

# RADIO SERVICE BULLETIN

ISSUED MONTHLY

Washington, February 28, 1931—No. 167

## CONTENTS

	Page		Page
New stations.....	2	Stations in Persian Gulf closed.....	27
Alterations and corrections.....	8	Number and class of radio stations of the world, 1913 to 1930.....	28
Miscellaneous:		A radio method of synchronizing recording apparatus.....	29
Changes in the list of vessels equipped with a radio compass.....	23	Accurate frequency transmissions on 5,000 kilocycles.....	29
General orders of the Federal Radio Commission.....	23		
Broadcasting station frequency measurements during December, 1930.....	26		

## 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 Type = Call signal (letters) assigned.  
 = 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.  
 Power = Height of antenna (meters) and intensity of current at its base (meters-amperes).  
 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, A=aircraft.  
 Hours Accts. = Hours of operation: N=continuous service, X=no regular hour, Y=sunrise to sunset.  
 = Message accounts settled by.  
 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, 1939, 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	Licensee
Atlanta, Ga. <sup>1</sup>	FX	WRDD	4,945 (60.66)	P	X	Press Wireless (Inc.).
Botocan, P. I. (Laguna) <sup>1</sup>	FX	KZFX	2,965 (75.7)	P	X	Manila Electric Co.
Cagayan, P. I. (Misamis) <sup>3</sup>	FX	KUX	5,165 (58.09)	PR		Philippine Insular Government.
Cebu, P. I. (Cebu) <sup>4</sup>	FX	KZFR	4,885 (61.42)	P	X	Macleod & Co.
Cebu, P. I. (Cebu) radiotelephone. <sup>5</sup>		KZGG	2,830 (106), 5,825 (51.5), 8,940 (33.6)		N	Philippine Long Distance Telephone Co.
Cebu, P. I. (Cebu) <sup>1</sup>	FX	KZGK	5,990 (50), 8,930 (33.53)	PR	N	Radio Corporation of the Philippines.
Chicago, Ill. <sup>1</sup>	FX	WRDC	4,735 (63.35), 4,925 (60.91), 4,965 (60.42), 4,995 (60.06), 5,305 (56.55)	P	X	Press Wireless (Inc.).
Cleveland, Ohio <sup>1</sup>	FX	WRDE	4,995 (60.06)	P	X	Do.
Crane, Tex. <sup>1</sup>	FX	KGNA	5,075 (59.11), 5,085 (58.99), 5,780 (51.90), 5,795 (51.76), 5,810 (51.63)	PR	X	Western Radio Telegraph Co.
Dallas, Tex. <sup>1</sup>	FX	KGWB	4,745 (63.22)	P	X	Press Wireless (Inc.).
Davao, P. I. (Davao) <sup>8</sup>	FX	KZFS	4,885 (61.42)	P	X	Macleod & Co.
Davao, P. I. (Davao) <sup>11</sup>	FX	KZGN	5,305 (56.5), 9,470 (31.7)	PR	N	Radio Corporation of the Philippines.
Denver, Colo. <sup>1</sup>	FX	KGWD	4,725 (63.49)	P	X	Press Wireless (Inc.).
Detroit, Mich. <sup>1</sup>	FX	WRDG	4,715 (63.63)	P	X	Do.
Fabrica, P. I. (Occidental Negros) <sup>7</sup>	FX	KZFG	4,705 (63.76)	P	X	Insular Lumber Co.
Hook Bay, P. I. (Tayabas) <sup>3</sup>	FX	KZGB	4,665 (64.31)	P	X	Pacific Lumber & Development Co.
Iloilo, P. I. (Iloilo) <sup>9</sup>	FX	KZFH	4,855 (61.80)	P	X	Visayan Stevedore Transportation Co.
Iloilo, P. I. (Iloilo) radiotelephone. <sup>10</sup>	FX	KZGH	2,760 (108.7), 5,795 (51.8), 9,490 (31.6)		N	Philippine Long Distance Telephone Co.
Iloilo, P. I. (Iloilo) <sup>10</sup>	FX	KZGL	7,415 (40.5)	PR	N	Radio Corporation of the Philippines.
Jal, N. Mex. <sup>10</sup>	FX	KGNC	5,075 (59.11), 5,085 (58.99), 5,780 (51.9), 5,795 (51.76), 5,810 (51.63)	PR	X	Western Radio Telegraph Co.
Kabasalan, P. I. (Zamboanga) <sup>11</sup>	FX	KZFB	4,735 (63.35)	P	X	Goodyear Rubber & Tire Co.
Kansas City, Mo. <sup>1</sup>	FX	KGWC	4,975 (60.30)	P	X	Press Wireless (Inc.).
Lamit, P. I. (Camarines Sur) <sup>12</sup>	FX	KZFX	4,825 (62.18)	P	X	Cadwallader-Gibson Lumber Co.
Laog, P. I. (Ilocos Norte) <sup>13</sup>	FX	KTE	4,765 (62.96)	PR		Philippine Insular Government.
Lawrenceville, N. J. (radiotelephone) <sup>14</sup>	FX	WNB	6,755 (44.41), 10,550 (28.44)	PR	N	American Telephone & Telegraph Co.
Little Neck, N. Y. <sup>1</sup>	FX	WRDK	4,725 (63.49), 4,935 (60.79), 4,985 (60.18), 5,335 (56.23)	P	X	Press Wireless (Inc.).
Los Angeles, Calif. <sup>15</sup>	FX	KGPL	1,712 (175.23)	P	N	City of Los Angeles, police department.
Do. <sup>1</sup>	FX	KGWE	4,945 (60.66), 5,325 (56.33)	P	X	Press Wireless (Inc.).
Manila, P. I. <sup>16</sup>	FX	KAQ	5,930 (50.59)	P	X	Manila R. R. Co.
Do. <sup>17</sup>	FX	KZFF	4,705 (63.76)	P	X	Insular Lumber Co.
Do. <sup>18</sup>	FX	KZFG	4,885 (61.42)	P	X	Macleod & Co.
Do. <sup>19</sup>	FX	KZFY	3,985 (75.3)	P	X	Manila Electric Co.
Manila, P. I. (radiotelephone) <sup>1</sup>		KZGF	2,730 (109.8), 5,765 (52), 9,170 (32.7)		N	Philippine Long Distance Telephone Co.
Manila, P. I. <sup>1</sup>	FX	KZGJ	5,435 (55.2), 5,445 (55), 7,980 (37.59), 9,450 (31.72)	PR	N	Radio Corporation of the Philippines.
Memphis, Tenn. <sup>1</sup>	FX	WRDF	4,955 (60.54)	P	X	Press Wireless (Inc.).
Miami, Fla. <sup>1</sup>	FX	WRDH	4,975 (60.30)	P	X	Do.
Minneapolis, Minn. <sup>1</sup>	FX	KGWF	4,935 (60.79)	P	X	Do.
Naga, P. I. (Camarines Sur) <sup>20</sup>	FX	KZFT	4,735 (63.36)	P	X	Manila R. R. Co.
New Orleans, La. <sup>1</sup>	FX	WRDL	5,295 (56.65)	P	X	Press Wireless (Inc.).
New York, N. Y. (radio telephone) <sup>21</sup>	FC	WOX	1,672 (179.43)	PG	X	New York Telephone Co.
Philadelphia, Pa. <sup>1</sup>	FX	WRDI	4,725 (63.22)	P	X	Press Wireless (Inc.).
Pittsburgh, Pa. <sup>22</sup>	FX	WPDU	1,712 (175.23)	P	N	City of Pittsburgh.
Port Lamon, P. I. (Surigao) <sup>23</sup>	FX	KZFC	4,775 (62.825)	P	X	Port Lamon Lumber Co.

See footnotes at end of table.

Commercial land stations, alphabetically, by names of stations—Continued

[Additions to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1930, 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	Licensee
Salt Lake City, Utah <sup>1</sup>	FX	KGWH	4,925 (60.91)	P	X	Press Wireless (Inc.).
San Francisco, Calif. <sup>1</sup>	FX	KGWA	4,715 (3.3), 5,315 (56.44)	P	X	Do.
Seattle, Wash. <sup>1</sup>	FX	KGWG	4,735 (3.15)	P	X	Do.
Sioux City, Iowa <sup>24</sup>	FX	KGPK	2,470 (121.5)	P	N	City of Sioux City.
Stelton, N. J. <sup>25</sup>	FA	WEEN	3,070 (97.71), 3,076 (97.52), 5,690 (52.72).	P	X	Aeronautical Radio (Inc.).
Tacloban, P. I. (Leyte) <sup>26</sup>	FX	KTC	5,165 (58.09)	PR		Philippine Insular Government.
Tambang, P. I. (Camarines Sur) <sup>27</sup>	FX	KZFW	4,825 (62.18)	P	X	Cadwallader-Gibson Lumber Co.
Upper Newton Falls, Mass. <sup>1</sup>	FX	WRDJ	4,715 (63.63), 5,345 (56.12)	P	X	Press Wireless (Inc.).
Washington, D. C. <sup>1</sup>	FX	WRDB	4,745 (63.22), 4,955 (60.54), 5,285 (56.76), 5,355 (56.02).	P	X	Do.
Wink, Tex. <sup>1</sup>	FX	KGNB	5,075 (59.11), 5,085 (58.99), 5,780 (51.9), 5,795 (51.76), 5,810 (51.63).	PR	X	Western Radio Telegraph Co.
Zamboanga, P. I. (Zamboanga) <sup>1</sup>	FX	KZGM	5,225 (57.4), 8,950 (31.84)	PR	N	Radio Corporation of the Philippines.

<sup>1</sup> Type, A1.

<sup>2</sup> Loc. 121° 29' 30" E., 14° 09' 25" N.; type, A2.

<sup>3</sup> Loc. 124° 38' 11" E., 08° 27' 44" N.; hours, 7 a. m. to 10 p. m.

<sup>4</sup> Loc. 123° 55' 24" E., 10° 19' 23" N.; type, A2.

<sup>5</sup> Type, A3.

<sup>6</sup> Loc. (approximate) 125° 37' 30" E., 07° 06' 00" N.; type A2.

<sup>7</sup> Loc. (approximate) 123° 21' 30" E., 10° 54' 00" N.; type, A2.

<sup>8</sup> Loc. 121° 50' 10" E., 14° 56' 30" N.; type, A2.

<sup>9</sup> Loc. (approximate) 120° 35' 00" E., 10° 42' 00" N.; type, A2.; power, 18/6.

<sup>10</sup> Type, A2.

<sup>11</sup> Loc. (approximate) 122° 48' 00" E., 07° 47' 00" N.; type, A2.

<sup>12</sup> Loc. (approximate) 123° 29' 30" E., 13° 55' 00" N.; type, A2.

<sup>13</sup> Type, A2; hours, 7 a. m. to 10 p. m.

<sup>14</sup> Loc. 74° 44' 37" W., 40° 19' 10" N.; type, A1, A2, A3.

<sup>15</sup> Loc. 118° 13' 57" W., 34° 04' 17" N.; type, A3.

<sup>16</sup> Loc. 120° 59' 51" E., 14° 34' 56" N.; type, A2.

<sup>17</sup> Loc. (approximate) 120° 58' 00" E., 14° 36' 00" N.; type, A2.

<sup>18</sup> Loc. (approximate) 120° 58' 20" E., 14° 36' 00" N.; type, A2.

<sup>19</sup> Loc. 120° 54' 08" E., 14° 35' 31" N.; type, A2.

<sup>20</sup> Loc. 122° 55' 30" E., 07° 30' 54" N.; type A2.

<sup>21</sup> Type, A2, A3.

<sup>22</sup> Loc. 80° 00' 29" W., 40° 25' 47" N.; type, A3.

<sup>23</sup> Loc. 126° 21' 50" E., 08° 29' 10" N.; type, A2.

<sup>24</sup> Loc. (approximate) 96° 24' 00" W., 42° 29' 00" N.; type, A3.

<sup>25</sup> Loc. 74° 26' 36" W., 40° 32' 42" N.; type, A3.

<sup>26</sup> Loc. (approximate) 125° 00' 00" E., 11° 14' 00" N.; type, A2; power, 12/1.5; hours, 7 a. m. to 10 p. m. daily; Sundays, and holidays 7 a. m. to 7 p. m.

<sup>27</sup> Loc. (approximate) 125° 25' 00" E., 13° 54' 00" N.; type, A2.

Commercial ship stations, alphabetically, by names of vessels

[Additions to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1930, 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—
Carrie-Finn	WBEX		P	X	Zane Grey	Owner.
Eunice	WBEX		P	X	do.	Do.
Fisherman II.	WBEU				do.	Do.
Ingomar <sup>1</sup>	WCEB		P	X	Albert L. Hoffman	Do.
Liberty	WBEZ		P	X	Boston Pilots Relief Society	Do.
Northern Sun.	WBEW	8	PG	X	Motor Tankship Corporation	
Pilot	WCEA		P	X	Boston Pilots Relief Society	Do.
Tatoosh	WCEC		P	X	Booth Fisheries Co. of Delaware	Northwestern Fisheries Co.

<sup>1</sup> Type, A1, A2; fy., 500 (600), 5,525 (54.3), 5,555 (54), 5,615 (53.43).

## Commercial aircraft stations, alphabetically, by names of craft

[Additions to the List of Radio Stations of the United States, edition of June 30, 1930, and to the International List of Aircraft Stations published by the Berne bureau]

Station	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	License
No. 1426 (No. 10845).....	KHLKP	-----	P	X	Pacific Air Transport (Inc.).
No. 1427 (No. 10846) <sup>1</sup> .....	KHLLO	3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178 (94.39), 5,570 (53.86), 5,660 (53).	P	X	Do.
No. 1428 (No. 10847) <sup>1</sup> .....	KHLMN		P	X	Do.

<sup>1</sup> Type, A3.

## Government land stations, alphabetically, by names of stations

[Addition to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1930, and to the International List of Fixed and Land Stations published by the Berne bureau]

Station	Class	Call signal	Frequency in kilocycles, meters in parenthesis	Service	Hours	Owner
Albuquerque, N. Mex.	FA, FX	KCAF	204 (1,470), 296 (1,015).....	O	N	Department of Commerce, Bureau of Lighthouses.
Butte, Mont.....	FA, FX	KCAC	240 (1,250), 284 (1,055), 3,370 (89), 3,380 (88.8), 5,930 (50.59), 5,940 (50.51).	O	N	Do.
Clovis, N. Mex.....	FA, FX	KCAG	204 (1,470), 248 (1,210).....	O	N	Do.
Idaho Falls, Idaho.....	FA, FX	KCAD	240 (1,250), 338 (890), 3,370 (89), 3,405 (88.11), 5,940 (50.51), 5,955 (50.36).	O	N	Do.
Kingman, Ariz.....	FA, FX	KCAH	228 (1,315), 302 (993).....	O	N	Do.
Memphis, Tenn.....	FA, FX	WWAU	240 (1,250), 326 (920), 3,350 (89.6), 3,370 (89), 5,940 (50.51), 5,960 (50.34).	O	N	Do.
Nashville, Tenn.....	FA, FX	WWAC	235 (1,275), 338 (890), 3,370 (89), 3,400 (88.2), 5,920 (50.68), 5,940 (50.51).	O	N	Do.
Pittsburgh, Pa.....	FA, FX	WWAP	214 (1,400), 254 (1,180).....	O	N	Do.
Santurce, P. R. (San Juan District, U. S. N. R.).	FX	NEC	-----	O	X	U. S. Navy.
Washington, D. C. (Washington district U. S. N. R.).	FX	NED	-----	O	-----	Do.
Waynoka, Okla.....	FA, FX	KCAI	204 (1,470), 266 (1,130).....	O	N	Department of Commerce, Bureau of Lighthouses.
Winslow, Ariz.....	FA, FX	KCAE	228 (1,315), 350 (855).....	O	N	Do.
Portable						
Puerto Rico <sup>1</sup> .....	FX	WWAX	375 (800), 410 (730), 500 (600).	O	X	Do.

