DEPARTMENT OF COMMERCE

RADIO SERVICE BULLETIN

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CONTENTS

ABBREVIATIONS AND SYMBOLS

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

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

NEW STATIONS

Commercial land stations, alphabetically, by names of stations

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

Station	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Station controlled by—
Camiguin Island, P. I.	KUX				Camiguin Lumber Co.
Cebu, P. I.[1]	KTL	5,484 (54.7)	FX	N	Radio Corporation of the Philippines.
Iloilo. P. I.	KTJ	5,976 (50.2)	FX	N	Do.
Limay, P. I.	KUG		P		Cadwallader Gibson Lumber Co.
Mambajao, P. I.[2]	KUM	571.4 (525), 272.7 (1,100)	PG		Philippine Insular Government.
Manila, P. I.[3]	KTN	5,941 (50.5)	FX	N	Radio Corporation of the Philippines.
Manila, P. I.	KUE		P		Cadwallader Gibson Lumber Co.
Naga, P. I.	KUQ				Mindanao Lumber Co.
Sayville, N. Y.[4]	WML	7,670 (39.11), 7,730 (38.81), 8,990 (33.37) 14,740 (20.35), 14,770 (20.31), 19,580 (15.322), 19620 (15.291), 20,300 (14.778), 20.980 (14.299), 21,380 (14.032).	FX	N	Mackay Radio & Telegraph Co.
Sipaco, P. I.	KUF		P		Cadwallader Gibson Lumber Co.
Portable					
Louisiana[5]	WFH	1,600 (187.5), 1,652 (181.6), 1,664 (180.29), 1,680 (178.6), 1,704 (176.06).	FX	X	Geophysical Research Corporation.
Do	WFJ	do	FX	X	Do.
Do	WFQ	do	FX	X	Do.
Do	WFR	do	FX	X	
Do	WFS	do	FX	X	Do.
Do	WFG	do	FX	X	Do.
Louisiana, Mississippi and Texas:					
No. 1A[6]	WCH	do	FX	X	Texas Co.
No. 2A[6]	WBB	do	FX	X	Do.
No. 3A[6]	WBD	do	FX	X	Do.
No. 4A[6]	WBE	do	FX	X	Do.
No. 5A[6]	WBG	do	FX	X	Do.
No. 6A[6]	WBH	do	FX	X	Do.
No. 7A[6]	WBK	do	FX	X	Do.
No. 8A[6]	WBN	do	FX	X	Do.
No. 9A[6]	WBS	do	FX	X	Do.
No. 10A[6]	WBX	do	FX	X	Do.
No. 11A[6]	WCA	1,600 (187.5), 1,652 (181.6), 1,664 (180.29), 1,680 (178.6), 1,704 (176.06).	FX	X	Do.
No. 12A[6]	WCB	do	FX	X	Do.
No. 13A[6]	WCD	do	FX	X	Do.
Mississippi[5]	WFM	do	FX	X	Geophysical Research Corporation.
Do	WFN	do	FX	X	Do.
Do	WFP	do	FX	X	Do.
No. 1[7]	KMZ	do	FX	X	Humble Oil & Refining Co.
No. 2[7]	KMY	do	FX	X	Do.
No. 3[7]	KMX	do	FX	X	Do.
No. 4[7]	KMS	do	FX	X	Do.
No. 5[7]	KMI	do	FX	X	Do.
No. 6[6]	KJG	do	FX	X	Texas Co.
No. 6[7]	KMD	do	FX	X	Humble Oil & Refining Co.
No. 7[7]	KLY	do	FX	X	Do.
No. 8[7]	KLI	do	FX	X	Do.
No. 9[7]	KLG	do	FX	X	Do.
No. 10[7]	KLT	do	FX	X	Do.

[1] Loc., 124° 10′ 00″ E., 10° 08′ 00″ N. (approximately); type A1.
[2] Loc., 124° 42′ 50″ E., 9° 14′ 30″ N. (approximately); type, A1; hours, 8 a. m. to 12 noon, 2 to 5.30 p. m., daily; 9 to 11 a. m. and 2 to 3.30 p. m., Sundays and holidays; ship service 0.20 to 0.40 of each hour; rates, 6 cents per word.
[3] Loc., 121° 03′ 15″ E., 14° 37′ 15″ N. (approximately); type, A1.
[4] Loc., 73° 06′ 12″ W., 40° 44′ 36″ N.; type, A1 and A2.
[5] Type, A2.
[6] Type, A1.
[7] Type, A2 and A3.

Commercial land stations, alphabetically, by names of stations

Station	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Station controlled by—
No. 11 [7]	KLE	1,600; (187.5), 1,652, (181.6) 1,664, (180.29), 1,680 (178.6) 1,704, (176.06).	FX	X	Humble Oil & Refining Co.
No. 12 [7]	KLA	do	FX	X	Do.
No. 13 [7]	KFF	do	FX	X	Do.
No. 14 [7]	KFG	do	FX	X	Do.
No. 15 [7]	KFY	do	FX	X	Do.
No. 16 [7]	KGZ	do	FX	X	Do.
No. 17 [7]	KJA	do	FX	X	Do.
No. 18 [7]	KJD	do	FX	X	Do.
Oklahoma [5]	KNL	do	FX	X	Do.
Do	KNM	do	FX	X	Do.
Do	KNQ	do	FX	X	Do.
Do	KNY	do	FX	X	Do.
Do	KNZ	do	FX	X	Do.
Do	KOD	do	FX	X	Do.
Portable [6]	KJN	do	FX	X	Geophysical Exploration Co.
Do	KJO	do	FX	X	Do.
Do	KJT	do	FX	X	Do.
Do	KJW	do	FX	X	Do.
Do	KJY	do	FX	X	Do.
Do [7]	KJZ	do	FX	X	Marland Production Co.
Texas [5]	KNS	do	FX	X	Geophysical Research Corporation.
Do	KNT	do	FX	X	Do.
Do	KNU	do	FX	X	Do.
Do	KOF	do	FX	X	Do.
Do	KOI	do	FX	X	Do.
Do	KOT	do	FX	X	Do.
Texas and Louisiana. [8]	KOZ	1,600 (187.5), 1,652 (181.6), 1,664 (180.29), 1,680 (178.6).	FX	X	Interstate Geophysical Exploration Co.
Do	KPF	do	FX	X	Do.
Do	KPL	do	FX	X	Do.
Do	KPT	do	FX	X	Do.
Do	KPU	do	FX	X	Do.
Do	KRR	do	FX	X	Do.
Do	KRS	do	FX	X	Do.
Do	KRT	do	FX	X	Do.
Do	KRV	do	FX	X	Do.
Do	KRW	do	FX	X	Do.
Do	KRZ	do	FX	X	Do.
Do [7]	WCM	do	FX	X	Sun Oil Co.
Do	WCN	do	FX	X	Do.
Do	WCO	do	FX	X	Do.
Do	WCP	do	FX	X	Do.
Do	WCR	do	FX	X	Do.
Do [8]	WCS	do	FX	X	Interstate Geophysical Exploration Co.
Third zone [7]	WCU	do	FX	X	Marland Perduction Co.
Do [8]	WFY	do	FX	X	Geophysical Research Corporation.
Do	WFZ	do	FX	X	Do.
Do	WGB	do	FX	X	Do.

[5] Tape, A2. [6] Type, A1. [7] Type, A2 and A3. [8] Type, A1, A2, and A3.

Commercial ship stations, alphabetically, by names of vessels

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

Name of vessel	Call signal	Rates	Service	Hours	Owner of vessel	Message accounts settled by—[1]
Abacena [1]	WIDC		P	X	Stacy P. Bailey	Owner.
Blaine	WHDY				E. V. Rideout Co	Do.
Davao [2]	KZEC	4	PG		Mariano Cu Unjieng	Do.
Dominga-A [3]	KZEB	4	PG		do	Do.
Don Juan O [3]	KZCZ	4	PG		Rio y Olabarrieta	Do.
F. Escano [4]	KZES	4	PG		La Naviera Filipina, Inc.	Do.
Floridian	KJII	8	PG	X	Strachan's Southern S. S. Co	R. M. C. A.
Fortuna [3]	KZDV	4	PG		Rio y Olabarrieta	Owner.
Georgian	KJUA	8	PG	X	Strachan's Southern S. S. Co	R. M. C. A.
Halcyon [5]	WHDZ		P	X	E. V. Rideout Co	Owner.
Harbor [6]	WIDB		P	X	Harbor Tug & Barge Co	Do.
Helena [7]	WHDX		P	X	John J. Matheson	Do.
Idler [8]	WHDW		P	X	A. R. Pieper	Do.
Isidoro Pons [4]	KZDT	4	PG		Compania General de Tabacos de Filipinas.	Do.
Penguin [5]	WHDS		P	X	E. V. Rideout Co	Do.
Phantom [9]	WHDV		P	X	Thorne Donnelley	Do.
San Isidro [10]	KZCC	4	PG		Visayan Stevedore Transportation Co.	Do.
Santo Domingo [10]	KZDS	4	PG		do	Do.
Southern Traders [11]	KZET	4	PG		Southern Transport & Trading Co.	Do.
Toloa [12]	WHDR	8	PG	N	United Fruit Steamship Co	T. R. T. Co.
William J. O'Brien	WHDT	8	PG	X	R. O'Brien & Co	R. M. C. A.
Wm. A. Lydon [13]	KGCC		PG	X	Great Lakes Dredge & Dock Co	
Yusingco [14]	KZEH	4	PG		Pelagio Yu Singco	Owner.

[1] Type, A1; fy., 425 (705), 500 (600), 3,436 (87.3), 5,525 (54.3), 8,230 (36.45), 12,340 (24.31); power, 6 m. a.
[2] Type, B; fy., 500 (600), 400 (750); hours, 7 a. m. to 12 noon, 1 to 7 and 7.30 to 10.30 p. m.
[3] Type, A1 and A2; fy., 500 (600); hours, 8 a. m. to 12 noon, 3 to 5 and 9 to 12 p. m.
[4] Type, A1 and A2; fy., 500 (600).
[5] Type, A3; fy., 2,740 (109.5).
[6] Type, A3; fy., 2,596 (115).
[7] Type, A1; fy., 8,230 (36.45), 8,570 (35.01).
[8] Type, A1; fy., 5,525 (54.3), 5,555 (54).
[9] Type, A1, A2, and A3; fy., 5,525 (54.3), 5,555 (54).
[10] Type, B; fy., 500 (600); hours, 7 a. m. to 12 noon, 1 to 1.30, 3 to 5 and 7 to 10.30 p. m.
[11] Type, B; fy., 500 (600); hours, 7 a. m. to 12 noon, 1 to 7 and 8 to 10 p. m.
[12] Type, A1 and A2; fy., 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 147 (2,041), 149 (2,013), 151 (1987), 153 (1961), 157 (1911), 159 (1887), 160 (1875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600).
[13] Rates, Great Lakes service, 4 cents per word.
[14] Type, A1 and A2; fy., 500 (600), 441 (680).

