kilocycles, the average retardation is 0.00184 second at 11.30 a. m. and 0.00186 second at 4 p. m., corresponding to apparent heights of 287 kilometers and 290 kilometers, respectively. The greater retardations for the higher frequencies may be attributed to dispersion. As with light waves, the index of refraction is thus shown to increase with frequency.

The retardations are shown to increase after sunset to values as high as 0.003 second for 4,045 kilocycles. At sunrise they return abruptly to normal daytime values. Records obtained at 4 p. m. on March 13, 1930, during a magnetic storm, show retardations of 0.00162 second for 4,045 kilocycles and 0.00285 second for 8,650 kilocycles, as compared with the normal values of 0.00150 second and 0.00186 second, respectively.

It is planned to extend the study to other frequencies, in order to understand more completely the distribution of ionization, and to continue the observations over a considerable period of time so that seasonal variations may be studied.

NEW PUBLICATIONS BY THE BUREAU OF STANDARDS

The March issue of the Bureau of Standards Journal of Research contains six papers of radio interest. These will be available separately in reprint form later. The prices of the reprints had not been fixed at the time this announcement went to press.

- Design of a Portable Temperature-Controlled Piezo Oscillator, V. E. Heaton and W. H. Brattain, pp. 345-350. Research Paper No. 153.
- A 12-Course Radio Range for Guiding Aircraft with Tuned Reed Visual Indication, H. Diamond and F. G. Kear, pp. 351-369. Research Paper No. 154.
- Applying the Radio Range to the Airways, F. G. Kear and W. E. Jackson, pp. 371-381. Research Paper No. 155.
- New Piezo Oscillations with Quartz Cylinders Cut Along the Optical Axis, August Hund and R. B. Wright, pp. 383-394. Research Paper No. 156.
- Engine-Ignition Shielding for Radio Reception in Aircraft, H. Diamond and F. G. Gardner, pp. 415-424. Research Paper No. 158.
- Development of the Visual Type Radiobeacon System, J. H. Dellinger, H. Diamond, and F. W. Dunmore, pp. 425-459. Research Paper No. 159.

INDEX TO GENERAL ORDERS OF THE FEDERAL RADIO COMMISSION AS PUBLISHED IN THE RADIO SERVICE BULLETIN

ALASKA:

For station license extension orders, see index under Licenses.

Regulations governing issuance of construction permits, licenses, etc., G. O. 79, December 20, 1929. (R. S. B. 153, December, 1929.)

AMATEURS:

Definition of, G. O. 24, March 7, 1928. (R. S. B. 132, March, 1928.)

Definition of, additional frequency band opened, telephone bands specified, G. O. 76, November 6, 1929. (R. S. B. 152, November, 1929.)

CALL LETTERS: To be announced at least every 15 minutes, G. O. 8, May 5, 1927. (R. S. B. 122, May, 1927.)

CANDIDATES FOR PUBLIC OFFICE: Use of broadcasting stations by, G. O. 81, May 11, 1928. (R. S. B. 134, May, 1928.)

CHAIN PROGRAMS:

Allowed for only one hour unless stations are 300 miles apart, G. O. 43, September 8, 1928. (R. S. B. 138, September, 1928.)

Postponement of G. O. 43, G. O. 46, October 5, 1928. (R. S. B. 139, October, 1928.)

Postponement of G. O. 43, G. O. 57, January 18, 1929. (R. S. B. 142, January, 1929.)

Postponement of G. O. 43, G. O. 59, February 16, 1929. (R. S. B. 143, February, 1929.)

Postponement of G. O. 43, G. O. 63, May 15, 1929. (R. S. B. 146, May, 1929.)

Postponement of G. O. 43, G. O. 71, September 18, 1929. (R. S. B. 150, September, 1929.)

G. O. 43 and 46 limiting programs to certain station repealed, G. O. 81, December 20, 1929. (R. S. B. 153, December, 1929.)