<sup>1</sup> Type, A2.

## Government ship station, alphabetically, by name of stations

[Addition to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1930, and to the International List of Fixed and Land Stations published by the Berne bureau]

Station	Call signal	Frequency in kilocycles, meters in parenthesis	Service	Hours	Owner
Westdahl <sup>1</sup> .....	NIQP	500 (600).....	O	X	Department of Commerce, Coast and Geodetic Survey.

<sup>1</sup> Type, A2.

Commercial and Government land, ship, aircraft, radiobeacon, and radio-compass stations, alphabetically by call signals

Call signal	Name of station	Call signal	Name of station
KAAQ	Manila, P. I. .... fx	KZFF	Botocan, P. I. (Laguna) .... fx
KCAC	Butte, Mont. .... fa, fx	KZGB	Hook Bay, P. I. (Tayabas) .... fx
KCAD	Idaho Falls, Idaho .... fa, fx	KZGF	Manila, P. I. (radiotelephone) ....
KCAE	Winslow, Ariz. .... fa, fx	KZGG	Cebu, P. I. (Cebu) (radiotelephone) ....
KCAF	Albuquerque, N. Mex. .... fa, fx	KZGH	Iloilo, P. I. (Iloilo) .... fx
KCAG	Clovis, N. Mex. .... fa, fx	KZGI	Manila, P. I. .... fx
KCAH	Kingman, Ariz. .... fa, fx	KZGK	Cebu, P. I. (Cebu) .... fx
KCAI	Waynoka, Okla. .... fa, fx	KZGL	Iloilo, P. I. (Iloilo) .... fx
KGNA	Crane, Tex. .... fx	KZGM	Zamboanga, P. I. (Zamboanga) .... fx
KGNB	Wink, Tex. .... fx	KZGN	Davao, P. I. (Davao) .... fx
KGNC	Jal. N. Mex. .... fx	NEC	Santurce, P. R. (San Juan district U. S. N. R.) .... fx
KGPK	Sioux City, Iowa .... fx	NED	Washington, D. C. (Washington district U. S. N. R.) .... fx
KGPL	Los Angeles, Calif. .... fx	NIQP	Westdahl .... b
KGWA	San Francisco, Calif. .... fx	WBEU	Fisherman II. .... b
KGWB	Dallas, Tex. .... fx	WBEW	Northern Sun .... b
KGWC	Kansas City, Mo. .... fx	WBEX	Eunice .... b
KGWD	Denver, Colo. .... fx	WBEY	Carrie-Finn .... b
KGWE	Los Angeles, Calif. .... fx	WBEZ	Liberty .... b
KGWF	Minneapolis, Minn. .... fx	WCEA	Pilot .... b
KGWG	Seattle, Wash. .... fx	WCEB	Ingomar .... b
KGWH	Salt Lake City, Utah .... fx	WCEC	Tatoosh .... b
KHLEK	No. 1426 (NC-10345) .... a	WEEN	Stelton, N. J. .... fa
KHLLM	No. 1427 (NC-10346) .... a	WNB	Lawrenceville, N. J. (radiotelephone) .... fx
KHLMN	No. 1428 (NC-10347) .... a	WOX	New York, N. Y. (radiotelephone) .... fc
KTC	Tacloban, P. I. (Leyte) .... fx	WPDU	Pittsburgh, Pa. .... fx
KTE	Laog, P. I. (Hocos Norte) .... fx	WRDB	Washington, D. C. .... fx
KUX	Cagayan, P. I. (Misamis) .... fx	WRDC	Chicago, Ill. .... fx
KZFB	Kabasalan, P. I. (Zamboanga) .... fx	WRDD	Atlanta, Ga. .... fx
KZFC	Port Lamon, P. I. (Surigao) .... fx	WRDE	Cleveland, Ohio .... fx
KZFF	Manila, P. I. .... fx	WRDF	Memphis, Tenn. .... fx
KZFG	Fabrica, P. I. (Occidental Negros) .... fx	WRDG	Detroit, Mich. .... fx
KZFH	Iloilo, P. I. (Iloilo) .... fx	WRDH	Miami, Fla. .... fx
KZFQ	Manila, P. I. .... fx	WRDI	Philadelphia, Pa. .... fx
KZFR	Cebu, P. I. (Cebu) .... fx	WRDJ	Upper Newton Falls, Mass. .... fx
KZFS	Davao, P. I. (Davao) .... fx	WRDK	Little Neck, N. Y. .... fx
KZFT	Naga, P. I. (Camarines Sur) .... fx	WRDL	New Orleans, La. .... fx
KZFY	Tambang, P. I. (Camarines Sur) .... fx	WWAC	Nashville, Tenn. .... fa, fx
KZFX	Manila, P. I. .... fx	WWAP	Pittsburgh, Pa. .... fa, fx
	Lamit, P. I. (Camarines Sur) .... fx	WWAU	Memphis, Tenn. .... fa, fx
		WWAX	Porto Rico (portable) .... fx

Airway radiobeacon stations

[Additions to the List of Radio Stations of the United States, edition of June 30, 1930, and to the International List of Aircraft Stations published by the Berne bureau]

Station and geographical location	Frequency and type for emission	Power (height of aerial and intensity of current at base)	Characteristic signal	Hours
Albany, N. Y.; 73° 47' 51" W., 42° 44' 10" N.	A2-320 (940) ....		Interlocked N (—) and A (—), identifying letter I (—).	N.
Atlanta, Ga. (Hapeville); 84° 25' 41" W., 33° 38' 57" N.	A2-266 (1,130) ....		Interlocked N (—) and A (—), identifying letter H (—).	N.
Auburn, Calif.; 121° 06' 15" W., 38° 58' 06" N.	A2-272 (1,100) ....		Interlocked N (—) and A (—), identifying letter I (—).	N.
Bellefonte, Pa.; 77° 42' 27" W., 40° 53' 22" N.	A2-302 (995) ....		Interlocked N (—) and A (—), identifying letter R (—).	N.
Bellefonte, Pa. (visual radiobeacon); 77° 42' 27" W., 40° 53' 22" N.	A2-314 (955) ....		86.66 cycles in northwest and southeast quadrants, 65 cycles in northeast and southwest quadrants.	Operates upon request.

## Airway radiobeacon stations—Continued

[Additions to the List of Radio Stations of the United States, edition of June 30, 1930, and to the International List of Aircraft Stations published by the Berne bureau]

Station and geographical location	Frequency and type for emission	Power (height of aerial and intensity of current at base)	Characteristic signal	Hours
Boise, Idaho; 116°-11' 03" W., 43° 37' 18" N.	A2-308 (975)-----		Interlocked N (—) and A (—), identifying letter D (—).	N.
Boston, Mass. (East Boston); 71° 02' 06" W., 42° 22' 03" N.	A2-266 (1,130)-----		do.	N.
Buffalo, N. Y. (Williams-ville); 78° 43' 00" W., 42° 56' 41" N.	A2-350 (855)-----		do.	N.
Chattanooga, Tenn.; 85° 11' 42" W., 35° 02' 11" N.	A2-314 (955)-----		Interlocked N (—) and A (—), identifying letter Y (—).	N.
Cheyenne, Wyo.; 104° 50' 31" W., 41° 09' 16" N.	A2-326 (920)-----		do.	N.
Chicago, Ill. (Cicero); 87° 46' 30" W., 41° 48' 00" N.	A2-350 (855)-----		Interlocked N (—) and A (—), identifying letter F (—).	N.
Cincinnati, Ohio (California); 84° 25' 00" W., 39° 05' 00" N. (approximate).	A2-272 (1,100)-----		Interlocked N (—) and A (—), identifying letter S (—).	N.
Cleveland, Ohio; 81° 04' W., 41° 25' 00" N.	A2-344 (870)-----		Interlocked N (—) and A (—), identifying letter I (—).	N.
Columbia, Mo.; 92° 10' 19" W., 38° 59' 00" N.	A2-266 (1,130)-----		Interlocked N (—) and A (—), identifying letter U (—).	N.
Columbus, Ohio (Port Columbus); 82° 52' 48" W., 39° 59' 42" N.	do-----		do.	Operates on alternate minutes in synchronization with Indianapolis, Ind., radio range.
Des Moines, Iowa; 93° 32' 07" W., 41° 39' 54" N.	A2-308 (975)-----		Interlocked N (—) and A (—), identifying letter D (—).	N.
Detroit, Mich. (visual radio beacon); 83° 21' 00" W., 42° 13' 53" N.	A2-272 (1,100)-----		86.66 cycles in north and south quadrants, 65 cycles in east and west quadrants.	Operates upon request.
Elko, Nev.; 115° 46' 30" W., 40° 48' 46" N.	A2-314 (955)-----		Interlocked N (—) and A (—), identifying letter R (—).	N.
Erie, Pa. (Port Erie Airport).	A2-266 (1,130)-----		Interlocked N (—) and A (—), identifying letter H (—).	N.
Evansville, Ind.; 87° 32' 00" W., 38° 02' 00" N. (approximate).	A2-302 (995)-----		do.	N.
Fernley, Nev.; 119° 13' 00" W., 39° 37' 00" N. (approximate).	A2-296 (1,015)-----		Interlocked N (—) and A (—), identifying letter D (—).	N.
Fort Madison, Iowa; 91° 22' 38" W., 40° 37' 38" N.	A2-338 (890)-----		Interlocked N (—) and A (—), identifying letter H (—).	N.
Fort Worth, Tex.; 97° 20' 24" W., 32° 48' 57" N.	A2-350 (855)-----		Interlocked N (—) and A (—), identifying letter S (—).	N.
Fresno, Calif.; 119° 48' 55" W., 36° 43' 00" N.	A2-344 (870)-----		do.	N.
Goshen, Ind.; 85° 50' 00" W., 41° 37' 00" N. (approximate).	A2-332 (905)-----		Interlocked N (—) and A (—), identifying letter D (—).	N.
Greensboro, N. C. (Guilford); 79° 55' 52" W., 36° 05' 39" N.	A2-320 (940)-----		do.	N.
Indianapolis, Ind.; 86° 18' 21" W., 39° 43' 21" N.	A2-266 (1,130)-----		Interlocked N (—) and A (—), identifying letter I (—).	Operates on alternate minutes in synchronization with Columbus, Ohio, radio range.

Airway radiobeacon stations—Continued

[Additions to the List of Radio Stations of the United States, edition of June 30, 1930, and to the International List of Aircraft Stations published by the Berne bureau]

Station and geographical location	Frequency and type for emission	Power (height of aerial and intensity of current at base)	Characteristic signal	Hours
Kansas City, Mo. (Parkville); 94° 38' 24" W., 39° 09' 12" N.	A2-344 (870)-----	-----	Interlocked N (—) and A (—), identifying letter I (..).	N.
Key West, Fla.; 81° 47' 44" W., 24° 32' 50" N.	A2-338 (890)-----	-----	do.	Operates upon request.
Knight, Wyo.; 110° 48' 44" W., 41° 08' 41" N.	A2-260 (1,155)-----	-----	Interlocked N (—) and A (—), identifying letter H (....).	N.
Medicine Bow, Wyo.; 106° 11' 05" W., 41° 53' 07" N.	A2-296 (1,015)-----	-----	Interlocked N (—) and A (—), identifying letter U (—).	N.
Moran, Kans.; 95° 14' 06" W., 37° 55' 24" N.	A2-320 (940)-----	-----	Interlocked N (—) and A (—), identifying letter H (....).	N.
Nashville, Tenn.; 86° 37' 00" W., 36° 09' 00" N. (approximate).	A2-338 (890)-----	-----	Interlocked N (—) and A (—), identifying letter U (—).	N.
New York, N. Y. (Hadley Field, New Brunswick, N. J.); 74° 26' 05" W., 40° 33' 16" N.	-----do-----	-----	Interlocked N (—) and A (—), identifying letter H (....).	N.
North Platte, Nebr.; 100° 41' 41" W., 41° 07' 55" N.	A2-284 (1,055)-----	-----	do.	N.
Omaha, Nebr. (Bellevue); 95° 55' 26" W., 41° 07' 28" N.	A2-314 (955)-----	-----	Interlocked N (—) and A (—), identifying letter R (—).	N.
Pasco, Wash.; 119° 06' 38" W., 46° 14' 24" N.	A2-320 (940)-----	-----	Interlocked N (—) and A (—), identifying letter U (—).	N.
Richmond, Va. (Sandston); 77° 20' 20" W., 37° 30' 00" N. (approximate).	A2-260 (1,155)-----	-----	Interlocked N (—) and A (—), identifying letter R (—).	N.
Rock Springs, Wyo.; 109° 14' 00" W., 41° 37' 30" N. (approximate).	A2-350 (855)-----	-----	do.	N.
St. Louis, Mo. (Robertson); 90° 22' 02" W., 38° 44' 12" N.	A2-290 (1,035)-----	-----	Interlocked N (—) and A (—), identifying letter D (—).	N.
Salt Lake City, Utah; 111° 56' 21" W., 40° 46' 24" N.	-----do-----	-----	Interlocked N (—) and A (—), identifying letter S (....).	N.
Saugus, Calif.; 118° 32' 30" W., 34° 23' 31" N.	A2-266 (1,130)-----	-----	Interlocked N (—) and A (—), identifying letter D (—).	N.
Sidney, Nebr.; 102° 57' 42" W., 41° 07' 54" N.	A2-308 (975)-----	-----	Interlocked N (—) and A (—), identifying letter S (....).	N.
Spartanburg, S. C.; 81° 56' 35" W., 34° 57' 32" N.	A2-248 (1,210)-----	-----	do.	N.
Sterling, Ill.; 89° 41' 36" W., 41° 48' 57" N.	A2-272 (1,100)-----	-----	do.	N.
Summit, Calif.; 120° 19' 41" W., 39° 19' 07" N.	A2-338 (890)-----	-----	Interlocked N (—) and A (—), identifying letter H (....).	N.
Syracuse, N. Y. (Camillus); 76° 16' 00" W., 43° 04' 15" N.	A2-260 (1,155)-----	-----	Interlocked N (—) and A (—), identifying letter S (....).	N.
Terre Haute, Ind.; 87° 24' 54" W., 39° 28' 33" N.	A2-248 (1,210)-----	-----	Interlocked N (—) and A (—), identifying letter R (—).	N.
Tulsa, Okla. (Dawson); 95° 53' 12" W., 36° 11' 48" N.	A2-296 (1,015)-----	-----	Interlocked N (—) and A (—), identifying letter U (—).	N.
Washington, D. C. (Hunters Point, Va.); 77° 02' 20" W., 38° 50' 55" N.	A2-272 (1,100)-----	-----	Interlocked N (—) and A (—), identifying letter S (....).	N.
Wichita, Kans.; 97° 16' 38" W., 37° 39' 10" N.	A2-332 (905)-----	-----	Interlocked N (—) and A (—), identifying letter D (—).	N.
York, Nebr.; 97° 36' 12" W., 40° 53' 54" N.	A2-260 (1,155)-----	-----	Interlocked N (—) and A (—), identifying letter U (—).	N.

NOTE.—All of the above-named beacons are owned and operated by the Department of Commerce, Bureau of Lighthouses, Airways Division.