Commercial land and ship stations, alphabetically, by call signals

[a, aeronautical station; b. ship station; c, coast (PG) station; f, fixed station]

Call signal	Name of station		Call signal	Name of station	
KFF	No. 13 (portable)	f	KMD	No. 6 (portable)	f
KFG	No. 14 (portable)	f	KMI	No. 5 (portable)	f
KFY	No. 15 (portable)	f	KMS	No. 4 (portable)	f
KGCC	Wm. A. Lydon	b	KMX	No. 3 (portable)	f
KGZ	No. 16 (portable)	f	KMY	No. 2 (portable)	f
KJA	No. 17 (portable)	f	KMZ	No. 1 (portable)	f
KJD	No. 18 (portable)	f	KNL	Oklahoma (portable)	f
KJG	No. 6 (portable)	f	KNM	do	f
KJII	Muscatine	b	KNQ	do	f
KJN	Portable	f	KNS	Texas (portable)	f
KJO	do	f	KNT	do	f
KJT	do	f	KNU	do	f
KJUA	Georgian	b	KNY	Oklahoma (portable)	f
KJW	Portable	f	KNZ	do	f
KJY	do	f	KOD	do	f
KJZ	do	f	KOF	Texas (portable)	f
KLA	No. 12 (portable)	f	KOI	do	f
KLE	No. 11 (portable)	f	KOT	do	f
KLG	No. 9 (portable)	f	KOZ	Texas and Louisiana (portable)	f
KLI	No. 8 (portable)	f	KPF	do	f
KLT	No. 10 (portable)	f	KPL	do	f
KLY	No. 7 (portable)	f	KPT	do	f

Commercial land and ship stations, alphabetically, by call signals—Continued

[a, aeronautical station; b. ship station; c, coast (PG) station; f, fixed station]

Call signal	Name of station
KPU	Texas and Louisiana (portable)—f
KRR	do—f
KRS	do—f
KRT	do—f
KRV	do—f
KRW	do—f
KRZ	do—f
KTJ	Iloilo, P. I.—f
KTL	Cebu, P. I.—f
KTN	Manila, P. I.—f
KUE	do—p
KUF	Sipaco, P. I.—p
KUG	Limay, P. I.—p
KUM	Mambajao, P. I.—c
KUQ	Naga, P. I.—
KUX	Camiguin Island, P. I.—
KZCC	San Isidro—b
KZCZ	Don Juan O—b
KZDS	Santo Domingo—b
KZDT	Isidoro Pons—b
KZDV	Fortuna—b
KZEB	Dominga-A—b
KZEC	Davao—b
KZEH	Yusingco—b
KZES	F. Escano—b
KZET	Southern Traders—b
WBB	Louisiana, Mississippi, and Texas (portable):
	No. 2A—f
WBD	No. 3A—f
WBE	No. 4A—f
WBG	No. 5A—f
WBH	No. 6A—f
WBK	No. 7A—f
WBN	No. 8A—f
WBS	No. 9A—f
WBX	No. 10A—f
	Louisiana, Mississippi, and Texas (portable)—Continued
WCA	No. 11A—f
WCB	No. 12A—f
WCD	No. 13A—f
WCH	No. 1A—f
WCM	Texas and Louisiana (portable)—f
WCN	do—f
WCO	do—f
WCP	do—f
WCR	do—f
WCS	do—f
WCU	Third zone (portable)—f
WFG	Louisiana (portable)—f
WFH	do—f
WFJ	do—f
WFM	Mississippi (portable)—f
WFN	do—f
WFP	do—f
WFQ	Louisiana (portable)—f
WFR	do—f
WFS	do—f
WFY	Third zone (portable)—f
WFZ	do—f
WBG	do—f
WHDR	Tolosa—b
WHDS	Penguin—b
WHDT	William J. O'Brien—b
WHDV	Phantom—b
WHDW	Idler—b
WHDX	Helena—b
WHDY	Blaine—b
WHDZ	Halcyon—b
WIDB	Harbor—b
WIDC	Abacena—b
WML	Sayville, N. Y.—f

Broadcasting stations, alphabetically, by names of States and cities

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

State and city	Call signal	Frequency in kilocycles, meters in parentheses	Power (watts)
Ohio, Harrison	WCKY	1,480 (202.7)	5,000
West Virginia, Bluefield	WHIS	1,420 (211.3)	100

Broadcasting stations, alphabetically, by call signals

Call signal	Location of station (address)	Owner of station	Frequency in kilocycles, meters in parentheses	Power (watts)
WCKY	Harrison, Ohio	L. B. Wilson	1,480 (202.7)	5,000
WHIS	Bluefield, W. Va.	Daily Telegraph Printing Co.	1,420 (211.3)	100

Government land stations, alphabetically, by names of stations

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

Station	Call signal	Service	Station controlled by—
Balboa, Canal Zone (control)	NFD	O	U. S. Navy.
Cavite, P. I. (Los Banos)	NLB	O	Do.
Hampton Roads, Va. (naval operating base).	NHR	O	Do.
Honolulu, Hawaii (Wailupe)	NFW	O	Do.
Honolulu, Hawaii (Heeia Point)	NHP	O	Do.
La Crosse, Wis	WSG	FA and FX.	Department of Commerce, Bureau of Lighthouses.
Puget Sound, Wash. (Bremerton)	NCH	O	U. S. Navy.
St. Louis, Mo	KCQ	FA and FX.	Department of Commerce, Bureau of Lighthouses.
San Diego, Calif. (naval headquarters)	NCD	O	U. S. Navy.
San Francisco, Calif. (naval headquarters)	NIK	O	Do.
San Juan, P. R. (control)	NCQ	O	Do.

Government land and ship stations, alphabetically, by call signals

[b, ship station; f, fixed station; c, coast (PG) station; o, official business only]

Call signal	Name of station	Call signal	Name of stantion
KCQ	St. Louis, Mo.....f and fa	NHR	Hampton Roads, Va. (naval operating base).....o
NCD	San Diego, Calif. (naval headquarters)..o	NIK	San Francisco, Calif. (naval headquarters).....o
NCH	Puget Sound, Wash. (Bremerton).....o	NLB	Cavite, P. I. (Los Banos).....o
NCQ	San Juan, P. R. (control).....o	WSG	La Crosse, Wis.....f and fa
NFD	Balboa, Canal Zone (control).....o		
NFW	Honolulu, Hawaii (Wailupe).....o		
NHP	Honolulu, Hawaii (Heeia Point).....o		

Special stations, alphabetically, by names of stations

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

Station	Call signal	Frequency in kilocycles, meters in parentheses	Power (watts)	Station controlled by—
Virginia:				
Alexandria	W3XD	1,539 (194.93), 3,256 (92.1), 4,795 (62.57).	500	Continental Broadcasting Corporation, 111 Broadway, Suite 13, New York, N. Y.
Fredericksburg	W3XF	do	500	Do.
Do	W3XG	do	500	Do.
Richmond	W3XH	do	500	Do.
Portable:				
United States	W10XA	4,280 (70.09), 8,560 (35.05)	100	Universal Wireless Communications Co.
Do	W10XB	do	100	Do.
Do	W10XC	do	100	Do.
Do	W10XD	do	100	Do.
Do	W10XE	do	100	Do.

Government land and ship stations, alphabetically, by call signals

[b, ship station; f, fixed station; c, land station]

Call signal	Name of station	Call signal	Name of station
	Third district:		Portable:
W3XD	Alexandria, Va.	W10XA	United States.
W3XF	Fredericksburg, Va.	W10XB	Do.
W3XG	Do.	W10XC	Do.
W3XH	Richmond, Va.	W10XD	Do.
		W10XE	Do.

ALTERATIONS AND CORRECTIONS

COMMERCIAL LAND STATIONS

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

AKRON, OHIO.—Station controlled by United States-Liberia Radio Corporation.
CHICAGO, ILL. (WCF).—Call changed to WFL; type, A1; fy., strike out 8,052. (37.24).
DETROIT, MICH. (WCK).—Type, A1, A2, and A3; fy., 1712 (175.23).
MARSHFIELD, OREG. RADIO.—Changed to North Bend, Oreg., Radio; fy., 455 (659.3), 500 (600), hours, N; station controlled by Coos Bay Wireless Telegraph Co.
Strike out all particulars of the following-named stations: Culver City, Calif.; Denver, Colo.; Los Angeles, Calif. (KHX).
ROCKY POINT, N. Y. (WOP).—Call changed to WQP.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY, BY NAME OF VESSELS

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

A. A. AUGUSTUS.—Fy., 375 (800), 410 (730), 454 (660).
ADAM E. CORNELIUS.—Fy., 375 (800), 410 (730), 454 (660).
ADLER.—Type, A2; fy. add 400 (750).
A. D. MACBETH.—Type B; fy., 375 (800), 410 (730), 454 (660).
ADMIRAL FISKE.—Fy., 125 (2,400), 143 (2,098), 151 (1,987), 157 (1,911), 375 (800), 425 (705), 500 (600); hours, X.
ADMIRAL SCHLEY.—Fy., 125 (2,400), 143 (2,098), 151 (1,987), 157 (1,911), 375 (800), 425 (705), 500 (600).
ADMIRAL WATSON.—Fy., 125 (2,400), 143 (2,098), 151 (1,987), 157 (1,911), 375 (800), 425 (705), 500 (600)
A. E. R. SCHNEIDER.—Fy., 375 (800), 410 (730), 454 (660); accounts, R. C. A.
ALABAMA (WPCT).—Type, A2; fy., 375 (800), 410 (730), 454 (660).
ALASKAN.—Hours X; accounts, owner.
ALDER.—Fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 157 (1,911), 160 (1,875), 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
ALGONQUIN (KGDL).—Owner, Cherokee-Seminole Steamship Corporation.
A. L. KENT.—Type, A1 and A2; fy., 131 (2,290), 133 (2,256), 135 (2,222), 137 (2,190), 139 (2,158), 141 (2,128), 143 (2,098), 145 (2,069), 147 (2,041), 149 (2,013), 151 (1,987), 160 (1,875), 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
ALLOWAY.—Type, B; fy., 375 (800), 425 (705), 500 (600).
ALMERIA LYKES.—Type A1 and A2; fy., add 400 (750), 469 (640).
ALOHA.—Type, A1 and A2; fy., 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 153 (1,961), 160 (1,875), 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
AMASA STONE.—Fy., 137 (2,190), 143 (2,098), 151 (1,987), 158 (1,900), 160 (1,875), 375 (800), 410 (730), 454 (660).
AMAZON.—Fy., 375 (800), 410 (730), 454 (660).
AMERICAN TRADER.—Fy., 375 (800), 410 (730), 425 (705), 454 (660), 500 (600); hours, N.
ANACORTES.—Fy., 375 (800), 410 (730), 425 (705), 454 (660), 500 (600).
ANGELINE.—Fy., 375 (800), 410 (730), 454 (660).
ANN ARBOR No. 4.—Fy., 375 (800), 410 (730), 454 (660).
ANN ARBOR No. 5.—Fy., 375 (800), 410 (730), 454 (660).
ANN ARBOR No. 7.—Fy., 375 (800), 410 (730), 454 (660).
ARAS.—Fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 157 (1,911), 160 (1,875), 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
ARCADIA.—Owner, Mrs. Margaret S. Hardwick.
ARCTIC.—Hours, X.
ARGOSY.—Fy., 375 (800), 420 (715), 425 (705), 454 (660), 500 (600).
ARIZPA.—Type, B; fy., 375 (800), 425 (705), 500 (600).
ARTEMIS.—Fy., 375 (800), 425 (705), 500 (600).
ASHTABULA.—Fy., 375 (800), 410 (730), 454 (660).
ATLANTA CITY.—Type, A1 and A2; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 157 (1,911), 160 (1,875), 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).