- CONSTRUCTION PERMITS:** Regulations governing hearings on application for construction permits, G. O. 37, August 22, 1928. (R. S. B. 137, August, 1928.)
- CONTROL APPARATUS:** Installation of automatic frequency control apparatus must be authorized by the Federal Radio Commission, G. O. 77, November 8, 1929. (R. S. B. 152, November, 1929.)
- DAMPED WAVES:**
Discontinuance of by other than ships after January 1, 1929, G. O. 51, October 31, 1928. (R. S. B. 140, November, 1928.)
Regulations governing the sharpness of emissions by ships using damped waves, G. O. 70, September 13, 1929. (R. S. B. 150, September, 1929.)
Use of restricted, G. O. 82, January 3, 1930. (R. S. B. 153, December, 1929.)
- DAYLIGHT SAVING TIME:** Regulations governing the hours of operation of daylight saving time, G. O. 61, March 23, 1929. (R. S. B. 144, March, 1929.)
- DEFINITIONS:**
Of an amateur station, G. O. 24, March 7, 1928. (R. S. B. 132, March, 1928.)
Of a daytime broadcasting station, G. O. 41, September 4, 1928. (R. S. B. 139, September, 1928.)
Of a limited time broadcasting station, G. O. 48, October 22, 1928. (R. S. B. 139, September, 1928.)
Relay broadcasting, telephone and visual broadcasting channels defined, G. O. 62, April 5, 1929. (R. S. B. 145, April, 1929.)
- DISTRESS SIGNALS:** Rules and regulations requiring broadcast stations to give absolute priority to distress communications or signals, G. O. 66, June 10, 1929. (R. S. B. 147, June, 1929.)
- EXPERIMENTAL STATIONS:** Regulations governing issuance of relay broadcasting, visual broadcasting, general experimental and aircraft experimental station licenses, G. O. 64, May 20, 1929. (R. S. B. 147, June, 1929.)
- FREQUENCIES:**
Broadcast frequency band not to be extended; 1,500-2,000 kilocycles should be held open for experiments in broadcasting and visual broadcasting, G. O. 4, April 5, 1927. (R. S. B. 121, April, 1927.)
One-half kilocycle deviation allowed, announcement of frequency by authority of Federal Radio Commission, G. O. 7, April 28, 1927-R. (R. S. B. 121, April, 1927.)
Allocation of channels in the broadcast band to the different zones, a separation of 10 kilocycles to be mentioned, G. O. 40, August 30, 1928. (R. S. B. 137, August, 1928.)
Broadcasting stations permitted to make tests in changing frequency under allocations effective November 11, 1928, G. O. 45, September 24, 1928. (R. S. B. 138, September 1928.)
Allocation of between 1,500 and 6,000 kilocycles, G. O. 55, December 22, 1928. (R. S. B. 141, December, 1928.)
Picture and television transmissions restricted in use of frequencies in the broadcast band, G. O. 56, January 14, 1929. (R. S. B. 142, January, 1929.)
Relay broadcasting frequencies, February 18, 1929. (R. S. B. 144, March, 1929.)
Visual, telephone, and relay broadcasting channels defined, G. O. 62, April 5, 1929. (R. S. B. 145, April, 1929.)
Allocation of frequencies between 1,500 and 6,000 kilocycles, G. O. 55 amended, G. O. 74, October 11, 1929. (R. S. B. 151, October, 1929.)
Additional amateur frequency band opened and telephone bands specified, G. O. 76, November 6, 1929. (R. S. B. 152, November, 1929.)
- HEARINGS:**
Rules before Federal Radio Commission, G. O. 12, May 27, 1927. (R. S. B. 122, May, 1927.)
Testimony, G. O. 14, June 3, 1927. (R. S. B. 123, June, 1927.)
On reducing interference in broadcast band, G. O. 2. (R. S. B. 132, March, 1928.)
Designating bands to be cleared of heterodynes; procedure for clearing heterodyning channels, G. O. 19, November 14, 1927. (R. S. B. 132, March, 1928.)
On applications for transoceanic station licensee, G. O. 29, May 9, 1928. (R. S. B. 133, April 1928.)
Hearings for certain broadcast stations which have not satisfied the Federal Radio Commission, list of 162 stations, G. O. 32, May 25, 1928. (R. S. B. 134, May, 1928.)
Regulations governing hearings on application for construction permit, renewal of licenses, etc., G. O. 37, August 22, 1928. (R. S. B. 137, August, 1928.)
- HOURS OF OPERATION:** Regulations governing the hours of operation of broadcasting stations affected by daylight saving time, G. O. 6, March 23, 1929. (R. S. B. 144, March, 1929.)
- INTERFERENCE:**
Broadcasting stations may file affidavits certifying interference is being caused to its signals, G. O. 15, June 7, 1927. (R. S. B. 123, June, 1927.)
Hearings on reducing in broadcast band, G. O. 2. (R. S. B. 132, March, 1928.)
Designating bands to be cleared of heterodynes, procedure for clearing heterodyning channels, G. O. 22, January 16, 1928. (R. S. B. 132, March, 1928.)
Broadcasting stations restricted as to power used after sunset; operation during daytime not to cause greater heterodyning than exists during evening, G. O. 10 repealed, G. O. 53, November 26, 1928. (R. S. B. 140, November, 1928.)
Picture and television transmissions restricted in use of frequencies in the broadcast band, G. O. 56, January 14, 1929. (R. S. B. 142, January, 1928.)
- LICENSES:**
Extension of amateur and ship station licenses issued by the Department of Commerce until further orders, G. O. 1, March 15, 1927. (R. S. B. 120, March, 1927.)
Extension of coastal point-to-point, technical and training, and experimental licenses in force on February 22, 1927, until further orders, G. O. 3, March, 1927. (R. S. B. 120, March, 1927.)
Extension of broadcast licenses issued under Department of Commerce ended; permit must be obtained, G. O. 5, April 5, 1927. (R. S. B. 121, April, 1927.)
Permits for broadcasting stations discontinued; licenses to be issued for 60 days, G. O. 11, May 21, 1927. (R. S. B. 122, May, 1927.)
Permits extended to June 15, 1927, G. O. 11, amended, G. O. 13, May 28, 1927. (R. S. B. 122, May 1927.)
Extension of broadcasting licenses, G. O. 21, December 1, 1927. (R. S. B. 129, December, 1927.)
Extension of broadcasting licenses, G. O. 23, February 20, 1928. (R. S. B. 131, February, 1928.)
Extension of broadcasting licenses, G. O. 25, March 27, 1928. (R. S. B. 132, March, 1928.)
Land, technical and training, experimental, ship, and amateur licenses extended under G. O. 1 and 3 terminated, G. O. 26, March 27, 1928. (R. S. B. 132, March, 1928.)
Extension of broadcasting licenses, G. O. 18, October 12, 1927. (R. S. B. 132, March, 1928.)
Extension of broadcasting licenses, G. O. 22, January 16, 1928. (R. S. B. 132, March, 1928.)
Extension of broadcasting licenses, G. O. 27, April 20, 1928. (R. S. B. 133, April, 1928.)
Extension of certain broadcasting licenses (162) until hearings are held on application for renewals, G. O. 32, May 25, 1928. (R. S. B. 134, May, 1928.)
Extension of broadcasting licenses, G. O. 33, May 25, 1928. (R. S. B. 134, May, 1928.)
Extension of portable broadcasting licenses, G. O. 34, May 25, 1928. (R. S. B. 134, May, 1928.)