## Broadcasting stations, by name of State and city

[Addition to the List of Radio Stations of the United States, edition of June 30, 1930]

State and city	Call signal	Frequency in kilocycles, meters in parentheses	Power (watts)
Pennsylvania: Pittsburgh.....	WWSW	1,500 (200).....	100

## Broadcasting station, by call signal

Call signal	Location of transmitter (mail address)	Licensee	Frequency in kilocycles, meters in parentheses	Power (watts)
WWSW	Pittsburgh, Pa.....	William S. Walker.....	1,500 (200).....	100

## 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, 1930]

Station	Call signal	Frequency in kilocycles, meters in parentheses	Power (watts)	License and post-office address
<i>Portable</i>				
( <sup>1</sup> ).....	W2XDK	4,795 (62.56).....	15	Polin (Inc.), 2 East Fifty-fourth Street, New York, N. Y.
Massachusetts.....	W1XAB	1,662 (180.51).....	500	De Forest Radio Co., Passaic, N. J.
<i>Aircraft</i>				
No. 1928 (NC-5211)....	W10XAQ	2,398 (125.10), 3,256 (92.50), 6,425 (46.70), 12,850 (23.35).	50	Westinghouse Electric & Manufacturing Co.

<sup>1</sup> Portable transmitter to be used as a part of a telemetric radio indicating device cooperating with a receiving device in a plane.

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

Call signal	District and station	Call signal	District and station
			<i>Aircraft and portable</i>
W1XAB W2XDK	First district: Massachusetts. <sup>1</sup> Second district.	W10XAQ	No. 1928 (NC-5211). <sup>2</sup>

<sup>1</sup> Portable.<sup>2</sup> Aircraft.

## ALTERATIONS AND CORRECTIONS

## COMMERCIAL LAND STATIONS

[Alterations and corrections to be made to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1930, and to the International List of Fixed and Land Stations, published by the Berne bureau]

ABULUG, P. I., radio (Cagayan).—Class, add FX; fy., add 500 (600); power, 12/6; service, add PR; 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.

ALABAT, P. I., radio (Tayabas).—Power, 15/7; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.



- ALBUQUERQUE, N. MEX.—Loc., 106° 33' 42'' W., 35° 03' 40'' N.; fy., add 2,722 (110.21), 6,350 (47.24), 12,180 (24.63).
- ANGOLA, IND.—Power, 18/5.
- APARRI, P. I., radio (Cagayan).—Type, add A2; fy., add 500 (600), 4,765 (62.95), 5,275 (56.88), 6,905 (43.45); power, 12/7; hours, 7 a. m. to 10 p. m. daily, 7 a. m. to 7 p. m. Sundays and holidays.
- ATLANTA, GA. (Candler Field).—Fy., strike out 278 (1080), add 2,326 (128.97), 2,344 (127.98), 4,140 (72.46), 6,260 (47.92), 6,275 (47.8), 12,210 (24.57).
- AURORA, ILL.—Fy., add 3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178 (94.39), 5,770 (53.86), 5,660 (53).
- BACUIT, P. I., radio.—Loc., changed to read Bacuit, P. I., radio (Palawan); class, add FX; type, strike out A2, add A1; power, 24/2.5; service, add PR; hours, 8 to 12 a. m., 2 to 5 p. m., daily, 9 to 11 a. m. Sundays and holidays.
- BAKERSFIELD, CALIF. (Kern County Airport).—Licensee, Aeronautical Radio (Inc.).
- BALABAC, P. I., radio (Palawan).—Power, 55/8; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- BALANGIGA, P. I., radio (Samar).—Power, 20/2; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- BALER, P. I., radio (Tayabas).—Class, add FX; type, strike out A2; power, 21.2/2.25; service, add PR; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- BARTLESVILLE, OKLA.—Fy., strike out 169 (1,775), add 182 (1,650), 186 (1,615), 188 (1,595), 193 (1,555); licensee, Western Radio Telegraph Co.
- BASCO, P. I., radio (Batanes).—Power, 60/12; hours, 8 to 12 a. m., 2 to 5 p. m., daily, 9 to 11 a. m. Sundays and holidays, ship schedule last 10 minutes of each hour and continuous watch from 10 p. m. to 7 a. m. daily, 7 p. m. to 7 a. m. Sundays and holidays.
- BATANGAS, P. I., radio (Batangas).—Fy., 300 (1,000), 463 (650), 500 (600); power, 40/9; hours, 7 a. m. to 10 p. m. daily, 7 a. m. to 7 p. m. Sundays and holidays, ship schedule add continuous watch from 10 p. m. to 7 a. m. daily, 7 p. m. to 7 a. m. Sundays and holidays.
- BELLE ISLE, MICH.—Loc., change to read Detroit (Belle Isle), Mich., (approximate) 82° 59' 00'' W., 42° 20' 00'' N.
- BONGAO, P. I., radio (Sulu).—Fy., add 316 (950); power, 50/6; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- BORGER, TEX. (near).—Fy., strike out 169 (1,775), add 182 (1,650), 186 (1,615), 188 (1,595), 193 (1,555); licensee, Western Radio Telegraph Co.
- BORONGAN, P. I., radio (Samar).—Power 20/2; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- BOSTON, MASS. (municipal airport).—Class, strike out FX.
- BRECKENRIDGE, TEX.—Fy., strike out 169 (1,775), add 186 (1,615), 188 (1,595), 193 (1,555); licensee, Western Radio Telegraph Co.
- BURBANK, CALIF. (Los Angeles) KGUR.—Class, add FA; fy., add 3,452 (86.9), 3,460 (86.7), 3,468 (86.5), 3,484 (86.1), 5,600 (53.57), 5,630 (53.28); power, 18/2.5.
- BUTUAN, P. I.—Loc., change to read Butuan, P. I., radio (Agusan); class, FC, FX; type, strike out A1, add A2; fy., strike out 6,993 (42.9), add 4,775 (62.83); power 21/1; service, PG, PR; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays; rates, 8 cents per word.
- CAGAYAN DE SULU, P. I., radio (Sulu).—Loc., change to read Cagayan, P. I. radio (Sulu); power, 55/6; hours, 8 to 12 a. m., 2 to 5 p. m. daily; 9 to 11 a. m. Sundays and holidays; rates, 8 cents per word.
- CALAPAN, P. I., radio (Mindoro).—Fy., add 333.3 (900); power, 10/3; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- CAMDEN, N. J.—Class, add FX; fy., strike out 278 (1,080), 393 (765), 400 (750), 414 (725), 420 (715), 3,484 (86.5), add 2,722 (110.21), 2,734 (109.73), 3,088 (97.15), 4,108 (73.03).
- CAMIGUIN ISLAND, P. I.—Loc., change to read Camiguin, P. I. (Cagayan); type, strike out A1, add A2; fy., 8,610 (34.82).
- CARAMOAN, P. I., radio (Camarines Sur).—Power, 24/8; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- CATANAUAN, P. I., radio (Tayabas).—Fy., add 500 (600); power, 24/9; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- CATBALOGAN, P. I., radio (Samar).—Power, 20/1.5; hours, 8 to 12 a. m., 2 to 5 p. m. daily; 9 to 11 a. m. Sundays and holidays.

- CEBU, P. I., radio.**—Type, strike out A1, add A2; fy., 125 (2,000), 182.9 (1,642), 250 (1,200), 300 (1,000), 500 (600), 4,775 (62.825), 5,385 (55.71), 5,395 (55.61), 5,475 (54.79), 5,485 (54.69), 5,495 (54.59), 6,695 (44.81), 6,950 (43.17), 7,385 (40.62); power, 21/3; hours, 7 a. m. to 10 p. m. daily, 7 a. m. to 7 p. m. Sundays and holidays, ship schedule 40 to 50 minutes of each hour and continuous watch from 10 p. m. to 7 a. m. daily, 7 p. m. to 7 a. m. Sundays and holidays.
- CHATHAM, MASS., radio.**—Power, 91.46/5 and 8.
- CHICAGO, ILL. (WJA).**—Power, 100/2.5.
- CHICAGO, ILL. (WJC).**—Power, 18.46/2.5; fy., add 7,640 (39.27), 7,925 (37.85), 15,580 (19.255), 15,850 (18.927).
- COLUMBUS, OHIO (WAEB).**—Fy., add 3,088 (97.15), 5,540 (54.15).
- CORON, P. I., radio.**—Loc., change to read Coron P. I. Radio (Palawan).—Class, add FX; type, strike out A1; power, 24/2.25; service, add PR; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- CRESSON, PA.**—Fy., strike out 393 (765), 400 (750), 414 (725), 420 (715), add 3,082 (97.33), 3,088 (97.15), 5,540 (54.15); power, 18/6.
- CULION, P. I., radio (Palawan).**—Fy., add 333.3 (900); power, 40/6; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- CUYO, P. I., radio (Palawan).**—Power, 35/8; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- DAPA, P. I., radio (Surigao).**—Fy., 313 (960); power, 15/6; hours, 8 to 12 a. m., 2 to 5 p. m. daily; 9 to 11 a. m. Sundays and holidays.
- DAPITAN, P. I., radio (Zamboanga).**—Power, 23/5; hours, 8 to 12 a. m., 2 to 5 p. m. daily; 9 to 11 a. m. Sundays and holidays.
- DAVAO, P. I., radio (Mindanao).**—Fy., strike out 6,383 (47), add 5,005 (59.94), 5,065 (59.23), 5,085 (59.02), 6,880 (43.6), 9,230 (32.5); power, 35/15; hours, 7 a. m. to 10 p. m. daily, 7 a. m. to 7 p. m. Sundays and holidays; ship schedule add continuous watch from 10 p. m. to 7 a. m. daily, 7 p. m. to 7 a. m. Sundays and holidays.
- DOUGLAS, ARIZ.**—Fy., strike out 278 (1,080), 3,088 (97.15), 3,460 (86.7), 6,350 (47.24), 8,015 (37.43), 12,180 (24.63), add 5,600 (53.57); power, 18/3.
- EDMONDS, WASH., radio.**—Loc. (approximate), 120° 19' 00" W., 47° 49' 00" N.
- ELDORADO, KANS.**—Fy., strike out 157 (1,910), 187.92 (1,600), add 182 (1,650), 186 (1,615), 188 (1,595), 193 (1,555); licensee, Western Radio Telegraph Co.
- ELKO, NEV. (municipal airport).**—Class, strike out FX; fy., strike out 278 (1,080), add 3,160 (94.9), 3,166 (94.75), 3,178 (94.39), 5,570 (53.86).
- FRESNO, CALIF. (Chandler Field).**—Power, 18/3.5.
- FRIJOLE, TEX.**—Power, 18/2.5; fy., strike out 278 (1,080).
- GALVESTON, TEX., radio.**—Power, 50.3/7.5.
- GARDEN CITY, N. Y., radio.**—Loc., 73° 36' 57" W., 40° 43' 46" N.
- GUAM, GUAM.**—Loc. (approximate), 144° 43' 30" E., 13° 28' 30" N.; fy., add 18,820 (15.940), type, A1, A2; power, 22/1.5; service, P; hours, X.
- HARRISBURG, PA. (WAED).**—Fy., strike out 278 (1,080), 393 (765), 400 (750), 414 (725), 420 (715), fy., add 3,088 (97.15).
- HINATUAN, P. I., radio (Surigao).**—Power, 20/2; hours, 8 to 12 a. m., 2 to 5 p. m. daily; 9 to 11 a. m. Sundays and holidays.
- HOUSTON, TEX. (municipal airport).**—Fy., strike out 278 (1,080), 3,484 (86.1), 5,600 (53.57), add 2,326 (128.97), 2,344 (127.98), 4,140 (72.46), 6,260 (47.92), 6,275 (47.8), 12,210 (24.57).
- ILOILO, P. I. radio.**—Type, strike out A1, add B; fy., add 125 (2,400), 153.8 (1,950), 187.5 (1,600), 250 (1,200), 316 (950), 4,705 (63.76), 5,325 (56.34), 6,840 (43.86); hours, 7 a. m. to 10 p. m. daily, 7 a. m. to 7 p. m. Sundays and holidays, ship schedule, add continuous watch from 10 p. m. to 7 a. m. daily, 7 p. m. to 7 a. m. Sundays and holidays.
- INDIANAPOLIS, IND. (WAEA).**—Class FA, FX; fy., strike out 278 (1,080), 3,468 (86.5), 5,510 (54.44), add 2,722 (110.21), 2,734 (109.72), 3,088 (97.15), 4,108 (73.02), 5,540 (54.15); power, 18/6.
- INDIO, CALIF. (KGUQ).**—Fy., add 3,484 (86.1), 5,630 (53.28), power, 20/5.
- INFANTA, P. I., radio (Tayabas).**—Fy., add 125 (2,400), power, 23/5; hours, 8 to 12 a. m., 2 to 5 p. m. daily; 9 to 11 a. m. Sundays and holidays.
- ISABELLA DE BASILAN, P. I., radio (Zamboanga).**—Fy., strike out 1,500 (200), add 750 (400), power, 10/5; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- JACKSON, MISS.**—Fy., add 3,484 (86.1), 5,630 (53.29).
- JOLO, P. I., radio (Jolo Island).**—Fy., strike out 316 (950), 333 (900), 353 (850), add 400 (750); power, 35/9; hours, 8 to 12 a. m., 2 to 5 p. m. daily; 9 to 11 a. m. Sundays and holidays.