ATLANTIC (WQBG).—Fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600).
BARNEY, JR.—Fy., 375 (800), 410 (730), 425 (705), 454 (660), 500 (600).
BASCOBEL.—Owner, Tennessee Coal, Iron & Railroad Co., accounts, owner.
BELLINGHAM.—Accounts, owner.
BENSON FORD.—Type, B and A1 and A2; fy., 375 (800), 420 (715), 454 (660).
BERURY.—Type, B; fy., 375 (800), 425 (705), 500 (600).
BETHLEHEM.—Fy., 375 (800), 410 (730), 454 (660).
BOHEMIAN CLUB.—Fy., 125 (2,400), 131 (2,290), 137 (2,190), 141 (2,128), 143 (2,098), 149 (2,013), 151 (1,987), 157 (1,911), 160 (1,875), 375 (800), 500 (600).
BOSTON.—Fy., add 151 (1,987).
BOSTON COLLEGE.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
CACIQUE.—Fy., strike out 469 (640).
CADILLAC.—Fy., 375 (800), 410 (730), 454 (660).
CALAMARES.—Fy., 137 (2,190), 141 (2,128), 143 (2,098) 145 (2,069), 147 (2,041), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600).
CALMAR.—Fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
CALVIN AUSTIN.—Hours, X.
CAMAGUEY.—Hours, N.
CAMBRIA.—Fy., 375 (800), 410 (730), 454 (660).
CAMBRIDGE.—Fy., strike out 343 (875).
CAPTAIN A. F. LUCAS.—Fy., add 469 (640).
CAROLINA.—Type, A2; fy., 375 (800), 410 (730), 454 (660).
CAROLINE.—Type, A1 and A2; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 157 (1,911), 160 (1,875), 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
CARRILLO.—Fy., 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 147 (2,041), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600).
CHARLES C. WEST.—Fy., 375 (800), 410 (730), 454 (660).
CHARLES L. HUTCHINSON.—Fy., 375 (800), 410 (730), 454 (660).
CHARLES L. O'CONNOR.—Fy., add 375 (800).
CHARLES M. EVEREST.—Fy., add 469 (640).
CHILBAR.—Hours, X.
CHILORE.—Fy., add 469 (640).
CHIPPEWA.—Fy., 375 (800), 410 (730), 454 (660).
CHRISTOPHER COLUMBUS.—Fy., 375 (800), 454 (660); hours, X.
CITIES SERVICE EMPIRE.—Type, B; fy., 375 (800), 410 (730), 425 (705), 454 (660), 500 (600).
CITIES SERVICE KOOLMOTOR.—Type, B and A arc; fy., 125 (2,400), 143 (2,098), 151 (1,987), 159 (1,887), 375 (800), 425 (705), 500 (600).
CITY OF ATLANTA.—Fy., 375 (800), 410 (730), 425 (705), 454 (660), 500 (600).
CITY OF BUFFALO.—Fy., 375 (800), 410 (730), 454 (660).
CITY OF DALHART.—Fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 149 (2,013), 151 (1,987), 157 (1,911), 159 (1,887), 160 (1,875), 500 (600).
CITY OF ERIE.—Fy., 375 (800), 410 (730), 454 (660).
CITY OF GRAND RAPIDS.—Fy., 375 (800), 410 (730), 454 (660).
CITY OF HOLLAND.—Fy., 375 (800), 410 (730), 454 (660), service, PG; hours, X.
CITY OF SAUGATUCK.—Fy., 375 (800), 410 (730), 454 (660); hours, X.
CITY OF SAVANNAH.—Fy., 375 (800), 410 (730), 425 (705), 454 (660), 500 (600).
CITY OF ST. JOSEPH.—Fy., 375 (800), 410 (730), 454 (660); hours, X.
CITY OF ST. LOUIS.—Fy., 375 (800), 410 (730), 425 (705), 454 (660), 500 (600).
CITY OF VICTORIA.—Service, PG; hours, X.
CLAIRTON.—Hours, N. (first class), X (third class).
CLEMENT SMITH.—Fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
CLETUS SCHNEIDER.—Fy., 375 (800), 410 (730), 454 (660).
CLIFFORD F. MOLL.—Fy., 375 (800), 410 (730), 454 (660).
COLDWATER.—Owner, South Atlantic S. S. Co.
COLOMBIA.—Type, A1 and A2; fy., 125 (2,400), 137 (2,190), 143 (2,098), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 425 (705), 454 (660), 469 (640), 500 (600).
COLONEL.—Fy., 375 (800), 410 (730), 454 (660).

COLONEL JAMES M. SCHOONMAKER.—Type, A2; fy., 375 (800), 410 (730), 454 (660); accounts, R. C. A.
COLONEL JAMES PICKANDS.—Fy., 141 (2,128), 143 (2,098), 151 (1,987), 158 (1,900), 160 (1875), 375 (800), 410 (730), 454 (660).
COLRAINE.—Type, A2; fy., 375 (800), 425 (705), 469 (640), 500 (600); owner, E. W. Noble.
COMMERCIAL MARINER.—Type, A1 and A2; fy., add 400 (750), 469 (640).
COMMERCIAL NAVIGATOR.—Fy., add 375 (800).
COMMERCIAL QUAKER.—Type, A2; fy., add 469 (640).
COMMERCIAL TRAVELER.—Fy., add 400 (750), 469 (640).
CONCORD.—Type, A1 and A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600); hours, N.
CONDOR.—Hours, X.
COOT.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 500 (600).
CORINTO.—Type, A1 and A2; fy., 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600).
CORONET.—Type, A1 and A2; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1987), 157 (1911), 160 (1875), 375 (800), 400 (750), 425 (705), 469 (640), 500 (600); service, PG; hours, X; rates, all services, 8 cents per word.
CORSAIR.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
CORVUS.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
COURAGEOUS.—Type, B and A arc; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 151 (1,987), 153 (1,961), 157 (1,911), 160 (1,875), 375 (800), 425 (705), 500 (600).
CRAIGSMERE.—Fy., add 375 (800).
CRESSIDA.—Service, PG; hours X; rates, 8 cents per word.
CREST (KGAU).—Fy., add 375 (800).
CRISTOBAL.—Rates, North and South American service 4 cents per word, transoceanic service, 8 cents per word.
CROFTON HALL.—Hours, N.
CUBA.—Hours, N.
DANIEL J. MORRELL.—Fy., 375 (800), 410 (730), 454 (660).
DANIEL KERN.—Fy., add 375 (800); rates, 8 cents per word.
DAVID MCKELVY.—Type A2; fy., add 469 (640).
DAVID P. THOMPSON.—Fy., 375 (800), 410 (730), 454 (660).
DEAN EMERY.—Fy., add 469 (640).
D. E. CALLENDER.—Fy., 375 (800), 410 (730), 454 (660); accounts, R. C. A.
DELANSON.—Name changed to Exilona; owner, Export Steamship Corporation; accounts, R. M. C. A.
DELAWARE SUN.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
DELISLE.—Fy., add 159 (1887).
DIAMOND CEMENT.—Hours, N. (first class), X (third class); accounts R. M. C. A.
DISTRICT OF COLUMBIA.—Type, B; fy., 125 (2,400), 143 (2,098), 151 (1,987), 157 (1,911), 375 (800), 425 (705), 500 (600).
DIXIE.—Hours, N; accounts, owner.
DIXIE ARROW.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
DOROTHY ALEXANDER.—Fy., 125 (2,400), 143 (2,098), 151 (1,987), 157 (1,911), 375 (800), 425 (705), 500 (600).
DOUGLAS.—Fy., 375 (800), 425 (705), 500 (600).
DRYDEN.—Type, B and A arc; fy., 125 (2,400), 131 (2,290), 133 (2,256), 135 (2,222), 141 (2,128), 143 (2,098), 145 (2,069), 147 (2,041), 149 (2,013), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 425 (705), 500 (600).
DULCINO.—Fy., add 469 (640).
E. G. MATHIOTT.—Accounts, R. M. C. A.
EUZKADI.—Name changed to Southern Trader.
EVERETT.—Name changed to Union.
EXANTHIA.—Fy., 375 (800), 425 (705), 500 (600).
EXCELLENCY.—Fy., 375 (800), 425 (705), 500 (600).
EXCELLO.—Fy., 375 (800), 425 (705), 500 (600).
EXCHESTER.—Hours, N.
EXFORD.—Fy., 375 (800), 425 (705), 500 (600).
EXIRIA.—Fy., 375 (800), 425 (705), 500 (600).
EXMINSTER.—Fy., 375 (800), 425 (705), 500 (600).