LICENSES—Continued.

- Extension of broadcasting licenses not subject to G. O. 32, G. O. 35, July 25, 1928. (R. S. B. 136, July, 1928.)
- Extension of broadcasting licenses subject to G. O. 33, G. O. 36, July 26, 1928. (R. S. B. 136, July, 1928.)
- Regulations governing hearings on application for construction permit, renewal of licenses, etc., G. O. 37, August 22, 1928. (R. S. B. 137, August, 1928.)
- Extension of broadcasting licenses not subject to G. O. 32, G. O. 38, August 22, 1928. (R. S. B. 137, August, 1928.)
- Extension of coastal, point-to-point, technical and training, experimental, ship, and amateur licenses previously extended by G. O. 1, 3, and 26, G. O. 39, August 22, 1928. (R. S. B. 137, August, 1928.)
- Extension of broadcasting licenses until November 11, 1928, except those affected by G. O. 32, G. O. 44, September 8, 1928. (R. S. B. 138, September, 1928.)
- Extension of coastal, point-to-point, technical and training, experimental, and ship licenses until December 31, 1928, G. O. 47, October 23, 1928. (R. S. B. 139, October, 1928.)
- Extension of coastal, point-to-point, experimental, and ship licenses until January 31, 1929, G. O. 54, December 22, 1928. (R. S. B. 141, December, 1928.)
- Extension of coastal, point-to-point, experimental, and ship licenses until March 16, 1929, G. O. 58, January 28, 1929. (R. S. B. 142, January, 1929.)
- Extension of coastal, point-to-point, and experimental licenses until June 1, 1929, G. O. 60, March 9, 1929. (R. S. B. 144, March, 1929.)
- Extension of broadcasting licenses until October 31, 1929, and other classes of station licenses and construction permits until October 1, 1929, G. O. 69, June 20, 1929. (R. S. B. 147, June, 1929.)
- Alaska station licenses extended, G. O. 72, September 29, 1929. (R. S. B. 150, September, 1929.)
- Alaskan station licenses extended, G. O. 73, October 10, 1929. (R. S. B. 151, October, 1929.)
- Alaskan station licenses extended until January 25, 1931, G. O. 83, January 25, 1930. (R. S. B. 154, January, 1930.)