- KINGMAN, ARIZ. (KGTL).**—Fy., add 2,722 (110.21), 2,734 (109.72), 4,108 (73.02), 6,350 (47.24), 8,015 (37.43), 12,180 (24.63); power, 18/2.5.
- KINGS MILL, TEX.**—Fy., strike out 6,243.5 (48.05); add 5,075 (59.11), 5,085 (58.99), 5,780 (51.9), 5,795 (51.76), 5,810 (51.63); licensee, Western Radio Telegraph Co.
- LARENA, P. I.**—Loc., change to read Larena, P. I. Radio; class FX; fy., add 214 (1,140), 700 (450); power, 24/2; service, add PR; hours, 8 to 12 a. m., 2 to 5 p. m. daily; 9 to 11 a. m. Sundays and holidays.
- LEBAK, P. I., radio.**—Loc., change to read Lebak, P. I. Radio (Cotabato); fy., add 333 (900); power 40/10 hours, 8 to 12 a. m., 2 to 5 p. m. daily; 9 to 11 a. m. Sundays and holidays.
- LEGASPI, P. I., radio.**—Loc., change to read Legaspi, P. I. Radio (Albay); fy., strike out 6,742 (44.5); add 4,665 (64.31), 5,960 (50.34); power, 18/3; hours, 7 a. m. to 10 p. m. daily; 7 a. m. to 7 p. m. Sundays and holidays, ship schedule, add continuous watch from 10 p. m. to 7 a. m. daily, 7 p. m. to 7 a. m. Sundays and holidays.
- LITTLE NECK, N. Y. (WJU).**—Fy., add 15,580 (19.255).
- LOS ANGELES, CALIF. (KOS).**—Fy., strike out 15,880 (18.892); add 7,625 (39.34).
- LOS ANGELES, CALIF. (KPG).**—Fy., add 7,340 (40.87), 7,355 (40.79), 7,370 (40.71), 7,820 (38.36), 7,835 (38.29), 7,850 (38.22), 7,955 (37.72), 15,580 (19.25), 15,610 (19.21), 15,640 (19.18), 15,670 (19.14), 15,700 (19.10), 15,730 (19.07), 15,760 (19.03), 15,880 (18.892), 15,910 (18.856).
- LOS ANGELES, CALIF. (ALHAMBRA AIRPORT).**—Loc., 118° 06' 45" W., 34° 04' 30" N.; fy., add 2,722 (110.21).
- LUMARAO, P. I.**—Class, FX; loc. (approximate), 123° 06' 00" E., 7° 30' 00" N.; fy., 1,765 (170); hours, X.
- MALABANG, P. I., radio (Mindanao Island).**—Power, 35/8; hours, 8 to 12 a. m., 2 to 5 p. m. daily; 9 to 11 a. m. Sundays and holidays.
- MALITA, P. I., radio (Davao).**—Power, 12/8; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- MAMBAJAO, P. I., radio.**—Loc., change to read Manbajo, P. I., radio (Oriental Misamis); class, add FX; fy., 273 (1,100), 400 (750), 570 (525); power, 24/9; service, add PR; hours, 8 to 12 a. m. daily, 9 to 11 a. m. Sundays and holidays.
- MANILA, P. I., radio (KAA).**—Fy., 125 (2,400), 474 (635), 500 (600), 5,645 (53.15), 8,330 (36.01), 11,290 (26.57), 16,935 (17.715).
- MANILA, P. I. (KAX).**—Fy., strike out 19,930 (15.053).
- MANILA, P. I. (KAZ).**—Fy., strike out 9,970 (30.09).
- MANILA, P. I. (KBI).**—Fy., strike out 21,130 (14.198).
- MANILA, P. I. (KBK).**—Fy., strike out 6,690 (44.84).
- MANILA, P. I. (KTO).**—Fy., strike out 10,910 (27.5).
- MANILA, P. I. (KTP).**—Fy., strike out 7,980 (37.59).
- MANILA, P. I., radio KTY.**—Loc., 120° 58' 42" E., 14° 18' 19" N.; strike out A2; fy., 5,585 (53.72), 5,975 (50.21), 7,580 (39.58), 7,595 (39.47), 7,880 (38.07), 8,360 (35.89), 9,190 (32.64), 11,170 (26.86), 13,270 (22.61), 16,210 (18.507), 16,755 (17.905), 17,600 (17.045), 18,140 (16.538), 20,580 (14.577).
- MANILA, P. I., radio (KUH).**—Class, strike out FX; fy., 432.6 (693.84), 500 (600), 5,555 (54), 8,345 (35.95), 11,110 (27), 16,665 (18), 22,880 (13.112).
- MANILA, P. I., radio (KUZ).**—Loc., change to read Manila, P. I., class, strike out FC, add FX; fy., 4,615 (65.01); service, strike out PG, add PR.
- MANILA, P. I. (KZFM).**—Loc., 120° 59' 52" E., 14° 33' 58" N.; type, A2; fy., 4,825 (62.18), hours, X.
- MATI, P. I., radio (Davao).**—Power, 14/6; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- MCCAMEY, TEX.**—Fy., strike out 6,243.5 (48.05), add 5,075 (59.11), 5,085 (58.99), 5,780 (51.9), 5,795 (51.76), 5,810 (51.63); licensee, Western Radio Telegraph Co.
- MILBUK, P. I. (Cotabato).**—Loc., change to read Milbuk, P. I. (Occidental Negros).
- MOBILE, ALA., radio.**—Fy., strike out 147 (2,040), 4,148 (72.324), 11,290 (26.57), 22,580 (13.286); service, strike out PR.
- MUSSEL ROCK, CALIF. Radio.**—Power, 20/1.5.
- NAGA-NAGA, P. I.**—Loc., change to read Naga-Naga, P. I. (Zamboanga); type, strike out A1, add A2; fy., 4,735 (63.36).
- NEWARK, N. J. (WAEF).**—Class, FA, FX; fy., add 2,722 (110.21), 2,734 (109.72), 4,108 (73.02).
- NEW LONDON, CONN., radio.**—Power, 29.26/10.
- NEW YORK, N. Y., radio (Borough of Brooklyn) WNY.**—Fy., strike out 4,188 (71.63), 12,550 (23.9), 5,525 (54.298), 11,050 (27.15), add 170 (1,765).

- OMAHA, NEBR.** (Fort Crook Air Mail Field).—Fy., strike out 278 (1,080), add 2,482 (120.87), 2,506 (119.71), 3,160 (94.9), 3,166 (94.75), 3,178 (94.39), 4,124 (72.74), 5,570 (53.86), 6,215 (48.27), 6,230 (48.15); power, 18/5; licensee, Aeronautical Radio (Inc.).
- ORLANDO TOWNSHIP, ILL.**—Fy., strike out 278 (1,080), fy., add 3,166 (94.75), 3,172 (94.57), 3,178 (94.39), 5,570 (53.86), 5,660 (53); power, 20/5.
- PANDAN, P. I., radio** (Catanduanes Islands).—Loc., change to read Pandan, P. I., Radio (Albay); fy., 272.7 (1,100), 353 (850), 545 (550); power, 24/9; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- PANHANDLE CITY, TEX.**—Loc., changed to Marland Camp (Borger), Tex. (approximate) 101° 26' 00'' W., 35° 37' 40'' N.; fy., strike out 6,603.5 (45.43), add 5,075 (59.11), 5,085 (58.99), 5,780 (51.9), 5,795 (51.76), 5,810 (51.63); license, Western Radio Telegraph Co.
- PASAY, P. I.**—Loc., change to read Pasay, P. I. (Rizal) 120° 55' 12'' E., 14° 31' 50'' N.; 4,935 (60.79), 4,955 (60.55), 4,995 (60.06), 5,705 (52.59), 5,720 (52.45), 5,870 (51.11), 5,885 (50.98), 6,725 (44.61), 6,995 (42.89), 7,775 (38.59), 9,630 (31.15), 9,690 (30.96); hours, 7 a. m. to 10 p. m. daily, 7 a. m. to 7 p. m. Sundays and holidays.
- PEREZ, P. I., radio** (Tayabas).—Fy., 300 (1,000), 500 (600), 600 (500); hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- POLILLO, P. I., radio** (Tayabas).—Fy., strike out 315.8 (950); hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- PONCA CITY, OKLA. (KFE)**.—Fy., strike out 6,603.5 (45.43), add 5,075 (59.11), 5,085 (58.99), 5,780 (51.9), 5,795 (51.76), 5,810 (51.63).
- PUERTO PRINCESA, P. I., radio** (Palawan).—Fy., add 333.3 (900); power, 50/8; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- REDDING, CALIF.** (municipal airport).—Class, strike out FX; fy., strike out 278 (1,080), add 3,160 (94.9), 3,166 (94.75), 3,178 (94.39), 5,570, (53.86).
- RENO, NEV.** (Hubbard Field).—Class, FA, FX; fy., add 2,482 (120.87), 2,506 (119.71), 4,124 (72.74), 6,215 (48.27), 6,230 (48.15).
- ROBERTSON, Mo.**—Class, add FX; fy., strike out 278 (1,080), 393 (765), 400 (750), 414 (725), 420 (715), 3,468 (86.5), add 2,722 (110.21), 2,734 (109.73), 3,088 (97.15), 4,108 (73.03); power, 18/5.
- ROCK SPRINGS, WYO.** (municipal airport).—Class, strike out FX; fy., strike out 278 (1,080), add 3,160 (94.9), 3,166 (94.75), 3,178 (94.39), 5,570 (53.86).
- ROGERS CITY, Mich., radio.**—Fy., strike out 4,116 (72.886), 8,630 (34.76), add 143 (2,100); service, strike out P; licensee, Central Radio Telegraph Co.
- SACRAMENTO, CALIF. (KWO)**.—Licensee, Transpacific Communication Co. (Ltd.)
- SALT LAKE CITY, Utah (KGTH)**.—Fy., strike out 5,510 (54.44), add 5,540 (54.15).
- SALT LAKE CITY, UTAH.** (municipal airport).—Class, FA, FX; fy., strike out 278 (1,080), add 2,482 (120.87), 2,506 (119.71), 3,160 (94.9), 3,166 (94.75), 3,178 (94.39), 4,124 (72.74), 5,570 (53.86), 6,215 (48.27), 6,230 (48.15).
- SAN FRANCISCO, CALIF. (KGPE)**.—Licensee, City of San Francisco, department of electricity.
- SAN FRANCISCO, CAMOTES, P. I., radio** (Cebu).—Loc., change to read San Francisco, P. I. Radio (Cebu); fy., add 1,000 (300); hours, 8 to 12 a. m., 2 to 5 p. m. daily; 9 to 11 a. m. Sundays and holidays.
- SAN JOSE, P. I., radio** (Mindoro Island).—Loc. 121° 02' 15'' E., 12° 27' 15'' N.; fy., strike out 214 (1,400), add 214.5 (1,400); power, 50/8; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- SAN JUAN P. R., (Pan American Airport)**.—Class, FA, FX; fy., strike out 6,350 (47.24), add 3,076 (97.52), 4,164 (72.04), 6,305 (47.58), 6,320 (47.46).
- SEATTLE, WASH. (KGPA)**.—Fy., strike out 1,596 (187.97).
- SHERWOOD, OREG., radio.**—Loc. (approximate) 122° 49' 00'' W., 45° 22' 00'' N.
- SHREVEPORT, LA.**—Class, Strike out FX; fy., strike out 278 (1,080).
- SIASI, P. I., radio** (Sulu).—Loc., 120° 48' 55'' E., 05° 32' 32'' N.; fy., 262 (1,145), 500 (600), 666 (450); power, 30/6; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- SIPACO, P. I.**—Loc., change to read Sipaco, P. I. (Camarines Sur), (approximate) 123° 29' 30'' E., 10° 23' 00'' N.; fy., 4,825 (62.18); hours, X.
- SKELLYTOWN, TEX.**—Fy., strike out 187.62 (1,600), add 182 (1,650), 186 (1,615), 188 (1,595), 193 (1,555); license, Western Radio Telegraph Co.
- SOGOD, P. I., radio** (Leyte).—Type, strike out A2; power, 23/1.5; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- SPRINGFIELD, Mo.**—Class, FA, FX; fy., add 2,722 (110.21), 2,734 (109.72), 3,088 (97.15), 4,108 (73.02), 5,540 (54.15); power, 20/5.

- SUMAGUI, P. I. (Mindoro).—Correct orthography Sumagi; type, strike out A1, add A2.
- SUMMIT, N. J.—Loc., change to Plainfield, N. J. (near).
- SUNBURY, PA.—Loc., change to Lewisburg, Pa. (near).
- SURIGAO, P. I., radio (Surigao).—Type, strike out A arc, add A1, A2; fy., strike out 226.4 (1,325), add 226.5 (1,325), 4,775 (62.825); power, 23/5; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- TANDAG, P. I., radio (Surigao).—Fy., strike out 324.3 (925), 387.1 (775), add 250 (1,200), 400 (750); power, 14/8; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- TILIK, P. I.—Loc., change to read Tilik, P. I., radio (Mindoro); class, add FX; power, 24.4/2.5; service, add PR; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays, ship schedule 10 to 20 minutes of each hour.
- TOLONG, P. I.—Loc., change to read Tolong, P. I. (Oriental Negros), 122° 18' 40" E., 9° 22' 15" N.; type, strike out A1, add A2; fy., strike out 7,009 (42.8), add 4,705 (63.76); power, 8/1; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- TUCKERTON, N. J., radio.—Fy., strike out 6,485 (46.26).
- TULSA, OKLA. (WEH).—Fy., strike out 187 (1,600), add 182 (1,650), 186 (1,615), 188 (1,595), 193 (1,555); licensee, Western Radio Telegraph Co.
- TUSCALOOSA, ALA.—Class, strike out FX; fy., strike out 278 (1,080), power, 18/5.
- VIRAC, P. I., radio (Abay).—Power, 14/4; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- WICHITA, KANS.—Fy., strike out 5,510 (54.44), add 5,540 (54.15).
- WICHITA FALLS, TEX., (KYU).—Loc., change to Burkburnett, Tex.; fy., strike out 6,664 (45.02), add 5,075 (59.11), 5,085 (58.99), 5,780 (51.9), 5,795 (51.76), 5,810 (51.63), licensee, Western Radio Telegraph Co.
- WINSLOW, ARIZ.—Power, 18/5.
- ZAMBOANGA, P. I., radio (Mindanao Island).—Loc., change to read Zamboanga, P. I., Radio (Zamboanga); type, strike out A1; fy., strike out 240 (1,250), 6,000 (50), add 4,735 (63.36), 5,045 (59.47), 5,255 (57), 6,860 (43.73), 9,330 (32.15); power, 15/1.5; hours, 7 a. m. to 10 p. m. daily, 7 a. m. to 7 p. m. Sundays and holidays, ship schedule first 10 minutes of each hour, also continuous watch from 10 p. m. to 7 a. m. daily, 7 p. m. to 7 a. m. Sundays and holidays.
- ZUMARRAGA, P. I.—Loc. change to read Zumarraga, P. I., radio (Samar); class, add FX; type, strike out A1; service, add PR; hours, 8 to 12 a. m., 2 to 5 p. m. daily, 9 to 11 a. m. Sundays and holidays.
- STRIKE out all particulars of the following-named stations: Barstow, Calif.; Ceiba, P. R., radio; East St. Louis, Ill.; Fort Morgan, Ala., radio; Glendale, Calif.; Jersey City, N. J.; Kahuku, Hawaii (KDE); Kansas City, Mo. (KGNJ); Lodi, Calif.; Mackinac Island, Mich., radio; Marysville, Calif.; Miami, Fla. (WNSA); Newark, N. J. (WHV); St. Thomas, V. I.; San Antonio, Tex. (KGOH); San Antonio, Tex. (KGOY); San Diego, Calif. (KGJA); San Juan, P. R. (WGD); Santa Rosa, Calif.; Syracuse, N. Y.; Vieques, P. R., radio; California (KGQY) (portable); Louisiana and Texas No. 13 (portable); Louisiana and Texas No. 14 (portable); Louisiana and Texas No. 15 (portable); Louisiana and Texas No. 16 (portable); Louisiana and Texas No. 17 (portable); Louisiana and Texas No. 18 (portable); San Antonio, Tex. (portable); United States No. 6—throughout (portable); United States No. 10—throughout (portable); United States No. 11—throughout (portable); United States No. 12—throughout (portable); United States No. 13—throughout (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, 1930, and to the International List of Ship Stations, published by the Berne bureau]

- ALDER.—Fy., strike out 454 (660), add 159 (1,885); power, 20/15.
- A. L. KENT.—Type, add A1; power, 20/6.
- ALPENA.—Service, PG; rates, Great Lakes service, 4 cents per word.
- ALTAIR.—Type, add A1.
- AMASA STONE.—Accounts, R. M. C. A.
- AMBRIDGE.—Power, 24/12.
- AMERICAN LEGION.—Power, 30/15 and 12.
- ANN ARBOR No. 5.—Accts., Ann Arbor R. R. Co.; rates, Great Lakes service, 6 cents per word.
- ANN ARBOR No. 6.—Accts., Ann Arbor R. R. Co.