FAIRFIELD.—Type, A1 and A2; fy., 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 157 (1,911), 160 (1,875), 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
FAITH.—Fy., add 469 (640); rates, 8 cents per word; owner, Courtland S. Brown.
FELTORE.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
FISHER.—Type, B.
FLORENCE LUCKENBACH.—Fy., strike out 343 (875).
FONTANA.—Fy., 375 (800), 410 (730), 454 (660).
FRANK BILLINGS.—Fy., 375 (800), 410 (730), 454 (660).
FRANK H. GOODYEAR.—Fy., 375 (800), 410 (730), 454 (660); rates, Great Lakes service, 4 cents per word.
FRANKLIN K. LANE.—Fy., add 469 (640).
FRANK SEITHER.—Fy., 375 (800), 410 (730), 454 (660).
FRED G. HARTWELL.—Fy., 375 (800), 410 (730), 454 (660).
FREEMAN.—Type A1 and A2; fy., add 469 (640).
FREEPORT SULPHUR No. 6.—Fy., add 469 (640).
FRONTENAC.—Fy., 375 (800), 410 (730), 454 (660).
GALE.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600); rates, 8 cents per word.
GARGOYLE.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
G. A. TOMLINSON.—Fy., 375 (800), 410 (730), 454 (660).
GEMMA.—Type A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
GEORGE H. INGALLS.—Fy., 410 (730), 454 (660).
GEORGE PIERCE.—Correct orthography George Pierce; type, B and A arc; fy., 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 153 (1,961), 157 (1,911), 375 (800), 425 (705), 500 (600).
GEORGETOWN.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
G. J. GRAMMER.—Fy., 410 (730), 454 (660); rates, Great Lakes service, 4 cents per word.
GLADYSBE.—Fy., 375 (800), 425 (705), 500 (600).
GLENPOOL.—Fy., add 469 (640).
G. N. WILSON.—Fy., 410 (730), 454 (660).
GOLDEN HARVEST.—Fy., strike out 343 (875).
GOLDEN KAURI.—Fy., 375 (800), 425 (705), 500 (600).
GOLDEN SUN.—Fy., 125 (2,400), 137 (2,190), 143 (2,098), 151 (1,987), 375 (800), 425 (705), 500 (600).
GOLIAH (WTBP).—Type, B., fy., 375 (800), 425 (705), 500 (600); service, PG., hours, X; rates, 8 cents per word; accounts, owner.
GOODTIME.—Fy., 375 (800), 410 (730), 454 (660).
GRAND ISLAND.—Fy., 375 (800), 410 (730), 454 (660).
GREYLOCK.—Fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 157 (1,911), 160 (1,875), 375 (800), 454 (660), 500 (600).
GUINEVERE.—Service, P; no rates.
GULFHAWK.—Type, A1 and A2; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 157 (1,911), 160 (1,875), 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
GULFKING.—Fy., 375 (800), 425 (705), 500 (600).
GULFPRINCE.—One word.
GULFQUEEN.—One word.
GULFSTATE.—Fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 500 (600).
GULFWING.—Type, A1 and A2; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 157 (1,911), 160 (1,875), 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
HALEAKALA.—Hours, X.
HAMILTON.—Hours, N.
HAROLD WALKER.—Fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
HARRY YATES.—Fy., 375 (800), 410 (730), 454 (660).
HENRY P. WERNER.—Fy., 375 (800), 410 (730), 454 (660).
H. F. ALEXANDER.—Fy., 125 (2,400), 143 (2,098), 151 (1,987), 157 (1,911), 375 (800), 425 (705), 500 (600).
HUGH KENNEDY.—Fy., 410 (730), 454 (660).
HUMACONNA.—Fy., 375 (800), 410 (730), 425 (705), 500 (600).
HUMBOLDT.—Owner, Los Angeles-San Francisco Navigation Co.
HUMRICK.—Fy., 375 (800), 410 (730), 425 (705), 454 (660), 500 (600).
IDALIA.—Owner, Painless Parker.

ILLINOIS (WPCY).—Type, A2; fy., 375 (800), 410 (730), 454 (660); hours, N (first class), X (third class).
INDIA ARROW.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
INDIANA (WPCZ).—Type, A2; fy., 375 (800), 410 (730), 454 (660).
INTERNATIONAL.—Hours, N.
IROQUOIS (KGGY).—Service, PG; hours, X; rates, 8 cents per word.
ISHPEMING.—Fy., 375 (800), 410 (730), 454 (660).
J. A. BOSTWICK.—Type, A1 and A2; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 157 (1,911), 160 (1,875), 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
JALAPA.—Fy., 125 (2,400), 131 (2,290), 137 (2,190), 141 (2,128), 143 (2,098), 149 (2,013), 151 (1,987), 157 (1,911), 160 (1,875), 375 (800), 425 (705), 500 (600).
JAMES E. FERRIS.—Fy., 375 (800), 410 (730), 454 (660).
JAMES MACNAUGHTON.—Fy., 375 (800), 410 (730), 454 (660).
JAMES P. WALSH.—Fy., 375 (800), 410 (730), 454 (660).
JAPAN ARROW.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
JAVA ARROW.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
JEFFERSON.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
JEFFERSON MYERS.—Type, A arc; fy., 125 (2,400), 137 (2,190), 143 (2,098), 151 (1,987), 375 (800), 425 (705), 500 (600).
J. E. O'NEIL.—Type, A1 and A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
J. E. SAVAGE.—Fy., 375 (800), 410 (730), 454 (660); accounts, R. C. A.
JEZEBEL.—Type, A1 and A2; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 157 (1,911), 160 (1,875), 375 (800), 400 (750), 425 (705), 469 (640), 500 (600); service, PG; hours X; rates, 8 cents per word.
J. FLETCHER FARRELL.—Fy., add 469 (640).
J. H. SHEADLE.—Fy., 375 (800), 410 (730), 454 (660).
J. J. SULLIVAN.—Fy., 375 (800), 410 (730), 454 (660).
J. N. PEW.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
JOHN A. DONALDSON.—Fy., 375 (800), 410 (730), 454 (660).
JOHN ANDERSON.—Accounts, R. C. A.
JOHN CUDAHY.—Owner, Hubble Towing Co.
JOHN MCCARTNEY KENNEDY.—Accounts, R. C. A.
LEVIATHAN LIFEBOAT No. 31.—Fy., add 375 (800); no rates.
LEVIATHAN LIFEBOAT No. 32.—Fy., add 375 (800); no rates.
MAITLAND No. 1.—Type, A1 and A2; fy., 375 (800), 410 (730), 454 (660).
MARJ III.—Accounts, R. M. C. A.
MIAMI.—Type, A1 and A2; service, PG; hours, N.
MINEOLA.—Type, A1 and A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
MOHAWK (KFYU).—Hours, N.
MOUNT HOPE.—Fy., add 375 (800).
NORTH KING.—Accounts, R. M. C. A.
NOURMAHAL.—Service, PG; hours, N (first class), X (third class); rates, 8 cents per word.
O. S. MCFARLAND.—Accounts, R. C. A.
PEARY.—Owner, Matthew F. Bramley.
PORTLAND TRAWLING CO.—Change general call signal to KGPT.
RAYO.—Name changed to Rawleigh Warner.
RIPPLE (KFLF).—Owner, E. E. Bishop; accounts, R. M. C. A.
SALMON KING.—Owner, Crosby Fisheries.
SALVATION LASS.—Fy., strike out 343 (875).
SAMUEL MATHER.—Fy., 141 (2,128), 143 (2,098), 151 (1,987), 158 (1,900), 160 (1,875), 375 (800), 410 (730), 454 (660).
SAN JUAN (WFDE).—Owner, Los Angeles-San Francisco Navigation Co.
SAN MATEO.—Hours, N (first class), X (third class).
S. B. WAY.—Accounts, R. C. A.
SEEKONK.—Name changed to Willmoto.
STARR.—Hours, N (first class), X (third class).
SUNDANCE.—Owner, South Atlantic S. S. Co.
SURIGAO.—Name changed to Euzkadi.
THOMAS BRITT.—Accounts, R. C. A.
TRACY BROTHERS.—Owner, Avondale Transport Corporation.
VIKING.—Type B and A1.

WESTERN STATES.—Type B and A1 and A2; fy., 167 (1,796), 375 (800), 410 (730), 454 (660).
WEST HARTS.—Name changed to Texas.
WILLIAM NELSON.—Accounts, R. C. A.
YALZA.—Accounts, R. M. C. A.

Strike out all particulars of the following-named vessels: Fisherman, Iconium, John Purroy Mitchel, Ortega, Socony 92, Wahkeena.

NOTE.—The list of ship stations published in the November 30, 1928, edition of the Radio Service Bulletin, No. 140, as being no longer controlled by the Intercity Radio Telegraph Co., means only that this company is no longer responsible for the radio message accounts.

COMMERCIAL LAND AND SHIP STATIONS, APLHABETICALLY, BY CALL SIGNALS

KDLT, *read* George Peirce; KDRB, *read* Gulfprince; KEFZ, *read* Texas; KGN, *read* North Bend, Oreg.; KIGF, *read* Willmoto; KOTX, *read* Exilona; KZCJ, *read* Union; KZDU, *read* Euzkadi; WCF, call changed to WFL; WHDT, call changed to KGPT; WJCH, *read* Gulfqueen; WOP, call changed to WQP; WSCQ, *read* Rawleigh Warner; strike out all particulars following the call signals, KFD, KHX, KJU, KUGK, WCDZ, WCOI, WHCN, WQUO, WRBE.

COMMERCIAL AIRCRAFT STATIONS, ALPHABETICALLY, BY NAMES OF VESSELS

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

No. 5092 (KHAZ).—Change to Standard of California.

BROADCASTING STATIONS, BY CALL SIGNALS

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

KEJK (Beverly Hills, Calif.).—Fy., 1,170 (256.4).
KFBB (Havre, Mont.).—Changed to Great Falls, Mont.; power, 500.
KFCB (Phoenix, Ariz.).—Call changed to KOY.
KFKB (Milford, Kans.).—Fy., 1,050 (285.7).
KFPY (Spokane, Wash.).—Owner, Symons Broadcasting Co.
KFQZ (Hollywood, Calif.).—Owner, Taft Radio & Broadcasting Co.; fy., 860 (349).
KFUO (Clayton, Mo.).—Power 500 night, 1,000 day.
KFVD (Culver City, Calif.).—Owner, Auburn-Fuller Co., 6,400 Washington Boulevard.
KGCB (Enid, Okla.).—Call changed to KCRC; owner, Champlin Refining Co.
KGDM (Stockton, Calif.).—Fy., 1,100 (272.7).
KGDR (San Antonio, Tex.).—Owner KGDR Broadcasting Co., address Blue Bonnett Hotel; power, 100.
KGFI (San Angelo, Tex.).—Owner, Eagle Broadcasting Co.
KGGH (Cedar Grove, La.).—Call changed to KTSL.
KGIO (Idaho Falls, Idaho).—Call changed to KID.
KGTT (San Francisco, Calif.).—Call changed to KGGC.
KJBS (San Francisco, Calif.).—Fy., 1,150 (260.9).
KLDS (Independence, Mo.).—Owner, Midland Broadcasting Co.
KMBC (Independence, Mo.).—Owner, Midland Broadcasting Co.
KMED (Medford, Oreg.).—Owner, Mrs. W. J. Virgin.
KOIL (Council Bluffs, Iowa).—Power, 1,000 night, 2,500 day.
KRGV (Harlingen, Tex.).—Owner, Valley Radio Electric Corporation.
KSBA (Shreveport, La.).—Owner, S. R. Elliot and A. C. Steere.
KSOO (Sioux Falls, S. Dak.).—Power, 2,000.
KTAP (San Antonio, Tex.).—Owner, Alamo Broadcasting Co.
KUT (Austin, Tex.).—Owner, KUT Broadcasting Co.
KVOO (Tulsa, Okla.).—Power, 5,000.
KWKH (Kennonwood, La.).—Power, 5,000.
KYWA (Chicago, Ill.).—Power, 500.
WAAM (Newark, N. J.).—Power, 1,000 night, 2,000 day.
WAPI (Auburn, Ala.).—Changed to Birmingham, Ala.; power, 5,000.
WBAL (Glen Morris, Md.—Baltimore).—Power, 10,000.
WBET (Medford, Mass.).—Call changed to WLEX; location, changed to Lexington, Mass.; owner, Lexington Air Stations.