MECHANICAL REPRODUCTIONS:

- Nature of, must be announced, G. O. 16, August 9, 1927. (R. S. B. 125, August, 1928.)
- Character must be announced, G. O. 49, October 26, 1928. (R. S. B. 139, October 1928.)
- Character ordered to be announced, G. O. 49 modified, G. O. 52, November 26, 1928. (R. S. B. 139, October 1928.)
- Character ordered to be announced, G. O. 78, December 5, 1929. (R. S. B. 153, December, 1929.)

OPERATORS: Operators of certain stations required to keep continuous watch at certain stations operating between 550 and 1,000 kilocycles, G. O. 66, June 10, 1929. (R. S. B. 147, June, 1929.)

PORTABLE STATIONS:

- Licenses only issued broadcasting stations for 120 days, 100 watts, 1,470-1,490 kilocycles, G. O. 6, April 26, 1927. (R. S. B. 121, April, 1927.)
- Broadcasting stations no longer licensed, G. O. 30, May 10, 1928. (R. S. B. 134, May, 1928.)
- Extension of portable broadcasting station licenses, G. O. 34, May 25, 1928. (R. S. B. 134, May, 1928.)

POWER:

- Applications for increase between 6 a. m. and 6 p. m. for educational, religious, civic, and market news stations, G. O. 10, May 18, 1927. (R. S. B. 122, May, 1927.)
- Broadcasting stations not allowed power in excess of 25 kilowatts except for experiments and daytime programs, G. O. 42, September 7, 1928. (R. S. B. 138, September, 1928.)
- Broadcasting stations restricted after sunset, operation during daytime not to cause greater heterodyning than exists during evening, G. O. 10, repealed, G. O. 53, November 26, 1928. (R. S. B. 140, November, 1928.)

RECORDS—MECHANICAL REPRODUCTIONS:

- Nature of, must be announced, G. O. 16, August 9, 1927. (R. S. B. 125, August, 1927.)
- Character must be announced, G. O. 49, October 26, 1928. (R. S. B. 139, October, 1928.)
- Character ordered to be announced, G. O. 49 modified, G. O. 52, November 26, 1928. (R. S. B. 139, October, 1928.)
- Character ordered to be announced, G. O. 78, December 5, 1929. (R. S. B. 152, December, 1929.)

RELAY BROADCASTING:

- Rules and regulations governing, February 18, 1929. (R. S. B. 144, March, 1929.)
- Defined, G. O. 62, April 5, 1929. (R. S. B. 145, April, 1929.)
- Rules and regulations governing issuance of construction permits and licenses for relay broadcasting stations, G. O. 68, June 10, 1929. (R. S. B. 147, June, 1929.)

SALE OF STATIONS: Not to be sold without consent of Federal Radio Commission, G. O. 9, May 13, 1927. (R. S. B. 122, May, 1927.)

STUDIOS: Permission to move required, G. O. 28, April 20, 1928. (R. S. B. 133, April, 1928.)

SUBGENAS: Regulations governing issuance, G. O. 67, June 10, 1929. (R. S. B. 147, June, 1929.)

TELEPHONE: Channels defined, G. O. 62, April 5, 1929. (R. S. B. 145, April, 1929.)

TESTS: Broadcasting stations permitted to make tests in changing frequency under allocations effective November 11, 1928, G. O. 45, September 24, 1928. (R. S. B. 138, September, 1928.)

TRANSOCEANIC: Hearings on applications for station licenses, G. O. 29, May 9, 1928. (R. S. B. 134, May, 1928.)

TRAVEL: Authorization for members and employees of Federal Radio Commission to travel for purpose of holding and assisting at hearings and investigations, G. O. 65, May 27, 1929. (R. S. B. 147, June, 1929.)

VIOLATIONS: Procedure to be followed in reply to notifications of violations of radio laws, regulations and orders, G. O. 75, October 30, 1929. (R. S. B. 152, November, 1929.)

VISUAL BROADCASTING:

Regulations governing picture and television transmission, G. O. 50, October 31, 1928. (R. S. B. 140, November, 1928.)

Picture and television transmission restricted in use of frequencies in the broadcast band, G. O. 56, January 14, 1929. (R. S. B. 142, January, 1929.)

Rules and regulations governing, February 18, 1929. (R. S. B. 144, March, 1929.)

Defined, G. O. 62, April 5, 1929. (R. S. B. 145, April, 1929.)