- ARAS.**—Type, A1, A2; fy., 143 (2,100), 151 (1,985), 153 (1,960), 157 (1,910), 160 (1,875), 375 (800), 400 (750), 425 (705), 468 (640), 500 (600), 5,525 (54.3), 8,290 (36.19), 8,330 (36.01), 8,450 (35.5), 11,050 (27.15), 11,110 (27), 11,230 (26.71), 13,240 (22.66), 16,580 (18.094), 16,860 (17.794); power, 25/10 and 3; service, PG; hours, X; rates, 8 cents per word; accts. R. M. C. A.  
**ARCTIC.**—Hours, add N.  
**ARDEN.**—Fy., add 159 (1,885); power, 24/8.  
**ASHTABULA.**—Accts., R. M. C. A.  
**ATLANTIC (KGMP).**—Type, add A2; fy., strike out 11,050 (27.15), 11,110 (27) add 16,580 (18.094), 16,660 (18.007); power, 12.33/2.  
**ATLANTIC (WQBG).**—Power, 35/8.  
**BAINBRIDGE.**—Accts., R. M. C. A.  
**BALSAM.**—Accts., R. M. C. A.  
**BARRALLTON.**—Type, strike out A3; fy., add 500 (600); accts., R. M. C. A.  
**BARRON F.**—Type, strike out A1.  
**BARRYTON.**—Accts., R. M. C. A.  
**BASCOBEL.**—Service, strike out PG, add P.  
**BEACON.**—Type, Add A1; fy., add 151 (1,985).  
**BEACONOIL.**—Type, add B; fy., add 468 (640).  
**BELLE ISLE.**—Type, A1, A2; fy., 5,525 (54.3), 5,555 (54), 8,330 (36.01), 11,050 (27.15), 11,110 (27), 16,580 (18.094), 16,660 (18.007); power, 20/5.  
**BETTY R.**—Type, add A2; fy., strike out 3,420 (87.7).  
**BONNIE BROOK.**—Accts., R. M. C. A.  
**BRANT (KGNT).**—Type, add A1; fy., strike out 375 (800), 425 (705), 454 (660), 500 (600), add 2,320 (129.3), 5,525 (54.3), 5,615 (53.42); power, 6/75; service, strike out PG, add P; accts. Alaska Packers Assn.  
**BROOKLINE.**—Type, A1, A2; fy., 375 (800), 400 (750), 425 (705), 468 (640), 500 (600); power, 18/5.  
**BUTTERCUP.**—Fy., add 500 (600), accts., R. M. C. A.  
**BYRON D. BENSON.**—Type, add A1.  
**CALICHE.**—Power, 25/4 and 8.  
**CALIFORNIA (KUKV).**—Type, add A1; fy., add 5,555 (54).  
**CAPILLO.**—Power, 24/18.  
**CAROLINA.**—Accts., R. M. C. A.  
**CERRO AZUL.**—Type, add A1; hours, add N.  
**CHARLES E. HARWOOD.**—Type, add A1.  
**CHARLES G. BLACK.**—Type, add A1.  
**CHARLES M. SCHWAB.**—Accts., R. M. C. A.  
**CHARLES PRATT.**—Type, add A1.  
**CHEROKEE.**—Type, add A1; fy., add 400 (750), 468 (640); power, 26/4 and 8.  
**CHESTER O. SWAIN.**—Type, add A1.  
**CHILKAT.**—Type, strike out B, add A2; power, 10/1.5.  
**CHINA ARROW.**—Type, add A1; fy., strike out 454 (660).  
**CHRISTOPHER COLUMBUS.**—Accts., R. M. C. A.  
**CITY OF BENTON HARBOR.**—Accts., R. M. C. A.  
**CITY OF CLEVELAND III.**—Accts., R. M. C. A.  
**CITY OF DETROIT III.**—Accts., R. M. C. A.  
**CITY OF GRAND RAPIDS.**—Type, add A1; accts., R. M. C. A.  
**CITY OF HOLLAND.**—Accts., R. M. C. A.  
**CITY OF NEW YORK (WQDC).**—Power, 26/14.  
**CITY OF RAYVILLE.**—Type, add A2.  
**CITY OF ST. JOSEPH.**—Accts., R. M. C. A.  
**CITY OF ST. LOUIS.**—Power, 26/12.  
**CITY OF SAUGATUCK.**—Accts., R. M. C. A.  
**CLAIRTON.**—Hours, strike out N.  
**COL. JAMES M. SCHOONMAKER.**—Accts., R. M. C. A.  
**COLOMBIA.**—Fy., add 5,555 (54.3), 5,555 (54).  
**COLONEL JAMES PICKANDS.**—Accts., R. M. C. A.  
**COMET.**—Type, A1, A2; fy., 375 (800), 400 (750), 425 (705), 468 (640), 500 (600); power, 26.8/11.  
**COOT.**—Fy., strike out 468 (640), add 400 (750); power, 15/3.  
**COQUINA.**—Fy., add 454 (660).  
**CORINTO.**—Power, 23/6; hours, add X.  
**CORMORANT.**—Type, add A1; power, 15/5.  
**CRESCENT CITY.**—Type, add A1; power, 20/5; accts., R. M. C. A.  
**CROWN CITY.**—Fy., strike out 355 (845); power, 21/10.  
**DARTMOUTH.**—Fy., add 500 (600); power, 15/4.

- DEAN EMERY.—Type, add A1.  
 D. E. CALLENDER.—Accts., R. M. C. A.  
 DELPHINE.—Accts., R. M. C. A.  
 DIAMOND HEAD.—Type, strike out A1; fy., add 454 (640); hours, add X.  
 DILWORTH.—Type, strike out A, arc, add A1, A2; fy., 375 (800), 425 (705), 468 (640), 500 (600); power, 27/7.  
 DURANGA.—Fy., add 468 (640); power, 26/10.  
 EASTERN GLADE.—Hours, N.  
 EAST INDIAN.—Accts., R. M. C. A.  
 EASTERN STATES.—Accts., R. M. C. A.  
 EAST SIDE.—Power, 22/16.  
 EDWARD L. SHEA.—Power, 28/9.  
 E. G. MATHIOTT.—Accts., R. M. C. A.  
 EL ALBA.—Power, 28/6.  
 ELEANOR CHRISTENSON.—Fy., add 454 (660).  
 EL CAPITAN (WICF).—Power, 19/6.  
 ELDA (WQDS).—Power, 16/2.5; accts., R. M. C. A.  
 EL SALVADOR.—Fy., add 5,525 (54.3).  
 EL SIGLO.—Power, 28/6.  
 ELTON HOYT II.—Type, add A1; accts., R. M. C. A.  
 EUGENE V. R. THAYER.—Power, 19/7.  
 EMIDIO.—Type, add A2; fy. add 425 (705).  
 E. T. BEDFORD.—Type, strike out A1; fy., add 400 (750).  
 ETHAN ALLEN.—Fy., strike out 410 (730), 454 (660).  
 EXARCH.—Power, 24/10 and 12.  
 EXCELLO.—Power, 24/12.  
 FALCON.—Type, add A1.  
 FAVORITE (KIFD).—Power, 13/15 and 6.  
 FAVORITE (KIFG).—Accts., R. M. C. A.  
 FAYETTE BROWN.—Type, add A1; accts., R. M. C. A.  
 FIRMORE.—Type, add A1.  
 FOAM.—Power, 15/6.  
 FONTANA.—Power, 13/6.  
 FORBES HAUPTMAN.—Fy., add 454 (660); power, 23/14.  
 FORTUNA (KDWU).—Type, strike out A3.  
 F. Q. BARSTOW.—Type, add A1.  
 FRANK LYNCH.—Fy., add 454 (660).  
 FREDERIC EWING.—Type, add A1.  
 GENE CRAWLEY.—Type, add A1.  
 GEORGE G. HENRY.—Power, 26/8.  
 GEORGE W. BARNES.—Type, add A1.  
 GEORGE W. MEAD.—Accts., R. M. C. A.  
 GLADYS II.—Type, add A2.  
 GOLDEN SUN.—Fy., strike out 159 (1,885); accts., American-Hawaiian S. S. Co.  
 GRAHAM C. WOODRUFF.—Accts., R. M. C. A.  
 GREATER BUFFALO.—Type, add B; hours, add X; accts., R. M. C. A.  
 GREATER DETROIT.—Type, add B; hours, add X; accts., R. M. C. A.  
 GULFBREEZE.—Type, add A1.  
 GULFLIGHT.—Fy., add 468 (640).  
 GULFGEM.—Fy., add 468 (640).  
 GULFMAID.—Type, strike out A1; fy., add 468 (640).  
 GULFSTAR.—Fy., add 468 (640).  
 HAPPY DAYS.—Fy., add 8,290 (36.19), 8,450 (35.5), 11,050 (27.15), 11,230 (26.71), 13,240 (22.66), 16,660 (18).  
 HARRIET.—Accts., R. M. C. A.  
 HARRY COULBY.—Accts., R. M. C. A.  
 HARRY W. CROFT.—Accts., R. M. C. A.  
 HARVARD (WTBY).—Power, 15/4.  
 HARVEY H. BROWN.—Accts., R. M. C. A.  
 HAZEL ROBB.—Type, strike out A1.  
 HENRY G. DALTON.—Rates, Great Lakes service, 4¢ per word; accts., R. M. C. A.  
 HERON.—Fy., strike out 468 (640), add 400 (750).  
 HOLY CROSS.—Power, 15/5.  
 HOXBAR.—Fy., add 400 (750).  
 HULVER.—Service, strike out PG, add P.  
 HUMRICK.—Accts., R. M. C. A.  
 HURON (WBCC).—Service, PG; rates, Great Lakes service, 4¢ per word.

- ILLINOIS (WPCY).—Type, add A1; accts., R. M. C. A.  
INDIANA (KGRJ).—Type, A1, A2; fy., 3,118 (96.21), 5,525 (54.3), 5,555 (54), 8,330 (36.01); power, 12/1.5; service, PG; hours, X; rates, 4¢ per word; accts., R. M. C. A.  
IROQUOIS (KGF D).—Fy., strike out 157 (1,910), 159 (1,885); power, 29/8.  
ISOBEL WEEMS.—Power, 22/8.  
JANIDORE.—Power, 20/5; accts., R. M. C. A.  
JAPAN ARROW.—Type, add A1; power, 20/8.5.  
J. C. FITZSIMMONS.—Power, 15/12.  
J. E. SAVAGE.—Accts., R. M. C. A.  
J. M. DANZIGER.—Type, add A1.  
JOHN ANDERSON.—Accts., R. M. C. A.  
JOHN A. TOPPING.—Type, add A1; accts., R. M. C. A.  
JOHN F. CUSHING.—Type, add A1; power, 6/3.5; accts., R. M. C. A.  
JOHN MCCARTNEY KENNEDY.—Accts., R. M. C. A.  
JOHN W. BOARDMAN.—Service, PG; rates, Great Lakes service, 4 cents per word.  
J. M. DANZIGER.—Type, strike out A1  
JOHN WORTHINGTON.—Type, add A1.  
JOSEPH H. FRANTZ.—Type, add A1; accts., R. M. C. A.  
KINGFISHER.—Fy., strike out 468 (640), add 400 (750).  
LAGONDA.—Accts., R. M. C. A.  
LAKE ARLINE.—Accts., R. M. C. A.  
LAKE BENBOW.—Accts., R. M. C. A.  
LAKE GORIN.—Accts., R. M. C. A.  
LAKE ORMOC.—Fy., add 8,330 (36.01), 11,110 (27), 16,580 (18.094), 16,660 (18.007); accts., R. M. C. A.  
LA PERLA.—Type, strike out B; hours, strike out X, add N.  
LEBEC.—Type, add A2.  
LIEBRE.—Power, 26/10.  
LIGHTBURNE.—Power, 24/12.  
LIMON.—Hours, strike out X.  
LOUISIANA (KGRK).—Type, A1, A2; fy., 3,118 (96.21), 5,525 (54.3), 5,555 (54), 8,330 (36.01); power, 12/1.5; service, PG; hours, X; rates, 4 cents per word; accts., R. M. C. A.  
MAITLAND No. 1.—Accts., R. M. C. A.  
MAKUA.—Power, 13/14.  
MALACCA.—Type, strike out A1.  
MALOLO LIFEBOAT No. 1.—Fy., add 375 (800), 454 (660).  
MALOLO LIFEBOAT No. 2.—Fy., add 375 (800), 454 (660).  
MANITOU.—Accts., R. M. C. A.  
MANUKAI.—Hours, add N.  
MARJ III.—Fy., strike out 5,615 (53.42), add 5,555 (54); accts., R. M. C. A.  
MARQUETTE & BESSEMER No. 2.—Accts., R. M. C. A.  
MATSONIA.—Type, strike out A3.  
MAUI.—Type, strike out A3.  
MAZAMA.—Type, strike out A2; add B; fy., add 454 (660); power, 25/8; hours, add X.  
MEVANIA.—Fy., add 153 (1,960).  
MIAMI.—Type, strike out A2.  
MICHIGAN (KEGS).—Type, add A1; fy., add 5,555 (54), 11,110 (27), 16,860 (17.794).  
MISSOULA.—Fy., add 454 (660).  
MISSOURI (WQDK).—Accts., R. M. C. A.  
MOJAVE.—Type, add A2.  
MUNAMAR.—Fy., strike out 159 (1,885), add 468 (640).  
MUNARGO.—Fy., strike out 143 (2,100), 410 (730), 454 (660), add 400 (750), 468 (640).  
MUNCOVE.—Power, 12/8.  
MUNDELTA.—Power, 28/3.  
MUNRIO.—Type, add A1.  
MUSKETEER.—Type, A1; fy., 5,525 (54.3), 5,555 (54), 8,330 (36.01), 11,050 (27.15), 11,110 (27), 16,580 (18.094), 16,660 (18.007); power, 20/5.  
NAKEN.—Type, strike out A1; power, 13/2.  
NAKHODA.—Fy., strike out 410 (730).  
NASHABA.—Fy., add 159 (1,885).  
NORCO.—Type, strike out A1, A2, add B; fy., strike out 468 (640); power, 21/2.  
NORTH AMERICAN.—Accts., R. M. C. A.



- NORWOOD.—Hours, add N.  
 OAKLEY L. ALEXANDER.—Type, add A1.  
 OAKMAR.—Type, strike out B, add A1, A2.  
 OCTORARA.—Accts., R. M. C. A.  
 OHIO.—Type, A1, A2; fy., 3,118 (96.22), 5,525 (54.3), 5,555 (54), 8,330 (36.01); power, 12/1.5; service, PG; hours, X; rates, 4 cents per word; accounts, R. M. C. A.  
 OLIVE K.—Fy., strike out 400 (750), add 410 (730), 5,555 (54), 11,110 (27); power, 15/1.5 and 2.5.  
 ONEIDA.—Accts., R. M. C. A.  
 ONONDAGA.—Accts., R. M. C. A.  
 ORITANI.—Fy., add 400 (750).  
 ORIZABA.—Fy., add 468 (640); power, 31/8 and 18.  
 O. S. MCFARLAND.—Accts., R. M. C. A.  
 PACIFIC PINE.—Power, 30/16.  
 PACIFIC SUN.—Fy., add 159 (1,885); power, 22.86/10.  
 PENOBSCOT (KGQR).—Power, 20/4; accts., R. M. C. A.  
 PETREL.—Type, strike out A1.  
 PHILIP D. BLOCK.—Power, 17/10.  
 POLYBIUS.—Fy., add 454 (660).  
 PONCE.—Power, 24/12.  
 PRESIDENT PIERCE.—Fy., strike out 6,590 (45.52).  
 PRESIDENT TAFT.—Type, add A1.  
 PRINCETON (KDLU).—Type, strike out A1; power, 15/5.  
 PUEBLO.—Type, add A1.  
 PURITAN.—Accts., R. M. C. A.  
 RENE.—Fy., add 5,525 (54.3), 5,555 (54), 8,290 (36.19), 8,330 (36.01), 8,450 (35.5), 11,050 (27.15), 11,110 (27), 11,230 (26.71), 13,240 (22.66), 16,580 (18.094).  
 ROBERT E. HOPKINS.—Type, add A1.  
 ROBERT HOBSON.—Accts., R. M. C. A.  
 ROBIN ADAIR.—Power, M/amp. 29/8.  
 ROBIN GRAY.—Fy., add 454 (660); power, 23/9.  
 ROCHESTER.—Type, add A1.  
 R. W. STEWART.—Hours, add N.  
 SACCO.—Type, strike out A1.  
 SALMON KING.—Type, strike out A3; fy., strike out 2,320 (129.3).  
 SAMUEL L. FULLER.—Power, 26/8.  
 SAMUEL MATHER.—Accts., R. M. C. A.  
 SAMUEL MITCHELL.—Service, PG; rates, Great Lakes service 4 cents per word.  
 SAN ANSELMO.—Fy., add 410 (730); accts., Pacific-Atlantic S. S. Co.  
 SANTA TECLA.—Type, strike out B; add A2.  
 SARAMAR III.—Fy., add 500 (600); power, 16/7; accounts, R. M. C. A.  
 SAWOKLA.—Type, add A2; fy., strike out 151 (1,985); power 25/6.  
 S. B. WAY.—Accts., R. M. C. A.  
 SCHENECTADY.—Hours, add N.  
 SEABORN.—Fy., strike out 16,580 (18.094), 22,100 (13.575), add 425 (705), 8,450 (35.5).  
 SELMA CITY.—Power, 26.5/16.  
 SHENANGO (WJBD).—Accts., R. M. C. A.  
 SHOGUN.—Type A1, A2; fy., 143 (2,100), 151 (1,985), 153 (1,960), 157 (1,910), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 468 (640), 500 (600); power, 5/6; service, PG; service, X; rates, 8 cents per word.  
 S. M. SPALDING.—Fy., strike out 410 (730), 454 (660), add 400 (750).  
 SOLITAIRE.—Fy., add 157 (1,910).  
 SONORA.—Accts., R. M. C. A.  
 SOUTH AMERICAN.—Accts., R. M. C. A.  
 SOUTHERN CROSS.—Fy., add 8,290 (36.19), 5,555 (54).  
 S. T. CRAPO.—Service, PG; rates, Great Lakes service 4 cents per word.  
 STEEL CHEMIST.—Accts., R. M. C. A.; power, 10/9.  
 STEEL ELECTRICIAN.—Accts., R. M. C. A.  
 STEELMOTOR.—Accts., R. M. C. A.  
 STEELVENDOR.—Type, strike out B, add A2; accts., R. M. C. A.  
 SULTANA.—Accts., R. M. C. A.  
 SWIFTEAGLE.—Fy., strike out 454 (660); power, 28/8.  
 TEAL.—Fy., strike out 468 (640), add 400 (750); power, 15/3.