WBIS (Boston, Mass.).—Owner, Shepard Norwell Co.
WDAE (Tampa, Fla.).—Fy., 620 (484); power, 1,000.
WDGY (Minneapolis, Minn.).—Fy., 560 (536), power, 500.
WEAI (Ithaca, N. Y.).—Fy., 1270 (236.2); power, 500.
WHDI (Minneapolis, Minn.).—Fy., 560 (536).
WHK (Cleveland, Ohio).—Power, 1,000 night, 2,000 day.
WHT (Deerfield, Ill.).—Call changed to WSOA.
WIBW (Topeka, Kans.).—Owner, Topeka Broadcasting Association.
WJAK (Kokomo, Ind.).—Owner, Marion Broadcasting Co.).
WJBK (Ypsilanti, Mich.).—Owner, James F. Hopkins.
WJJD (Mooseheart, Ill.).—Fy., 1,130 (265.5).
WKBC (Birmingham, Ala.).—Owner, R. H. Broyles Furniture Co.; power, 100.
WLBH (Farmingdale, N. Y.).—Owner, Nassau Broadcasting Corporation.
WLEX (Lexington, Mass.).—Call changed to WLEY.
WLOE (Chelsea, Mass.).—Power, 100 night, 250 day.
WMPC (Lapeer, Mich.).—Power, 100.
WNAC (Boston, Mass.).—Owner, Shepard Norwell Co.
WNAX (Yankton, S. Dak.).—Owner, Gurney Seed & Nursery Co.
WPCH (Hoboken, N. J.).—Owner, Eastern Broadcasters, Inc.
WQAM (Miami, Fla.).—Owner, Miami Broadcasting Co.; 600 Biscayne Boulevard; power, 1,000.
WSSH (Boston, Mass.).—Power, 100 night, 250 day.
WWNC (Asheville, N. C.).—Owner, Citizen Broadcasting Co.

Strike out all particulars of the following-named stations: KFDX (Shreveport, La.); KGDP (Pueblo, Colo.); WOO (Philadelphia, Pa.); WQBJ (Clarksburg, W. Va.).

GOVERNMENT LAND STATIONS, ALPHABETICALLY, BY NAMES OF STATIONS

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

BALBOA, CANAL ZONE.—Change to read Balboa, Canal Zone (Darien).
HEEIA POINT, HAWAII.—Strike out, see Honolulu, Hawaii; call changed to NHP.
HONOLULU, HAWAII (Heeia Point and Pearl Harbor).—Change to read Honolulu, Hawaii (Pearl Harbor); service, O.
SAN DIEGO, CALIF. (traffic station-NPL).—Change to read San Diego, Calif. (Chollas Heights).
SAN FRANCISCO, CALIF. (NPG).—Change to read San Francisco, Calif. (Mare Island).
SAN JUAN, P. R.—Change to read San Juan, P. R. (Cayey).

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY, BY CALL SIGNALS

NAU, *read* San Juan, P. R. (Cayey); NBA, *read* Balboa, Canal Zone (Darien); NPG, *read* San Francisco, Calif. (Mare Island); NPL, *read* San Diego, Calif. (Chollas Heights); NPM, *read* Honolulu, Hawaii (Pearl Harbor); the following corrections should be made in the edition of the Bulletin for last month: NUDJ, call changed to WTDC; NURK, call changed to WTDD; NURP, call changed to WTDA; NURQ, call changed to WTDB.

SPECIAL STATIONS, BY NAMES OF STATIONS

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

HARTFORD, CONN. (portable-W1XG).—Station now stationary; fy. 1,060 (283); power, 50,000; station controlled by Travelers Broadcasting Service Corporation.

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, 1928, and to the International List of Radiotelegraph Stations published by the Berne bureau]

JUPITER INLET LIGHT STATION, FLA.—Hours, continuously during thick or foggy weather and daily in clear weather from 12 to 12.15, 3 to 3.15, 6 to 6.15, and 9 to 9.15 a. m. and p. m.
ST. JOHNS RIVER, FLA.—Hours, daily in clear and foggy weather for the last 15 minutes of each hour.

MISCELLANEOUS

GENERAL ORDER OF THE FEDERAL RADIO COMMISSION

Postponement of General Order No. 43, limiting chain programs (General Order No. 59, February 16, 1929).—The Federal Radio Commission hereby further postpones the effective date of General Order No. 43, limiting duplicated operation on cleared channels to stations more than 300 miles apart, 90 days, until June 1, 1929.

Broadcasting stations, alphabetically by States and cities

[See footnotes to this list on p. 24]

State and city	Call signal	Owner	Frequency in kilocycles, meters in parentheses	Power (watts)
Alabama:				
Birmingham	WAPI	Alabama Polytechnic Institute	1,140 (263.2)	5,000
Do	WBRC	Birmingham Broadcasting Co	930 (323)	500
Do	WKBC	R. H. Broyles Furniture Co	1,310 (229)	100
Gadsden	WJBY	Electric Construction Co	1,210 (247.9)	50
Montgomery	WIBZ	A. D. Trum	1,500 (200)	15
Alaska:				
Anchorage	KFQD	Anchorage Radio Club	1,230 (243.9)	100
Juneau	KFIU	Alaska Electric Light & Power Co	1,310 (229)	10
Ketchikan	KGBU	Alaska Radio & Service Co	900 (333)	500
Arizona:				
Flagstaff	KFXY	Miss Mary M. Costigan (Orpheum Theatre).	1,420 (211.3)	100
Phoenix	KFAD	Electrical Equipment Co	620 (484)	500
Do	KOY	Nielsen Radio Supply Co	1,310 (229)	100
Prescott	KPJM	Frank Wilburn	1,500 (200)	100
Tucson	KGAR	Tucson Motor Service Co	1,370 (219)	100
Arkansas:				
Blytheville	KLCN	C. L. Lintzenich	1,290 (232.6)	50
Fayetteville	KUOA	University of Arkansas	1,390 (215.8)	1,000
Hot Springs	KTHS	Hot Springs Chamber of Commerce	800 (375)	10,000
Little Rock	KGJF	First Church of the Nazarene	890 (337)	250
Do	KGHI	Berean Bible Class	1,500 (200)	100
Do	KLRA	Arkansas Broadcasting Co	1,390 (215.8)	500
McGehee	KGHG	Charles W. McCollum	1,310 (229)	50
Siloam Springs	KFPW	Rev. Lannie W. Stewart	1,340 (223.9)	50
California:				
Alma (Holy City)	KFQU	W. E. Riker	1,420 (211.3)	100
Berkeley	KRE	First Congregational Church	1,370 (219)	100
Beverley Hills	KEJK	R. S. MacMillan	1,170 (256.4)	500
Burbank	KELW	Earl L. White	780 (386)	500
Culver City	KFVD	Auburn-Fuller Co	700 (429)	250
El Centro	KXO	E. R. Irey and F. M. Bowles	1,200 (250)	100
Fresno	KMJ	Fresno Bee	1,200 (250)	100
Glendale	KGFH	Frederick Robinson	1,000 (300)	250
Hayward	KZM	Leon P. Tenney	1,370 (219)	100
Hollywood	KFQZ	Taft Radio & Broadcasting Co	860 (349)	250
Do	KFWB	Warner Bros. Broadcasting Corporation	950 (316)	1,000
Inglewood	KMIC	James R. Fouch	1,120 (267.9)	500
Long Beach	KFOX	Nichols & Warriner	1,250 (240)	1,000
Do	KGER	C. Merwin Dobyns	1,370 (219)	100
Los Angeles	KFI	Earl C. Anthony, Inc	640 (469)	5,000
Do	KFSG	Echo Park Evangelistic Association	1,120 (267.9)	500
Do	KGEF	Trinity Methodist Church	1,300 (230.8)	1,000
Do	KGFJ	Ben S. McGlashan	1,420 (211.3)	100
Do	KHJ	Don Lee (Inc.)	900 (333)	1,000
Los Angeles (Hollywood).	KMTR	KMTR Radio Corporation	570 (526)	500
Do [6]	KNX	Western Broadcast Co	1,050 (285.7)	5,000
Los Angeles	KPLA	Pacific Development Radio Co	570 (526)	1,000
Do	KTBI	Bible Institute of Los Angeles	1,300 (230.8)	750
Oakland	KFWM	Oakland Educational Society	930 (323)	500
Do	KGO	General Electric Co	790 (380)	7,500
Do	KLS	Warner Bros. Radio Supplies Co	1,440 (208.3)	250
Do	KLX	Tribune Publishing Co	880 (341)	500
Do	KTAB	Associated Broadcasters	550 (545)	500
Ontario [7]	KFWC	James R. Fouch	1,200 (250)	100
Pasadena	KPPC	Pasadena Presbyterian Church	1,200 (250)	50
Do	KPSN	Pasadena Star News	950 (315.6)	1,000
Sacramento	KFBK	James McClatchy Co	1,310 (229)	100
San Diego	KFSD	Airfan Radio Corporation	600 (500)	[1] 1,000 [2] 500
Do	KGB	Pickwick Broadcasting Corporation	1,360 (220.6)	250

Broadcasting stations, alphabetically by States and cities—Continued

[See footnotes to this list on p. 24]

State and city	Call signal	Owner	Frequency in kilocycles, meters in parentheses	Power (watts)
California—Continued.				
San Francisco	KFRC	Don Lee (Inc.)	610 (492)	1,000
Do	KFWI	Radio Entertainments (Inc.)	930 (323)	500
Do	KGGC	The Golden Gate Broadcasting Co	1,420 (211.3)	50
Do	KJBS	Julius Brunton & Sons Co	1,150 (260.9)	100
Do	KPO	Hale Bros. and The Chronicle	680 (441)	1,000
Do	KYA	Pacific Broadcasting Corporation	1,230 (243.9)	1,000
Jan Jose	KQW	First Baptist Church	1,010 (296.9)	500
Santa Ana	KWTC	Pacific-Western Broadcasting Federation	1,500 (200)	100
Santa Barbara	KDB	Santa Barbara Broadcasting Co	1,500 (200)	100
Santa Maria	KSMR	Santa Maria Valley R. R. Co	1,200 (250)	100
Santa Monica [8]	KTM	The Pickwick Broadcasting Corporation	780 (385)	500
Stockton	KGDM	E. F. Peffer	1,100 (272.7)	50
Do	KWG	Portable Wireless Telephone Co	1,200 (250)	100
Westminster (Santa Ana)[39].	KPWF	Pacific-Western Broadcasting Federation	1,490 (201.3)	
Colorado:				
Belleview College (Denver).	KPOF	Pillar of Fire (Inc.)	880 (341)	500
Colorado Springs	KFUM	W. D. Corley	1,270 (236.2)	1,000
Denver	KFEL	Eugene P. O'Fallon (Inc.)	940 (319)	250
Do	KFUP	Fitzsimons General Hospital	1,310 (229)	100
Do	KFXF	Pikes Peak Broadcasting Co	940 (319)	250
Do	KOA	General Electric Co	830 (361)	12,500
Denver (near)	KOW	Associated Industries	1,390 (215.8)	500
Dupont	KLZ	Reynolds Radio Co	560 (536)	1,000
Edgewater (near)	KFXJ	R. G. Howell	1,310 (229)	50
Fort Morgan	KGEW	City of Fort Morgan	1,200 (250)	100
Greeley	KFKA	Colorado State Teachers College	880 (341)	[1] 1,000 [2] 500
Gunnison	KFHA	Western State College of Colorado	1,200 (250)	50
Pueblo	KGHF	Curtis P. Ritchie and Joe E. Finch	1,320 (227.3)	250
Trinidad	KGIW	Trinidad Creamery Co	1,420 (211.3)	100
Yuma	KGEK	Beehler Electrical Equipment Co	1,200 (250)	50
Connecticut:				
Easton [9]	WICC	The Bridgeport Broadcasting Station (Inc.)	1,190 (252.1)	500
Hartford	WTIC	The Travelers Broadcasting Service Corporation.	600 (500)	250
Mansfield	WCAC	Connecticut Agricultural College	600 (500)	250
New Haven	WDRC	Doolittle Radio Corporation	1,330 (225.6)	500
Delaware:				
Wilmington	WDEL	WDEL (Inc.)	1,410 (212.8)	[1] 350 [2] 250
Do	WILM	Delaware Broadcasting Co	1,500 (200)	100
District of Columbia:				
Washington	WOL	American Broadcasting Co	1,310 (229)	100
Do	WRC	Radio Corporation of America	950 (316)	500
Do	WMAL	M. A. Leese	630 (476)	[5] 500 250
Florida:				
Clearwater	WFLA	Clearwater Chamber of Commerce and St. Petersburg Chamber of Commerce.	900 (333)	750
Gainesville	WRUF	University of Florida	1,470 (204.1)	5,000
Jacksonville	WJAX	City of Jacksonville	1,260 (238.1)	1,000
Lakeland	WMBL	Benford Radio Studios	1,310 (229)	100
Miami	WQAM	Miami Broadcasting Co	1,240 (241.9)	1,000
Miami Beach	WIOD	Isle of Dreams Broadcasting Co	1,240 (241.9)	1,000
Do	WMBF	Fleetwood Hotel	560 (536)	500
Orlando	WDBO	Rollins College	620 (484)	1,000
Pensacola	WCOA	City of Pensacola	1,120 (267.9)	500
Sarasota	WSIS	The Sarasota County Chamber of Commerce.	1,010 (297.0)	250
St. Petersburg	WSUN	Clearwater Chamber of Commerce and St. Petersburg Chamber of Commerce.	900 (333)	750
Tampa	WDAE	Tampa Daily News	620 (484)	1,000
Do	WMBR	F. J. Reynolds	1,210 (247.9)	100
Georgia:				
Atlanta	WGST	Georgia School of Technology	890 (337)	[1] 500 [2] 250
Do	WSB	Atlanta Journal	740 (405)	1,000
Do	WTHS	Atlanta Technological High School	1,310 (229)	100
Columbus	WRBL	R. E. Martin	1,200 (250)	50
Macon	WMAZ	Mercer University	890 (337)	[1] 500 [2] 250
Tifton	WRBI	Kents Furniture and Music Store	1,310 (229)	20
Toccoa	WTFI	Toccoa Falls Institute	1,450 (206.9)	500

Broadcasting stations, alphabetically by States and cities—Continued

[See footnotes to this list on p. 24]

State and city	Call signal	Owner	Frequency in kilocycles, meters in parentheses	Power (watts)
Hawaii:				
Honolulu	KGHB	Radio Sales Co	1,320 (227.3)	250
Do	KGU	Marion A. Mulrony	940 (319)	500
Idaho:				
Boise	KIDO	Boise Broadcast Station	1,250 (240)	1,000
Idaho Falls	KID	Jack W. Duckworth, jr	1,320 (227.3)	250
Jerome	KFXD	Service Radio Co	1,420 (211.3)	50
Kellogg	KFEY	Union High School	1,210 (247.9)	10
Pocatello	KSEI	KSEI Broadcasting Association	900 (333)	250
Sandpoint	KGKX	C. E. Twiss	1,420 (211.3)	15
Twin Falls	KGIQ	Stanley M. Soule	1,320 (227.3)	250
Illinois:				
Addison [10]	WMAQ	Chicago Daily News	670 (448)	5,000
Do	WMBI	Moody Bible Institute	1,080 (277.8)	5,000
Batavia [10]	WORD	Peoples Pulpit Association	1,480 (202.7)	5,000
Carthage	WCAZ	Carthage College	1,070 (280.4)	50
Chicago	KFKX	Westinghouse Electric & Manufacturing Co	1,020 (294.1)	[3] 5,000
	KYW			[4] 10,000
Do	KYWA	do	1,020 (294.1)	500
Do	WAAF	Drovers Journal Publishing Co	920 (326)	500
Do	WCFL	Chicago Federation of Labor	970 (309)	1,500
Do	WCRW	Clinton R. White	1,210 (247.9)	100
Do	WEDC	Emil Denemark	1,210 (247.9)	100
Do	WENR	Great Lakes Radio Broadcasting Co	870 (345)	[3] 25,000
	WBCN			[4] 50,000
Do	WGES	Oak Leaves Broadcasting Corporation	1,360 (220.6)	500
Do	WHFC	Goodson & Wilson	1,310 (229)	100
Do	WKBI	Fred L. Schoenwolf	1,310 (229)	50
Do	WPCC	North Shore Congregational Church	570 (526)	500
Do	WSBC	World Battery Co	1,210 (247.9)	100
Crete [10]	WLS	Agricultural Broadcasting Co	870 (345)	5,000
Decatur	WJBL	William Gushard Dry Goods Co	1,200 (250)	100
Deerfield [10]	WSOA	Radiophone Broadcasting Corporation	1,480 (202.7)	5,000
Desplaines [10]	WIBO	Nelson Brothers Bond & Mortgage Co	570 (526)	[1] 1,500
Elgin [10]	WGN	The Tribune Co	720 (417)	[2] 1,000
	WLIB			25,000
Evanston	WEHS	Victor C. Carlson	1,310 (229)	100
Galesburg	WKBS	Pernil N. Nelson	1,310 (229)	100
Do	WLBO	Frederick A. Trebbe, jr	1,310 (229)	100
Glenview [10]	WBBM	Atlass Co	770 (390)	10,000
	WJBT			
Harrisburg	WEBQ	First Trust & Savings Bank	1,210 (247.9)	50
Joliet	WCLS	W C L S, Inc	1,310 (229)	100
Do	WKBB	Sanders Bros	1,310 (229)	100
La Salle	WJBC	Hummer Furniture Co	1,200 (250)	100
Mooseheart	WJJD	Supreme Lodge, Loyal Order of Moose	1,130 (265.5)	2,000
				[5] 20,000
Mount Prospect [10]	WJAZ	Zenith Radio Corporation	1,480 (202.7)	5,000
Peoria Heights	WMBD	Peoria Heights Radio Laboratory	1,440 (208.3)	[1] 1,000
Quincy	WTAD	Illinois Stock Medicine Broadcasting Corporation.	1,440 (208.3)	[2] 500
Rockford	KFLV	A. T. Frykman	1,410 (212.8)	500
Rock Island	WHBF	Beardsley Specialty Co	1,210 (247.9)	100
Springfield	WCBS	Harold L. Dewing and Charles H. Messter	1,210 (247.9)	100
Streator	WTAX	Williams Hardware Co	1,210 (247.9)	100
Tuscola	WDZ	James L. Bush	1,070 (280.4)	50
Urbana	WILL	University of Illinois	890 (337)	100
				[1] 500
Zion	WCBD	Wilbur G. Voliva	1,080 (277.8)	[2] 250
Indiana:				5,000
Anderson	WHBU	Citizens Bank	1,210 (247.9)	100
Brookville	WKBV	Knox Battery & Electric Co	1,500 (200)	100
Culver	WCMA	Culver Military Academy	1,400 (214.3)	500
Evansville	WGBF	Evansville On The Air (Inc.)	630 (476)	500
Fort Wayne	WGL	Allen-Wayne Co	1,370 (219)	100
Do	WOWO	Main Auto Supply Co	1,160 (258.6)	5,000
Gary	WJKS	Johnson Kennedy Radio Corporation	1,360 (220.6)	[1] 1,250
				[2] 500
Hammond	WWAE	Hammond Calumet Broadcasting Co	1,200 (250)	100
Indianapolis (near)	WFBM	Indianapolis Power & Light Co	1,230 (243.9)	1,000
Indianapolis	WKBF	Noble B. Watson	1,400 (214.3)	500
Kokomo	WJAK	Marion Broadcast Co	1,310 (229)	50
Laporte	WRAF	The Radio Club	1,200 (250)	100
Muncie	WLBC	D. A. Burton	1,310 (229)	50
South Bend	WSBT	South Bend Tribune	1,230 (243.9)	500
Terre Haute	WBOW	Banks of Wabash Broadcasting Association	1,310 (229)	100

Broadcasting stations, alphabetically by States and cities—Continued

[See footnotes to this list on p. 24]