- TENNESSEE.—Type, A1, A2; fy., 3,118 (96.22), 5,525 (54.3), 5,555 (54), 8,330 (36.01); power, 12/1.5; service, PG; hours, X; rates, 8 cents per word; accts., R. M. C. A.  
 TERN.—Fy., strike out 400 (750), 468 (640).  
 THALIA.—Fy., strike out 500 (600); accts., R. M. C. A.  
 THE HARVESTER.—Accts., R. M. C. A.  
 THEO.—Power, 16/5; accts., R. M. C. A.  
 THOMAS BRITT.—Accts., R. M. C. A.  
 TIDEWATER.—Power, 23/15.  
 TIONESTA.—Accts., R. M. C. A.  
 T. J. WILLIAMS.—Fy., strike out 400 (750).  
 T. L. DUROCHER.—Accts., R. M. C. A.  
 TRUDIONE.—Type, A1, A2; fy., 151 (1,985), 153 (1,960), 157 (1,910), 160 (1,875), 375 (800), 400 (750), 425 (705), 468 (640), 500 (600); power, 22/10; service, PG; hours, X; rates, 8 cents per word; accts., R. M. C. A.  
 T. W. ROBINSON.—Fy., strike out 394 (760).  
 UTOWANA.—Power, 26/7.  
 VENEZUELA.—Fy., add 5,525 (54.3), 8,330 (36.01), 11,110 (27), 16,660 (18.007), 16,860 (17.794).  
 VENUS (WPBI).—Accts., R. M. C. A.  
 VINCENT.—Power, 26/14.  
 VIRGINIA SINCLAIR.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 468 (640), 500 (600); power, 27/10; service, PG; hours, X; rates, 8 cents per word; accts., R. M. C. A.  
 WALTER MILLER.—Fy., add 157 (1,910), 468 (640).  
 WATERTOWN.—Power, 26/12.  
 W. E. FITZGERALD.—Accts., R. M. C. A.  
 WELLHART.—Type, A1, A2; fy., 375 (800), 400 (750), 425 (705), 468 (640), 500 (600); power, 15/5.  
 WEST CAMPGAW.—Power, 23/14.  
 WEST CAWTHON.—Power, 26/20.  
 WEST CHATALA.—Fy., add 454 (660).  
 WEST CHESWALD.—Fy., add 454 (660).  
 WEST DURFEE.—Fy., add 454 (660).  
 WEST ELCASCO.—Fy., add 454 (660).  
 WESTERN OCEAN.—Type, strike out B, add A1, A2; accts., R. M. C. A.  
 WESTERN STATES.—Power, 10/7; accts., R. M. C. A.  
 WESTERN WORLD.—Fy., strike out 157 (1,910), 159 (1,885).  
 WEST HARSHAW.—Fy., add 454 (660).  
 WEST HEMATITE.—Fy., add 454 (660).  
 WEST HIKA.—Fy., add 454 (660).  
 WEST HONAKER.—Type, add A2; fy., strike out 355 (845); power, 23/9; hours, add N.  
 WEST IRA.—Fy., add 454 (660); accts., R. M. C. A.  
 WEST IVIS.—Fy., strike out 454 (660).  
 WEST KYSKA.—Fy., add 454 (660).  
 WEST MADAKET.—Fy., add 454 (660).  
 WEST MAXIMUS.—Fy., add 454 (660).  
 WEST SELENE.—Power, 24/16.  
 WEST TACOOK.—Fy., add 454 (660).  
 WEST TOTANT.—Fy., add 454 (660).  
 WEST ZEDA.—Fy., add 454 (660).  
 W. F. WHITE.—Fy., strike out 500 (600).  
 WHITE STAR.—Type, A1, A2; fy., 5,525 (54.3), 5,555 (54), 8,330 (36.01), 11,050 (27.15), 11,110 (27), 16,580 (18.094), 16,660 (18.007); power, 20/5.  
 W. H. TILFORD.—Power, 24.6/8.  
 WILD GOOSE.—Fy., strike out 468 (640).  
 WILLIAM C. ATWATER (WDDL).—Power, 20/10.  
 WILLIAM G. MATHER.—Fy., strike out 394 (760), 151 (1,985), 153 (1,960), 155 (1,935); power, 15/8.  
 WILLIAM McLAUCHLAN.—Accts., R. M. C. A.  
 WILLIAM NELSON.—Accts., R. M. C. A.  
 WILLIAM PENN.—Type, add A2.  
 WILLIAM P. SNYDER, JR.—Accts., R. M. C. A.  
 WINONA COUNTY.—Power, 24/13; hours, strike out N.  
 W. L. CONNELLY.—Power, 26/8.  
 WM. A. LYDON.—Accts., R. M. C. A.

- WM. G. WARDEN.—Fy., add 410 (730).  
 W. M. IRISH.—Power, 19/7.  
 W. S. RHEEM.—Type, strike out A1.  
 WYANDOTTE.—Service, PG; rates, Great Lakes Service 4 cents per word.  
 YANKEE.—Power, 15/4.  
 YARMOUTH.—Fy., strike out 157 (1,910).  
 YOMACHICHI.—Type, add A2.  
 YOREDA.—Type, A2; fy., 375 (800), 394 (760), 410 (730), 425 (705), 500 (600); power, 7/7.  
 YOUNGSTOWN (WPBH).—Fy., add 425 (705); accts., R. M. C. A.  
 ZACAPA.—Fy., add 468 (640).  
 ZELDA.—Fy., add 400 (750), 468 (640); power, 15/5.  
 Strike out all particulars of the following-named station; Albatross (KELD)

## 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, 1930, and to the International List of Aircraft Stations, published by the Berne bureau]

- NC-223M.—Type, A3; fy., 3,106 (96.59), 3,172 (94.57), 5,660 (53).  
 NC-667M.—Type, A1; fy., 333 (900), 414 (725), 500 (600), 3,070 (97.71), 5,690 (52.72), 8,650 (34.68).  
 NC-670M.—Type, A1; fy., 333 (900), 414 (725), 500 (600), 3,070 (97.71), 5,690 (52.72), 8,650 (34.68).  
 NC-830M.—Fy., add 3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178 (94.39), 5,570 (53.86), 5,660 (53).  
 NC-831M.—Fy., add 3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178 (94.39), 5,570 (53.86), 5,660 (53).  
 NC-832M.—Fy., add 3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178 (94.39), 5,570 (53.86), 5,660 (53).  
 NC-833M.—Fy., add 3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178 (94.39), 5,570 (53.86), 5,660 (53).  
 NC-10338.—Fy., add 3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178 (94.39), 5,570 (53.86), 5,660 (53).  
 NC-10340.—Fy., add 3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178 (94.39), 5,570 (53.86), 5,660 (53).  
 NC-10341.—Fy., add 3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178 (94.39), 5,570 (53.86), 5,660 (53).  
 No. 117.—Type, A3; fy., 3,070 (97.71), 3,076 (97.5), 3,106 (96.59), 5,540 (54.15).  
 No. 121.—Type, A3; fy., 3,070 (97.71), 3,076 (97.5), 3,106 (96.59), 5,540 (54.15).  
 No. 400.—Type, A3; fy., 3,070 (97.71), 3,076 (97.5), 3,082 (97.33), 3,088 (97.15), 3,106 (96.59), 5,510 (54.44), 5,540 (54.15).  
 Strike out all particulars of the following-named stations: City of Glendale, City of New York, City of Tacoma, F-108, NC-196H, NC-813H, NC-8022, NC-8043, NC-9703, Washington, X-118E, Yankee Doodle.

## GOVERNMENT LAND STATIONS, ALPHABETICALLY, BY NAMES OF STATIONS

[Alterations and corrections to be made to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1930, and to the International List of Fixed and Land Stations, published by the Berne bureau]

- BELLEFONTE, PA.—Fy., strike out 302 (995), add 284 (1,055).  
 BOSTON, MASS. (WSX).—Fy., strike out 254 (1,180), add 266 (1,130).  
 EUREKA, CALIF., radio.—Transmits on 108 kc. (2,776 m.) time signals 1655 to 1700 and weather and hydrographic warnings 0018, 0433, 0818, 1218, 1633, and 2018 G. C. T.  
 KEY WEST, FLA. (WBP).—Strike out 284 (1,055), add 338 (890).  
 LA CROSSE, WIS.—Fy., strike out 338 (890), add 254 (1,180).  
 NAHANT, MASS.—Name changed to Winthrop, Mass.  
 OAKLAND, CALIF. (KCV).—Fy., strike out 326 (920), add 332 (905).  
 PASCO, WASH.—Fy., strike out 314 (955), add 320 (940).  
 PENSACOLA, FLA.—Transmits on 113 kcs. (2,653 m.) weather 1548 to 2303 G. C. T.  
 PHILADELPHIA, PA.—Transmits on 104 kcs. (2,885 m.) weather and hydrographic warnings 1545 to 2200 G. C. T.  
 PORTSMOUTH, VA. (fifth district U. S. N. R.).—Name changed to Norfolk, Va. (fifth district U. S. N. R.).

- SAN FRANCISCO, CALIF. (Mare Island).**—Transmits on 108 kcs. (2,776 m.) weather reports at 1600. Transmits on 8,590 (34.90) aviation weather at 0215 and 1415 and marine weather and hydrographic warnings at 0330 and 1530 G. C. T. No longer transmits time signals 0555 to 0600 and 1955 to 2000 G. C. T.
- SAN JUAN, P. R., radio (Cayey).**—Fy., strike out 48 (6246); transmits Caribbean weather July 1, to November 15, 0045, 0400, 1600 G. C. T.; add 33.8 (8,875). Hurricane warnings when received transmitted each even hour for 12 hours; transmits on 113 kcs. (2,653 m.) local weather 0400 to 1600 G. C. T.
- SAULT STE. MARIE, MICH.**—Call changed to NML.
- SILVER HILL, MD. (Washington, D. C.).**—Fy., strike out 266 (1,130), add 272 (1,100).
- WASHINGTON, D. C. (Annapolis, Md.).**—Fy., add 8,030 (37.34); transmits time signals 0255 to 0300, 0755 to 0800 and 12,045 (24.9); transmits time signals 1655 to 1700 G. C. T.
- WASHINGTON, D. C. (Arlington, Va.).**—Fy., transmits on 690 (434.5) time signals 1655 to 1700 and 0255 to 0300 G. C. T., strike out 12,045 (24.9); 4,015 kcs. (74.72 m.), no longer transmits weather at Europe to 1600 G. C. T.; add 8,870 (33.82) transmits time signals 1655 to 1700 and 13,305 kc. (22.54 m.) transmits time signals 0255 to 0300 and also aviation weather at 1305 G. C. T. Transmits on 16,060 kc. (18.67 m.) time signals 1655 to 1700; weather broadcast to Europe at 1600 and marine weather at 1500 G. C. T. No longer transmits marine weather 0300, 1500, and weather broadcast to Europe 0400, 1600 G. C. T. on this frequency.
- WASHINGTON, D. C. (Navy Yard).**—Transmits on 690 (434.5) weather 0300, 1510, and 2045 G. C. T.
- WICHITA, KANS.**—Fy., strike out 320 (940), add 332 (905).
- WINNETKA, ILL. (ninth district U. S. N. R.).**—Name changed to Chicago, Ill. (ninth district U. S. N. R.)
- Strike out all particulars of the following-named stations: Block Island, R. I.; Curtis Bay, Md.; New London, Conn. (C. G. Academy); Unalaska, Alaska.

#### 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, 1930, and to the International List of Ship Stations, published by the Berne bureau]

**HENRY COUNTY.**—Name changed to California State.

V-1.—Name changed to Barracuda.

V-2.—Name changed to Bass.

V-3.—Name changed to Bonita.

V-4.—Name changed to Argonaut.

V-5.—Name changed to Narwhal.

V-6.—Name changed to Nautilus.

V-7.—Name changed to Dolphin.

V-8.—Name changed to Cachalot.

V-9.—Name changed to Cuttlefish.

Strike out all particulars of the following-named vessels: Algonquin; Florence; Hamilton, Alexander; Hudson; Mackinac; Patrol; Virginia I; Wissahickon.

#### 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, 1930, and to the International List of Stations Performing Special Services, published by the Berne bureau]

**CAPE COD LIGHT STATION, MASS.**—Fy., 284 (1,055).

**VINEYARD SOUND LIGHTSHIP, MASS.**—Hours, strike out Operator stands watch first fifteen minutes of each hour from 8 a. m. to 9.15 p. m. in clear weather.

**DRY TORTUGAS LIGHT STATION, FLA.**—Hours, operates continuously during thick or foggy weather and daily in clear weather for the first 15 minutes of each hour.

**SAVANNAH LIGHTSHIP, GA.**—Hours, operates continuously during thick or foggy weather and daily in clear weather for the first 15 minutes of each hour.

**LOS ANGELES HARBOR LIGHT STATION, CALIF.**—Fy., 304 (987); hours, operates continuously during thick or foggy weather from 0 to 5, 15 to 20, 30 to 35, and from 45 to 50 minutes past each hour, and daily in clear weather from 0 to 5, and from 30 to 35 minutes past each hour.