State and city	Call signal	Owner	Frequency in kilocycles, meters in parentheses	Power (watts)
Indiana—Continued.				
Valparaiso	WRBC	Immanuel Lutheran Church	1,240 (241.9)	500
West Lafayette	WBAA	Purdue University	1,400 (214.3)	500
Iowa:				
Ames	WOI	Iowa State College	560 (536)	3,500
Boone	KEGQ	Boone Biblical College	1,310 (229)	100
Cedar Rapids	KWCR	Harry F. Paar	1,310 (229)	100
Clarinda	KSO	A. A. Berry Seed Co	1,380 (217.4)	500
Council Bluffs	KOIL	Mona Motor Oil Co	1,260 (238.1)	[1] 2,500 [2] 1,000
Davenport	WOC	Palmer School of Chiropractic	1,000 (300)	5,000
Decorah	WKLC	Luther College	1,270 (236.2)	100
Do	KGCA	Charles W. Greenley	1,270 (236.2)	50
Des Moines	WHO	Bankers Life Co	1,000 (300)	5,000
Fort Dodge	KFJY	C. S. Tunwall	1,310 (229)	100
Iowa City	WSUI	State University of Iowa	580 (517)	500
Marshalltown	KFJB	Marshall Electrical Co	1,200 (250)	100
Muscatine	KTNT	Norman Baker	1,170 (256.4)	5,000
Ottumwa	WIAS	Poling Electric Co	1,420 (211.3)	100
Red Oak	KICK	Red Oak Radio Corporation	1,420 (211.3)	100
Shenandoah	KMA	May Seed & Nursery Co	930 (323)	[1] 1,000 [3] 500
Do	KFNF	Henry Field Seed Co	890 (337)	[1] 1,000 [2] 500
Sioux City	KSCJ	Sioux City Journal	1,330 (225.6)	1,000
Waterloo	WMT	Waterloo Broadcasting Co	1,200 (250)	[1] 250 [3] 100
Kansas:				
Concordia	KGCN	Concordia Broadcasting Co	1,420 (211.3)	50
Kansas City	WLBF	Everett L. Dillard	1,420 (211.3)	100
Lawrence	KFKU	University of Kansas	1,220 (245.9)	500
Do	WREN	Jenny Wren Co	1,220 (245.9)	1,000
Manhattan	KSAC	Kansas State Agricultural College	580 (517)	[1] 1,000 [3] 500
Milford	KFKB	KFKB Broadcasting Association	1,050 (285.7)	5,000
Topeka (near)	WIBW	Topeka Broadcasting Association	1,300 (230.8)	[1] 2,500 [2] 1,000
Wichita	KFH	Hotel Lassen	1,300 (230.8)	500
Kentucky:				
Hopkinsville	WFIW	Acme Mills	940 (319)	1,000
Jeffersontown [11]	WHAS	Courier-Journal & Louisville Times	820 (366)	5,000
Louisville	WLAP	American Broadcasting Corporation of Kentucky.	1,200 (250)	30
Louisiana:				
Cedar Grove [12]	KTSL	Bates Radio & Electric Co	1,310 (229)	50
Kennonwood [13]	KWKH	W. K. Henderson Iron Works & Supply Co.	850 (353)	5,000
New Orleans	WABZ	Coliseum Place Baptist Church	1,200 (250)	100
Do	WDSU	Uhalt Radio	1,270 (236.2)	1,000
Do	WJBO	Valdemar Jensen	1,370 (219)	100
Do	WJBW	C. Carlson, jr	1,200 (250)	130
Do	WSMB	Saenger Theatres, and Maison Blanche Co.	1,320 (227.3)	500
Do	WWL	Loyola University	850 (353)	500
Shreveport	KRMD	Robert M. Dean	1,310 (229)	50
Do	KSBA	S. R. Elliott & A. C. Steere	1,450 (206.9)	1,000
Do	KWEA	William E. Antony	1,210 (247.9)	100
Maine:				
Bangor	WABI	First Universalist Church	1,200 (250)	100
Do	WLBZ	Maine Broadcasting Co	620 (484)	[1] 500 [2] 200
Portland	WCSH	Congress Square Hotel Co	940 (319)	550
Maryland:				
Baltimore	WCAO	Monumental Radio (Inc.)	600 (500)	250
Do	WCBM	Baltimore Broadcasting Corporation	1,370 (219)	100
Do	WFBR	Baltimore Radio Show	1,270 (236.2)	250
Cumberland	WTBO	Cumberland Electric Co	1,420 (211.3)	50
Glen Morris [14]	WBAL	Consolidated Gas, Electric Light & Power Co.	1,060 (283)	10,000
Salisbury	WSMD	Tom F. Little	1,310 (229)	100
Massachusetts:				
Boston	WSSH	Tremont Temple Baptist Church	1,420 (211.3)	[1] 250 [2] 100
Do	WBZA	Westinghouse Electric & Manufacturing Co.	990 (303)	500
Do	WNAC WBIS	Shepard Norwell Co	1,230 (243.9)	500

Broadcasting stations, alphabetically by States and cities—Continued

[See footnotes to this list on p. 24]

State and city	Call signal	Owner	Frequency in kilocycles, meters in parentheses	Power (watts)
Massachusetts—Con.				
Boston	WEEI	Edison Electric Illuminating Co. of Boston	590 (509)	500
Do	WMES	Massachusetts Educational Society	1,500 (200)	50
Chelsea	WLOE	Boston Broadcasting Co	1,500 (200)	[1] 1,250 [2] 100
Dartmouth	WMAF	Round Hills Radio Corporation	1,360 (220.6)	500
Fall River	WSAR	Doughty & Welch Electrical Co	1,450 (206.9)	250
Gloucester	WEPS	Matheson Radio Co	1,200 (250)	100
Do	WHDH	do	830 (361)	1,000
Lexington	WLEY	Lexington Air Station	1,420 (211.3)	[1] 1,250 [2] 100
Lexington	WLEX	do	1,360 (220.6)	500
New Bedford	WNBH	New Bedford Broadcasting Co	1,310 (229)	100
Springfield [15]	WBZ	Westinghouse Electric & Manufacturing Co.	990 (303)	15,000
Webster	WKBE	K. & B. Electric Co	1,200 (250)	100
Wellesley Hills	WBSO	Babson's Statistical Organization	780 (385)	250
Worcester	WTAG	Worcester Telegram	580 (517)	250
Michigan:				
Battle Creek	WKBP	Battle Creek Enquirer and News	1,420 (211.3)	50
Berrien Springs	WEMC	Emmanuel Missionary College	590 (509)	1,000
Calumet	WHDF	Charles C. MacLeod	1,370 (219)	100
Detroit	WAFD	Albert B. Parfet Co	1,500 (200)	100
Do	WBMH	Braun's Music House	1,420 (211.3)	100
Do	WMBC	Michigan Broadcasting Co	1,420 (211.3)	100
Do	WWJ	Detroit News	920 (326)	1,000
East Lansing	WKAR	Michigan State College	1,040 (288.5)	500
Flint	WFDF	Frank D. Fallain	1,310 (229)	100
Fraser [16]	WGHP	American Broadcasting Corporation	1,240 (241.9)	750
Furnwood [17]	WOOD	Walter B. Stiles, jr	1,270 (236.2)	500
Grand Rapids	WASH	Baxter Laundries	1,270 (236.2)	250
Hampton Township [18]	WBCM	James E. Davidson	1,410 (212.8)	500
Jackson	WIBM	C. L. Carrell	1,370 (219)	100
Lapeer	WMPC	First Methodist Protestant Church	1,500 (200)	100
Ludington	WKBZ	Karl L. Ashbacker	1,500 (200)	50
Pontiac [19]	WCX, WJR	WJR (Inc.)	750 (400)	5,000
Royal Oak	WAGM	Robert L. Miller	1,310 (229)	50
Ypsilanti	WJBK	James F. Hopkins	1,370 (219)	50
Minnesota:				
Anoka [20]	WCCO	Washburn-Crosby Co	810 (370)	7,500
Collegeville	WFBJ	St. John's University	1,370 (219)	100
Fergus Falls	KGDE	Jaren Drug Co	1,200 (250)	50
Fridley	WRHM	Rosedale Hospital	1,250 (240)	1,000
Hallock	KGFK	Kittson County Enterprise	1,200 (250)	50
Minneapolis	WDGY	George W. Young	560 (536)	500
Do	WHDI	Wm. Hood Dunwoody Industrial Institute	560 (536)	500
Minneapolis [40]	WGMS, WLB	University of Minnesota	1,250 (240)	500
Northfield	KFMX	Carleton College	1,250 (240)	1,000
Do	WCAL	St. Olaf College	1,250 (240)	1,000
Westcott [21]	KSTP	National Battery Broadcasting Co	1,460 (205.5)	10,000
Mississippi:				
Columbus	WCOC	Crystal Oil Co	880 (341)	500
Greenville	WRBQ	J. Pat Scully	1,210 (247.9)	100
Gulfport	WGCM	Gulf Coast Music Co	1,210 (247.9)	100
Hattiesburg	WRBJ	Woodruff Furniture Co	1,500 (200)	10
Utica	WQBC	Utica Chamber of Commerce	1,360 (220.6)	300
Missouri:				
Cape Girardeau	KFVS	Hirsch Battery & Radio Co	1,210 (247.9)	100
Clayton	KFUO	Concordia Seminary	550 (545)	[1] 1,000 [2] 500
Columbia	KFRU	Stephens College	630 (476)	500
Independence	KMBC, KLDS	Midland Broadcasting Co	950 (316)	[1] 2,500 [2] 500
Jefferson City	WOS	Missouri State Marketing Bureau	630 (476)	[1] 1,000 [2] 500
Joplin	WMBH	Edwin D. Aber	1,420 (211.3)	[1] 250 [2] 100
Kansas City	KWKC	Wilson Duncan Studios	1,370 (219)	100
Do	WDAF	Kansas City Star	610 (492)	1,000
Do	WHB	Sweeney School Co	950 (316)	[1] 2,500 [2] 500
Do	WOQ	Unity School of Christianity	610 (492)	1,000
Kirksville	KFKZ	Northeast Missouri State Teachers College	1,200 (250)	15

Broadcasting stations, alphabetically by States and cities—Continued

[See footnotes to this list on p. 24]

State and city	Call signal	Owner	Frequency in kilocycles, meters in parentheses	Power (watts)
Missouri—Continued.				
Kirkwood [22]	KMOX KFQA	Voice of St. Louis	1,090 (275.2)	5,000
St. Joseph	KFEQ	Scroggin & Co. Bank	560 (536)	2,500
Do	KGBX	Foster-Hall Tire Co	1,370 (219)	100
St. Louis	KFWF	St. Louis Truth Center	1,200 (250)	100
Do	KSD	St. Louis Post Dispatch	550 (545)	500
Do	KWK	Greater St. Louis Broadcasting Corporation	1,350 (222.2)	1,000
Do	WEW	St. Louis University	760 (395)	1,000
Do	WMAY	Kingshighway Presbyterian Church	1,200 (250)	100
Do	WIL	Missouri Broadcasting Corporation	1,420 (211.3)	[1] 250 [2] 100
Montana:				
Billings	KGHL	Northwestern Auto Supply Co	950 (316)	500
Butte	KGIR	Symons Broadcasting Co	1,360 (220.6)	250
Great Falls	KFBB	Buttrey Broadcast (Inc.)	1,360 (220.6)	500
Kalispell	KGEZ	Flathead Broadcasting Association	1,310 (229)	100
Missoula	KGHD	Raymond S. Nash	1,420 (211.3)	50
Do	KUOM	University of Montana	570 (526)	500
Vida	KGCX	First State Bank of Vida	1,420 (211.3)	10
Nebraska:				
Clay Center	KMMJ	M. M. Johnson Co	740 (405)	1,000
Lincoln	KFAB	Nebraska Buick Auto Co	770 (390)	5,000
Do	KFOR	Howard A. Shuman	1,210 (247.9)	100
Lincoln (University Place).	WCAJ	Nebraskan Wesleyan University	590 (509)	500
Norfolk	WJAG	Norfolk Daily News	1,060 (283)	500
Omaha	WAAW	Omaha Grain Exchange	660 (455)	500
Do	WOW	Woodmen of the World Life Insurance Association.	590 (509)	1,000
Ravenna	KGFW	Otto F. Sothman	1,420 (211.3)	50
York	KGBZ	Dr. George R. Miller	930 (323)	[1] 1,000 [2] 500
Nevada: Reno	KOH	Jay Peters (Inc.)	1,370 (219)	100
New Hampshire:				
Laconia	WKAV	Laconia Radio Club	1,310 (229)	100
Tilton	WBRL	Booth Radio Laboratories	1,430 (209.8)	500
New Jersey:				
Asbury Park	WCAP	Radio Industries Broadcast Co	1,280 (234.4)	500
Atlantic City	WPG	Municipality of Atlantic City	1,100 (272.7)	5,000
Bound Brook [23]	WJZ	R. C. A	760 (395)	[3] 25,000 [4] 30,000
Camden	WCAM	City of Camden	1,280 (234.4)	500
Carlstadt [23]	WHAP	Defenders of Truth Society	1,300 (230.8)	1,000
Cliffside [23]	WCDA	Italian Education Broadcast Corporation	1,350 (222.2)	250
Do [23]	WPAP	Palisades Amusement Park	1,010 (297)	250
Do [23]	WQAO	Calvary Baptist Church	1,010 (297)	250
Coytesville [23]	WRNY	Experimenter Publishing Co	1,010 (297)	250
Elizabeth	WIBS	New Jersey Broadcasting Corporation	1,450 (206.9)	250
Englewood Cliffs	WHPP	Bronx Broadcasting Co	1,420 (211.3)	10
Fort Lee	WBMS	WBMS Broadcasting Corporation	1,450 (206.9)	250
Hoboken [23]	WMCA	Hotel McAlpin	570 (526)	500
Do [23]	WPCH	Eastern Broadcasters (Inc.)	810 (370)	500
Jersey City	WAAT	Bremer Broadcasting Corporation	1,070 (280.4)	300
Do	WKBO	Camith Corporation	1,450 (206.9)	250
Kearny [23]	WLWL	Missionary Society of St. Paul the Apostle	1,100 (272.7)	5,000
Do. [24]	WOR	L. Bamberger & Co	710 (423)	5,000
Newark	WAAM	WAAM (Inc.)	1,250 (240)	[1] 2,000 [2] 1,000
Do	WGCP	May Radio Broadcasting Corporation	1,250 (240)	250
Do	WNJ	Radio Investment Co	1,450 (206.9)	250
Paterson	WODA	O'Dea Temple of Music (Richard O'Dea)	1,250 (240)	1,000
Red Bank	WJBI	Robert S. Johnson	1,210 (247.9)	100
Secaucus [23]	WOV	International Broadcasting Corporation	1,130 (265.5)	1,000
Trenton	WOAX	Franklyn J. Wolff	1,280 (234.4)	500
New Mexico:				
Albuquerque	KGGM	Jay Peters	1,370 (219)	100
Raton	KGFL	N. L. Cotter	1,350 (222.2)	50
State College	KOB	New Mexico College of Agriculture	1,180 (254.2)	10,000
New York:				
Amherst [25]	WKBW	Churchill Evangelistic Association	1,470 (204.1)	5,000
Astoria [23]	WGBS	General Broadcasting System	1,180 (254.2)	500
Auburn	WMBO	Radio Service Laboratories	1,370 (219)	100
Bay Shore	WINR	Radiotel Manufacturing Co	1,210 (247.9)	100
Bellmore [23]	WEAF	National Broadcasting Co	660 (455)	[3] 25,000 [4] 50,000
Binghamton (near)	WNBF	Howitt-Wood Radio Co	1,500 (200)	50