*Commercial and Government land, ship, aircraft, radiobeacon and radiocompass stations, alphabetically, by call signals*

KAF, read Tilik, P. I. radio (Mindoro); KAJ, read Larena, P. I. radio; KAK, read Coron, P. I. radio (Palawan); KAL, read Legaspi, P. I. radio (Albay); KAM, read Pasay, P. I. (Rizal); KBC, read Bacuit, P. I. radio (Palawan); KBP, read Pandan, P. I. radio (Albay); KBT, read Butuan, P. I. radio (Agusan); KBZ, read Zumarraga, P. I. radio (Samar); KEH, read Marland Camp, Tex. (Borger); KEV, read Cagayan, P. I. radio (Sulu); KIW, read Zamboanga, P. I. radio (Zamboanga); KPX, read Lebak, P. I. radio (Cotabato); KPY, read San Francisco, P. I. radio (Cebu); KTS, read Tolong, P. I. (Oriental Negros); KUM, read Mambajao, P. I. radio (Oriental Misamis); KUZ, read Manila, P. I. (KUZ); KYU, read Burkburnett, Tex.; KZFJ, read Camiguin, P. I. (Cagayan); KZFL, read Milbuk, P. I. (Occidental Negros); KZFN, read Sipaco, P. I. (Camarines Sur); KZFT, read Naga-Naga, P. I. (Zamboanga); KZFV, read Sumagi, P. I. (Mindoro); NDK, read Norfolk, Va. (fifth district U. S. N. R.); NDS, read Chicago, Ill. (ninth district U. S. N. R.); NICQ, read Barracuda; NICR, read Bass; NICS, read Bonita; NICT, read Argonaut; NICV, read Narwhal; NICK, read Nautilus; NICZ, read Dolphin, NIDD, read Cachalot; NIDJ, read Cuttlefish; NIJB, read California State; NMF, read Winthrop, Mass.; NOZ, call changed to NML; WCK, read Detroit, Mich. (Belle Isle); WNAM, read Lewisburg, Pa. (near); WNAO, read Plainfield, N. J. (near); strike out all particulars following the call signals: KDE KELD, KGJA, KGJC, KGJD, KGJH, KGNG, KGNH, KGNU, KGNJ, KGOH, KGOL, KGOY, KGQY, KGVA, KGVV, KGVC, KGVD, KGVE, KGVE, KGVG, KGVH, KGVV, KGVJ, KGVK, KHARI, KHCEV, KHEBY, KHEDW, KHEFU, KHEIR, KHFJQ, KHGAZ, KHGBY, KHIMN, KHIWD, KHKTG, NMD, NOD, NON, NOY, NRCA, NRCH, NRKF, NRKH, NRKL, NRKM, NRKO, NRKQ, WBY. WGD, WGW, WHQ, WHU, WHV, WIO, WKK, WNDA, WQDT.

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, 1930, and the International List of Broadcasting Stations, published by the Berne bureau]

KFKB (Milford, Kans.).—Licensee, Farmers and Bankers Life Insurance Co.  
 KGEZ (Kalispell, Mont.).—Licensee, Treloar-Church Broadcasting Co. (Donald C. Treloar and Stanley R. Church).  
 KGNF (North Platte, Nebr.).—Licensee, Great Plains Broadcasting Co. (Inc.)  
 KMO (Tacoma, Wash.).—Loc. (approximate), 122° 25' 15" W., 47° 15' 00" N.  
 KUJ (Longview, Wash.).—Loc. (approximate), changed to Walla Walla, Wash., 118° 20' 00" W., 46° 02' 00" N.; post-office address, Marcus Whitman Hotel; fy., 1,370 (219).  
 KZRC (Cebu, P. I.).—Loc. (approximate), 124° 10' 00" E., 10° 08' 00" N.; fy., 937.5 (320); power, strike out.  
 KZRM (Manila, P. I.).—Loc. 121° 03' 15" E., 14° 37' 15" N.; fy., 618 (485), 6,140 (48.86, 9,570 (31.35), 11,830 (25.36)); power, strike out.  
 WAAM (Newark, N. J.).—Power, 1,000 night, 2,500 day.  
 WABZ (New Orleans, La.).—Licensee, Samuel D. Reeks.  
 WCLB (Long Beach, N. Y.).—Call changed to WMIL.  
 WDAG (Amarillo, Tex.).—Power, 1,000.  
 WFAN (Philadelphia, Pa.).—Loc., 75° 09' 56" W., 39° 57' 00" N.; post-office address, Ninth and Market Sts.  
 WFBL (Syracuse, N. Y.).—Loc. changed to Collamer, N. Y. (near), 76° 05' 11" W., 43° 05' 27" N.; power, 1,000 night, 2,500 day.  
 WGBS (Astoria, N. Y.).—Fy., 1,180 (254.2); power, 500.  
 WICC (Easton, Conn.).—Fy., 600 (500); power, 250.  
 WJAS (Pittsburgh, Pa.).—Power, 1,000 night, 2,500 day.  
 WLEX (Lexington, Mass.).—Licensee, Bay State Broadcasting Corporation.  
 WMC (Bartlett, Tenn.).—Licensee, Paul Dillard and Enoch Brown, jr., receivers.  
 WMMN (Fairmont, W. Va.).—Licensee, Holt-Rowe Broadcasting Co.  
 WRAK (Williamsport, Pa.).—Loc., (approximate), 77° 03' 00" W., 41° 14' 00" N.  
 WRAW (Reading, Pa.).—Power, 100.  
 WRDW (Augusta, Ga.).—Licensee, Musicove (Inc.).  
 WSMB (New Orleans, La.).—Loc. (approximate), 90° 00' 00" W., 29° 58' 05" N.

WTBO (Cumberland, Md.).—Power, 100 night, 250 day.  
Strike out all particulars of the following-named station: WMBJ (Wilkinsburg, Pa.).

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, 1930]

CALIFORNIA:

Alameda (W6XL).—Strike out all particulars.

San Francisco (W6XZ).—Strike out all particulars.

San Mateo County (W6XAA).—Strike out all particulars.

FLORIDA: Miami Beach (W4XQ).—Strike out all particulars.

HAWAII: Honolulu (K6XP).—Strike out all particulars.

ILLINOIS: Rantoul (W9XK).—Strike out all particulars.

MASSACHUSETTS: East Springfield (W1XAK).—Loc. changed to Chicopee Falls, Mass.

MINNESOTA: Anoka (W9XL).—Strike out all particulars.

NEW JERSEY:

Deal (W2XJ).—Loc. changed to Ocean Township, N. J.

Holmdel (W2XM).—Fy., strike out 100,000 (3), add 25,700 (11.673), 26,000 (11.538), 27,100 (11.070), 34,600 (8.67), 41,000 (7.31), 51,400 (5.83), 400,000 (.75) and above 401,000 (.74).

Ocean (W2XG).—Fy., add 23,100 (12.987), 25,700 (11.673), 26,000 (11.538), 27,100 (11.070), 34,600 (8.67), 41,000 (7.31), 51,400 (5.83), 60,000 (5) to 400,000 (.75) and above 401,000 (.74).

Whippany (W3XN).—Fy., add 23,100 (12.987).

Whippany (W3XP).—Fy., add 3,106 (96.58), 5,510 (54.44).

NEW YORK:

New York (W2XCT).—Strike out all particulars.

Rochester (W8XAC).—Strike out all particulars.

South Schenectady (W2XCN).—Strike out all particulars.

Winfield (W2XP).—Strike out all particulars.

OHIO: Cleveland (W8XF).—Strike out all particulars.

PENNSYLVANIA: East Pittsburgh (W8XI).—Fy., strike out, 31,000 (9.68), 51,000 (5.882), 59,000 (5.085), 60,000 (5) to 300,000 (1), add 23,100 (12.987), 25,700 (11.673), 26,100 (11.538), 27,100 (11.070), 34,600 (8.67), 51,400 (5.83), 60,000 (5) to 400,000 (.75), 401,000 (.74) and above.

UTAH: Salt Lake City (W6XA).—Strike out all particulars.

WISCONSIN:

Lake (W9XAS).—Strike out all particulars.

Madison (W9XH).—Strike out all particulars.

*Portable*

CALIFORNIA:

Los Angeles (W6XBR).—Strike out all particulars.

Oakland (W6XG).—Licensee, National Broadcasting Co. (Inc.).

ILLINOIS: Chicago (W9XAK).—Strike out all particulars.

MASSACHUSETTS: Millis (W1XK).—Strike out all particulars.

NEW JERSEY:

New Jersey (W2XDE).—Fy., add 3,106 (96.58).

Ocean Township (W2XAV).—Fy., strike out 1,860 (161.3).

NEW YORK: New York (W2XAA).—Loc. changed to New Jersey (portable); fy., add 25,700 (11.673), 26,000 (11.538), 27,100 (11.070), 34,600 (8.67), 41,000 (7.31), 51,400 (5.83), 60,000 (5) to 400,000 (.75) and above 401,000 (.74).

PENNSYLVANIA: Philadelphia (W3XAE).—Strike out all particulars.

UTAH: Salt Lake City (W6XR).—Strike out all particulars.

UNITED STATES—throughout (W10XAH).—Strike out all particulars.

*Aircraft*

NC-179N (W10XAG).—Strike out all particulars.

NC-952V (W2XBX).—Fy., add 1,608 (186.57), 2,302 (130.82), 3,076 (97.53), 4,108 (73.02), 5,510 (54.44), 6,155 (48.74).

NC-1592 (W10XN).—Strike out all particulars.

NC-9745 (W10XQ).—Strike out all particulars.

NR-487H (W2XBQ).—Strike out all particulars.

C-8376 (Unnamed) (W10XR).—Strike out all particulars.

X118E. (W2XAQ).—Strike out all particulars.

Vessels

Vessel (W10XK).—Fy., strike out 6,635 (45.21), 8,200 (36.59), 8,900 (33.71), 11,230 (26.71), add 2,730 (109.9), 3,127.5 (95.9), 4,177.5 (71.8), 4,430 (67.72), 8,830 (33.98), 8,860 (33.86), 12,380 (24.23), 13,260 (22.62), 16,440 (18.248), 17,640 (17.007)

VISUAL BROADCASTING STATIONS BY NAMES OF STATIONS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1930]

Aircraft

Unnamed (W10XU).—Strike out all particulars.

MISCELLANEOUS

CHANGES IN THE LIST OF VESSELS EQUIPPED WITH A RADIO COMPASS

The following-named vessels are additions to the lists published in Commercial and Government Radio Stations of the United States, edition June 30, 1930, and the International List of Ships Stations published by the Berne bureau:

Name	Call signal	Owner
COMMERCIAL		
Aras.....	WBED	Hugh J. Chisholm.
Harry F. Sinclair, jr.....	KGOK	Sinclair Nav. Co.
Huron.....	WADQ	Clyde S. S. Co.
Robert E. Hopkins.....	KDVE	Tide Water Oil Co.
Washington.....	KDCB	Texas Co.
Watertown.....	KING	Cities Service Transportation Co.

NOTE.—The radio compass has been removed from the Nevada, Washington (KIRF).

GENERAL ORDERS OF THE FEDERAL RADIO COMMISSION

Marine stations required to keep a log of their transmissions on distress frequencies, time of arrival and departure, and position (General Order No. 104, February 2, 1931).—It is ordered: (1) All ship stations, coastal stations, and stations licensed for marine relay service, shall maintain an accurate log of their operation on the international calling and distress frequency, 500 kilocycles (410 kilocycles on the Great Lakes) as follows:

(a) At stations where continuous watch is maintained, an entry shall be made at least every 15 minutes. At stations having limited hours of operation, similar entry shall be made during the time the station is active. All calls or answers made shall be entered, giving time and call letters of station worked. Stations may be designated by their call letters in all log entries.

(b) Entry shall be made of any unlawful interference from other stations.

(c) Distress calls and any unusual and special incidents shall be duly entered.

(d) Notations shall be made of any breakdowns of apparatus, failure of power supply, noises or disturbances tending to delay traffic.

(e) When a change in the watch is made the operator relieved shall sign his name with the indication "off watch" and the relieving operator shall sign his name showing that he is "on watch."

(f) Each sheet of the log shall be numbered and dated. The time used for making an entry in the radio log shall be stated at the top of each sheet; that is, Greenwich mean time, seventy-fifth meridian time, or whatever time is used, depending upon the location of the station.

(2) In addition, ship stations shall show the following:

(a) Time of arrival at and departure from ports, giving names of each.

(b) Approximate position of vessel showing miles and direction from some given point each day. Latitude and longitude may be used (noon position is preferred).

(3) These logs shall be available to inspection by Government radio inspectors in the course of their official duties, and information therein contained shall be

held confidential by said inspectors except as may become necessary in the discharge of their official duties.

This order shall be effective on March 1, 1931.

*Broadcasting day defined; test or experimental period defined; regulations regarding sharing time, limited time, and day time stations; regulation governing reduction of power after sunset and regulation governing hours of operation of part-time stations (General Order No. 105, February 12, 1931.—Section 1. The broadcasting day.*—That period of time between 6 o'clock a. m., and 12 o'clock midnight shall constitute a broadcasting day; the period between 6 o'clock a. m. and local sunset to be designated as daytime and that between local sunset and 12 o'clock midnight as nighttime. The monthly average sunset at all locations will be specified by the Federal Radio Commission and the references herein made to times shall be taken as referring to local standard time unless otherwise ordered. In determining the quota value of a given assignment or in the computation of time division the average time of local sunset shall be taken to be 6 o'clock p. m., and one hour of nighttime operation shall be considered as the equivalent of two hours of daytime operation.

*Section 2. The test or experimental period.*—That period of time between 12 o'clock midnight and 6 o'clock a. m., local time, shall constitute the test or experimental period and may be used for this purpose by any regularly licensed broadcasting station on its assigned frequency and with its authorized power: *Provided, however,* That no interference is caused with other stations maintaining a regular operating schedule during all or any part of said time.

*Section 3. Unlimited time stations.*—All broadcasting stations now or hereinafter licensed to operate without limit as to time may operate on any schedule of hours that meets their requirements whether during the broadcasting day or test or experimental period: *Provided, however,* That from and after the 1st day of May, 1931, no licenses authorizing unlimited hours of operation will be issued to broadcasting stations which are not on said date and do not continuously thereafter maintain a minimum regular operating schedule of 12 hours per broadcasting day; at least 3 hours of which shall be between 6 o'clock p. m. and 12 o'clock midnight local time. In all cases where the minimum regular operating schedule herein provided is not adhered to, such stations may after hearing be required to share time with other stations or be reduced to part-time stations.

*Section 4. Stations sharing time.*—(a) In all cases where broadcasting stations are licensed to share time they shall not operate simultaneously at any time, either day or night, unless specifically authorized to do so by the terms of their licenses.

(b) In all cases where broadcasting stations are licensed to share time and specified hours of operation are designated in the license, that schedule shall be adhered to until otherwise ordered by the commission or deviation therefrom is permitted pursuant to paragraph (d) of this section.

(c) In all cases where broadcasting stations are required to share time and the specific hours of operation are not designated in the license, the licensees of such stations shall endeavor to reach an agreement as to a definite schedule of periods of time to be used by each of them, and if successful each of said stations shall reduce said agreement to writing and file the same in triplicate with the commission with each application for renewal of license. If and when such written agreements are properly filed in conformity with this order, the file mark of the commission shall be affixed thereto, one copy shall be retained by the commission, one copy shall be forwarded to the Radio Division of the Department of Commerce, and one copy shall be returned to the licensee of said station to be posted with its license and considered as a part thereof. If the license specifies a definite proportionate time division the agreement shall maintain this proportion. In cases no proportionate time division is specified, the stations will agree upon a division of time. Nothing contained in this order shall be construed as authorizing or permitting the simultaneous operation of such stations unless specifically authorized to do so by the terms of their licenses.

(d) In all cases enumerated in paragraphs (b) and (c) hereof, departure from the regular operating schedule will be permitted only in cases where an agreement to that effect is reduced to writing, signed by the stations affected thereby, and filed in triplicate with the commission prior to the time of said departure: *Provided, however,* That in cases where time is of the essence, the actual departure in the operating schedule may, after appropriate notice to the commission and to the Radio Division of the Department of Commerce, precede the actual filing of the written agreement with the commission: *Provided further,* That nothing



herein contained shall be taken as authorizing any simultaneous operation not specifically authorized in the licenses of the stations affected.

(e) In all cases enumerated in paragraph (c) hereof where the station licensee are unable to reach an agreement as to a definite schedule of periods of time to be used by each of them, the commission shall be so notified by the filing of a statement to that effect with the application for renewal of license. Upon receipt of such statement the commission will designate the applications for hearing and pending such hearing the operating schedule previously adhered to shall remain in full force and effect.

*Section 5. Limited time and day stations.*—(a) In all cases where a broadcasting station is licensed to operate limited time or during daytime it shall not operate simultaneously with any other station assigned to that frequency at any time unless specifically authorized to do so by the terms of its license.

(b) In all cases where a broadcasting station is licensed to operate with limited hours and required to cease operation at the time of sunset at some point within the United States, the license will provide the hour of the day during each month of the license period when said station shall cease operation.

(c) In all cases where limited time stations are licensed to resume operation at the time the unlimited-time station on the same channel ceases operation, the licensee of said limited-time station shall file in triplicate with the commission a copy of its regular operating schedule, signed and approved by the licensee of the unlimited-time station. Upon receipt of such operating schedule, properly executed, the commission will affix its file mark, retain one copy, forward one copy to the Radio Division of the Department of Commerce, and return one copy to the licensee of the limited-time station filing the same who shall cause it to be posted with and considered as a part of the station license. Departure from said operating schedule may be had only by compliance with the provisions of paragraph (d) of section 4 with respect to such departures by stations sharing time.

*Section 6. Reducing power at sunset.*—In all cases where a broadcasting station is licensed to operate with more power during daytime operation than for nighttime operation and the licensee is required to reduce the power of the station at the time of sunset, the license issued to said station will specify the hour of the day during each month of the license period at which said station is required to reduce its power.

*Section 7. Part-time stations.*—Any broadcasting station other than a day or a limited-time station which is licensed to operate part time on a channel where the entire available broadcasting time—that is, the broadcasting day—has not been designated for the use of any other station or stations, may operate temporarily and until the further order of the commission upon all or any part of the time not so designated: *Provided, however,* That where two or more part-time stations are eligible to operate on said undesignated time, they shall comply with the provisions of paragraph (c) of section 4 with respect to the regular operating schedule of stations sharing time.

*Section 8. Violations.*—(a) In all cases where a licensee is required by the terms of this order to file any document pertaining to its operating schedule at the time of its application for a license, the failure to file such a document shall be considered as a defect in the application for license within the meaning of section 1 of subtitle B of Practice and Procedure Before the Federal Radio Commission adopted by General Order No. 93.

(b) In all cases where a station licensee is required to prepare and file a regular operating schedule, any deviation or departure from such schedule, except as herein authorized, shall be considered as a violation of a material term of the license and of this order.

(c) In all cases where the specific hours of operation are fixed in the license, any deviation or departure therefrom, except as herein authorized, shall be considered as a violation of a material term of the license and of this order.

(d) Unless specifically authorized to do so by the terms of their licenses, no stations operating on the same frequency assignments shall be permitted to operate simultaneously. Any unauthorized simultaneous operation shall be considered as a violation of a material term of the station license and of this order without regard to any understanding or agreement as between the stations affected thereby.

This order shall be effective on March 1, 1931.

*Amendment to General Order No. 105, March 2, 1931.*—It is ordered: The effective date of General Order No. 105 is hereby postponed until 3 a. m., eastern standard time, April 30, 1931.

*Broadcasting stations required to keep a program and operating log (General Order No. 106, February 16, 1931).*—It is ordered: That all broadcasting stations be and they hereby are required to maintain two logs, as follows:

1. *Program log.*—This log shall contain (a) an entry of all stations and call announcements and the time made; (b) an entry describing each program broadcast with the time beginning and ending. If phonograph records or electrical transcriptions are used that fact shall be noted, together with the announcement made thereof.

2. *Operating log.*—This log shall contain (a) an entry of the time the station's carrier wave goes on the air and the time the station's carrier wave is stopped; (b) an entry of the time the program begins and ends; (c) an entry of every interruption of the carrier wave, its cause, and duration; (d) an entry of each of the following shall be made every 30 minutes:

(1) Operating constants on last radio stage (total plate current and plate voltage), antenna current; (2) frequency check; (3) temperature of crystal chamber (if used).

These logs shall be kept by the person or persons competent to do so having actual knowledge or information of the facts herein required, who shall sign the log when coming on duty and again when going off duty. The logs herein required shall be open to inspection at all reasonable times by Government radio inspectors and other persons authorized to do so by the Federal Radio Commission.

This order shall be effective on the 1st day of March, 1931.

*Amendment to General Order No. 106, February 27, 1931.*—It is ordered: The effective date of General Order No. 106 is hereby postponed until 3 a. m., eastern standard time, April 30, 1931.

#### BROADCASTING STATION FREQUENCY MEASUREMENTS DURING DECEMBER, 1930

The Radio Division of the Department of Commerce, during the month of December, 1930, measured the frequency (kilocycles-wave lengths) of 339 broadcasting stations throughout the country in order to ascertain whether they were operating on their assigned frequency. These stations were measured for an aggregate of 7,469 times and, through these measurements, it was ascertained that 35 at no time deviated 100 cycles or over (one-tenth of a kilocycle) and 66 deviated less than 200 cycles (two-tenths of a kilocycle). It will be seen that, out of the 339 stations measured, 238 deviated 200 cycles or more.

The permissible tolerance from an assigned frequency is not more than 500 cycles. These frequency checks were made at various times during day and night throughout the month and are made with a view of remedying interference between stations.

A list of those deviating under 100 and 200 cycles follows:

#### UNDER 100 CYCLES

KDFM	Beaumont, Tex.	WGY	Schenectady, N. Y.	WMT	Waterloo, Iowa.
KFI	Los Angeles, Calif.	WHAD	Milwaukee, Wis.	WOI	Ames, Iowa.
KFJI	Astoria, Oreg.	WHB	Kansas City, Mo.	WOL	Washington, D. C.
KROW	Richmond, Calif.	WHDH	Gloucester, Mass.	WOR	Newark, N. J.
KTAR	Lincoln, Nebr.	WHFC	Cicero, Ill.	WQAM	Miami, Fla.
KUOA	Fayetteville, Ark.	WHP	Lemoyno, Pa.	WRO	Washington, D. C.
KVI	Des Moines, Iowa.	WIC	Easton, Conn.	WREC	Whitehaven, Tenn.
WDAG	Amarillo, Tex.	WJR	Sylvan Lake Village, Mich.	WRUF	Gainesville, Fla.
WDBJ	Roanoke, Va.	WKRC	Cincinnati, Ohio.	WSBC	Chicago, Ill.
WBCB	Superior, Wis.	WLBZ	Bangor, Me.	WSSH	Boston, Mass.
WEEI	Weymouth, Mass.	WMBC	Detroit, Mich.	WTAG	Worcester, Mass.
WGR	Amherst, N. Y.			WTMJ	Brookfield, Wis.

#### UNDER 200 CYCLES

KFKB	Milford, Kans.	KOIL	Council Bluffs, Iowa.	WBBM	Glenview, Ill.
KFNF	Shenandoah, Iowa.	KOMO	} Seattle, Wash.	WCFL	} Chicago, Ill.
KFPF	Greenville, Tex.	KPCB		WCRW	
KFRG	San Diego, Calif.	KPO	San Francisco, Calif.	WCSH	Portland, Me.
KGEF	Los Angeles, Calif.	KPOF	Denver, Colo. (West- minster).	WDGY	Minneapolis, Minn.
KGGF	Picher, Okla.			WEAF	Bellmore, N. Y.
KGIW	Trinidad, Colo.	KSD	St. Louis, Mo.	WEAN	Providence, R. I.
KGO	Oakland, Calif.	KSEI	Pocatello, Idaho.	WEAO	Columbus, Ohio.
KHJ	Los Angeles, Calif.	KWEA	Shreveport, La.	WFI	Philadelphia, Pa.
KLS	Oakland, Calif.	KWJJ	Portland, Oreg.	WGBF	Evansville, Ind.
KLZ	Denver, Colo.	WABC	New York, N. Y.	WGN	Elgin, Ill.
KMBC	Independence, Mo.	WBAK	Harrisburg, Pa.	WIBW	Topeka, Kans.
KMMJ	Clay Center, Nebr.	WBAL	Glen Morris, Md.	WIP	Philadelphia, Pa.

WJAX	Jacksonville, Fla.	WMC	Memphis, Tenn.	WPAP	} Cliffside, N. J.
WJZ	Bound Brook, N. J.	WMCA	Hoboken, N. J.	WQAO	
WKY	Oklahoma City, Okla.	WNAO	} Quincy, Mass.	WPCB	Hoboken, N. J.
WKZO	Berrien Springs, Mich.	WBIS		WRHM	Fridley, Minn.
WLBF	Kansas City, Kans.	WNAX	Yankton, S. Dak.	WSAR	Fall River, Mass.
WLEX	Lexington, Mass.	WNYC	New York, N. Y.	WSB	Atlanta, Ga.
WLIT	Philadelphia, Pa.	WODX	Springhill, Ala.	WSFA	Montgomery, Ala.
WLW	Mason, Ohio.	WOKO	Mount Beacon, N. Y.	WSM	Nashville, Tenn.
WMAL	Washington, D. C.	WOS	Jefferson City, Mo.	WSUI	Iowa City, Iowa.
WMBI	Addison, Ill.	WOW	Omaha, Nebr.	WWNC	Asheville, N. C.

As only 339 out of the 613 broadcasting stations in the United States and possessions were measured, it must be borne in mind that many of those not measured undoubtedly are as efficient as those named above.

A small, thin slab of quartz is the guiding hand which keeps the modern broadcasting station upon its assigned frequency. When associated with the proper apparatus, the quartz exhibits the remarkable phenomena of changing its thickness many thousands, even millions of times a second. It is this oscillatory motion that controls the frequency of the broadcasting station. The thickness of the quartz bears a definite relation to the frequency at which it will oscillate; consequently, a quartz crystal may be cut to oscillate at any frequency desired by making it of the correct thickness.

As is well known, heat causes an expansion and cold a contraction in solids, and so it is with a crystal. Since the frequency of the quartz depends upon its thickness, it is essential that the temperature of the quartz be kept constant at all times. Otherwise, the frequency will shift. Elaborate means are employed to keep the crystal at an even, unvarying temperature. Even so, it sometimes happens that the temperature of the crystal varies enough to change its frequency. By means of sensitive and precision measuring apparatus, any frequency shift is readily detected and measured.

STATIONS IN PERSIAN GULF CLOSED

Lingah and Lingah radio will close for all traffic on March 1.

## Number and class of radio stations of the world, 1913 to 1930

Fiscal year ending June 30 <sup>1</sup>	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	
UNITED STATES																			
Merchant ship	483	555	585	604	836	1,478	2,312	2,808	2,978	2,773	2,723	2,741	1,901	1,954	2,092	2,166	2,213	2,173	
Commercial transoceanic	1	7	7	7	5	5	5	6	6	12	12	12	20	22	26	85	101	165	
Commercial ship to shore (general public service)	44	49	58	59	7	7	7	17	28	35	45	53	69	61	69	65	77	112	
Commercial point to point and commercial (private) ship to shore (limited public and limited commercial service)	30	35	52	63	26	26	26	71	105	138	179	224	207	236	245	279	350	331	
Experimental, relay broadcasting and visual broadcasting	11	35	56	72	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	63	147	227	261	331	241	193	185	203	179	287	
Technical and training school	7	9	22	39	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	42	94	117	127	145	31	32	41	31	49	104	
Special amateur	4	9	40	72	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	59	142	181	178	289	182	32	41	31	49	( <sup>3</sup> )	
General and restricted amateur	1,224	2,796	3,805	4,870	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	5,922	10,809	15,504	16,570	15,545	14,928	14,902	15,926	16,928	16,829	18,994	
Government land (all classes)	77	94	104	118	( <sup>2</sup> )	( <sup>2</sup> )	269	262	227	200	290	298	305	325	333	400	360	387	
Government ship	229	291	317	324	( <sup>2</sup> )	( <sup>2</sup> )	1,580	1,312	1,158	1,194	1,003	951	1,218	1,155	1,216	1,216	1,211	1,161	
Broadcasting										382	573	535	571	528	694	691	614	612	
Aeronautical (land)																		789	
Commercial aircraft										2	6	1	1	3	1	8	97	215	
FOREIGN STATIONS																			
Commercial and Government land (all classes)	347	478	534	767	642	686	733	977	1,107	1,092	1,068	1,049	1,120	1,180	1,373	1,490	2,167	2,495	
Government ship	1,237	1,397	1,424	1,018	1,469	1,494	1,516	705	1,229	1,671	1,779	2,015	2,111	2,164	2,172	2,286	2,441	2,490	
Merchant ship	1,390	2,024	2,445	1,963	2,254	2,216	2,420	5,140	5,818	8,699	8,502	8,915	9,404	9,721	10,276	10,805	11,281	11,803	
Commercial aircraft															74	131	273	402	

<sup>1</sup> Figures for foreign stations are as of various dates during the years mentioned.

<sup>2</sup> In 1912 there were 367 American vessels equipped.

<sup>3</sup> War period, stations inoperative.

<sup>4</sup> Discontinued, combined with general and restricted amateur stations.

<sup>5</sup> No listing during war period.

<sup>6</sup> None in previous years.

<sup>7</sup> Included in commercial point-to-point for previous years.

<sup>8</sup> No previous record.

## A RADIO METHOD FOR SYNCHRONIZING RECORDING APPARATUS

In a paper of the above title by T. Parkinson and T. R. Gilliland, Research Paper No. 269, Bureau of Standards Journal of Research, February, 1931, a method is described for running two radio fading recorders at the same speed when it is necessary to have one of them portable. One recorder may be used at a fixed location and the other on a vehicle for tests at various places. Small synchronous motors were used to drive the recorders. The same 60-cycle source of power used to supply the motor at the control station modulated a radio transmitter, the signal of which was received at the portable station and amplified sufficiently to drive the synchronous motor there. The speed of the portable recorder was easily controlled at a distance of 16 kilometers with low power output from the transmitter. The paper gives a method for marking the two records simultaneously so that they can be superposed.

Reprint copies of this paper will be available within a few weeks and may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. The price will be quoted by that office on application.

## ACCURATE FREQUENCY TRANSMISSIONS ON 5,000 KILOCYCLES

In an announcement by the Bureau of Standards published at the beginning of the year appearing in several technical magazines and the newspapers, mention was made of the inauguration of an improved type of standard frequency transmission upon 5,000 kilocycles. These signals are transmitted from 1.30 to 3.30 and 8 to 10 p. m., eastern standard time, three Tuesdays in the month. They represent a step in the program of ultimately providing continuous transmissions of accurately known frequency available in all parts of the United States.

The transmitting set is in a temporary location at College Park, Md., 10 miles from the Bureau of Standards. The transmitted frequency is controlled by a standard piezo oscillator at the transmitter. Work has been begun on facilities for control of the transmissions by the primary frequency standard located at the bureau's main laboratory. As the transmitting station is not located adjacent to an experimental flying field, there are restrictions on the height at which an antenna may be built, and its location, with the result that the radiated power is now severely limited.

The power in the present antenna system, which is a horizontal dipole one-eighth wave length above the ground, is less than 200 watts. In spite of the limitations stated above, the signals have been utilized more than 2,000 miles away. This statement should not be construed as meaning that the transmissions are heard everywhere within a radius of 2,000 miles, because some reports from points a few hundred miles distant indicate that the reception there may not be reliable at the present times of transmission. Radio reception varies with the distance, time of day, season of the year, and frequency. It is likewise known to vary from year to year. A consideration of all of these elements affecting the transmission shows the magnitude of the problem of supplying universally available standard frequency service.

In working out the problem the bureau has asked for assistance from the many people engaged in radio work in various Government bureaus, the Army, the Navy, radio companies and measurement laboratories, and others. The bureau desires reports on the reception of these signals in various localities. The information desired includes time of reception, approximate field intensity, and degree of fading. The bureau appreciates the cooperation evidenced by the many reports which are being received, and which are helpful in the plans to improve the standard frequency service.

The accuracy of the 5,000-kilocycle transmissions is within 1 part in a million. Plans for the expansion of the service cover the following, which are being undertaken as rapidly as possible: Increase in power output, transmission on one or two additional higher frequencies, further increase in accuracy, and extension of time of transmissions.