Broadcasting stations, alphabetically by States and cities—Continued

[See footnotes to this list on p. 24]

State and city	Call signal	Owner	Frequency in kilocycles, meters in parentheses	Power (watts)
New York—Con.				
Brooklyn	WBBC	Brooklyn Broadcasting Corporation	1,400 (214.3)	500
Do	WLTH	Voice of Brooklyn (Inc.)	1,400 (214.3)	500
Do	WMBQ	Paul J. Gollhofer	1,500 (200)	100
Do	WSGH WSDA	Amateur Radio Specialty Co	1,400 (214.3)	500
Buffalo	WEBR	Howell Broadcasting Co	1,310 (229)	[1] 200 [2] 100
Do	WGR	Radio Station WGR (Inc.)	550 (545)	1,000
Do	WSVS	Seneca Vocational School	1,370 (219)	50
Canton	WCAD	St. Lawrence University	1,220 (245.9)	500
Cazenovia	WMAC	Clive B. Meredith	570 (526)	250
Coney Island (Brooklyn)	WCGU	U. S. Broadcast Corporation	1,400 (214.3)	500
Farmingdale	WLBH	Nassau Broadcasting Corporation	1,420 (211.3)	30
Freeport	WGBB	Harry H. Carman	1,210 (247.9)	100
Grand Island [25]	WKEN	Radio Station WKEN (Inc.)	1,040 (288.5)	1,000
Greenville [26]	WCOH	Westchester Broadcasting Corporation	1,210 (247.9)	100
Ithaca	WEAI	Cornell University	1,270 (236.2)	500
Do	WLCI	Lutheran Association of Ithaca, N. Y.	1,210 (247.9)	50
Jamaica	WMRJ	Peter J. Prinz	1,420 (211.3)	10
Jamestown	WOCL	A. E. Newton	1,210 (247.9)	25
Long Beach	WCLB	Arthur Faske	1,500 (200)	100
Long Island City	WLBX	John N. Brahy	1,500 (200)	100
Martinsville (near) [25]	WMAK	WMAK Broadcasting System	900 (333)	750
Mount Beacon [27]	WOKO	Harold E. Smith	1,440 (208.3)	500
New York	WBNY	Baruchrome Corporation	1,350 (222.2)	250
Do	WHN	Marcus Loew Booking Agency	1,010 (297)	250
Do	WKBQ	The Standard Cahill Co	1,350 (222.2)	250
Do	WMSG	Madison Square Garden Broadcast Corporation.	1,350 (222.2)	250
Do	WNYC	City of New York	570 (526)	500
Richmond Hill [23]	WABC WBOQ	Atlantic Broadcasting Corporation	860 (349)	5,000
Rochester	WHEC WABO	Hickson Electric Co	1,440 (208.3)	500
Do	WNBQ	Gordon P. Brown	1,460 (205.4)	15
Rossville	WBBR	Peoples Pulpit Association	1,300 (230.8)	1,000
Saranac Lake	WNBZ	Smith and Mace	1,290 (232.6)	10
Schenectady	WGY	General Electric Co	790 (380)	50,000
Syracuse	WFBL	The Onondaga Co	900 (333) 1,490 (201.3)	750 1,000
Do	WSYR	Clive B. Meredith	570 (526)	250
Troy	WHAZ	Rensselaer Polytechnic Institute	1,300 (230.8)	500
Tupper Lake	WHDL	George F. Bissell	1,420 (211.3)	10
Utica	WIBX	WIBX (Inc.)	1,200 (250)	[1] 300 [2] 100
Victor Township [28]	WHAM	Stromberg-Carlson Telephone Manufacturing Co.	1,150 (260.9)	5,000
Woodhaven [23]	WEVD	Debs Memorial Radio Fund	1,300 (230.8)	500
Woodside	WWRL	W. H. Reuman	1,500 (200)	100
North Carolina:				
Asheville	WWNC	Citizen Broadcasting Co	570 (526)	1,000
Charlotte	WBT	C. C. Coddington	1,080 (277.8)	1,000
Gastonia	WRBU	A. J. Kirby Music Co	1,210 (247.9)	100
Greensboro	WNRC	Wayne M. Nelson	1,440 (208.3)	500
Raleigh	WPTF	Durham Life Insurance Co	680 (441)	1,000
Wilmington	WRBT	Wilmington Radio Assoication	1,370 (219)	50
North Dakota:				
Bismarck	KFYR	Hoskins-Meyer (Inc.)	550 (545)	500
Devils Lake	KDLR	Radio Electric Co	1,210 (247.9)	100
Grand Forks	KFJM	University of North Dakota	1,370 (219)	100
Mandan	KGCU	Mandan Radio Assn	1,200 (250)	100
West Fargo	WDAY	WDAY (Inc.)	1,280 (234.4)	1,000
Ohio:				
Akron	WADC	Allen Theatre (Allen T. Simmons)	1,320 (227.3)	1,000
Do	WFJC	W. F. Jones Broadcasting (Inc.)	1,450 (206.9)	500
Bellefontaine	WHBD	First Presbyterian Church	1,370 (219)	100
Cambridge	WEBE	Roy W. Waller	1,210 (247.9)	100
Canton	WHBC	St. John's Parish	1,200 (250)	10
Cincinnati	WAAD	Ohio Mechanics Institute	1,420 (211.3)	25
Do	WFBE	Park View Hotel	1,200 (250)	100
Do	WKRC	Kodel Radio Corporation	550 (545)	500
Cleveland	WEAR	WEAR & WTAM (Inc.)	1,070 (280.4)	1,000
Do	WHK	Radio Air Service Corporation	1,390 (215.8)	[1] 2,000 [2] 1,000

Broadcasting stations, alphabetically by States and cities—Continued

[See footnotes to this list on p. 24]

State and city	Call signal	Owner	Frequency in kilocycles, meters in parentheses	Power (watts)
Ohio—Continued.				
Cleveland	WJAY	Cleveland Radio Broadcasting Corporation.	1,450 (206.9)	500
Do	WTAM	WTAM and WEAR (Inc.)	1,070 (280.4)	3,500
Columbus	WAIU	American Insurance Union	640 (469)	500
Do	WOAH	The Commercial Radio Service Co	1,430 (209.8)	250
Do	WEAO	Ohio State University	550 (545)	750
Do	WMAN	First Baptist Church (W. E. Heskett)	1,210 (247.9)	50
Dayton	WSMK	Stanley M. Krohn, jr	570 (526)	200
Hamilton	WRK	S. W. Doron and John C. Slade	1,310 (229)	100
Harrison [29]	WCKY	L. B. Wilson	1,480 (202.7)	5,000
Mansfield	WLBV	Mansfield Broadcasting Association	1,210 (247.9)	100
Mason [30]	WLW	Crosley Manufacturing Co	700 (429)	[3] 25,000 / [4] 50,000
Do.[30]	WSAI	Crosley Radio Corporation (lessee) (United States Playing Card Co.).	800 (375)	5,000
Middletown	WSRO	Harry W. Fahrlander	1,420 (211.3)	100
Springfield	WCSO	Wittenberg College	1,380 (217.4)	500
Steubenville	WIBR	Thurman A. Owings	1,420 (211.3)	50
Toledo	WSPD	Toledo Broadcasting Co	1,340 (223.9)	500
Youngstown	WKBN	Radio Electric Service Co	570 (526)	500
Oklahoma:				
Alva	KGFF	Earl E. Hampshire	1,420 (211.3)	100
Chickasha	KOCW	Oklahoma College for Women	1,420 (211.3)	100
Enid	KCRC	Champlin Refining Co	1,370 (219)	100
Norman	WNAD	University of Oklahoma	1,010 (297)	500
Oklahoma City	KFJF	National Radio Manufacturing Co	1,470 (204.1)	5,000
Do	KGFG	Faith Tabernacle Association	1,370 (219)	100
Oklahoma City	KFXR	Exchange Avenue Baptist Church	1,310 (229)	100
Oklahoma City (near).	WKY	WKY Radiophone Co	900 (333)	1,000
Picher	KGGF	Dr. D. L. Connell	1,010 (297)	500
Ponca City	WBBZ	C. L. Carrell	1,200 (250)	100
Tulsa (near)	KVOO	Southwestern Sales Corporation	1,140 (263.2)	5,000
Oregon:				
Astoria	KFJI	George Kincaid	1,370 (219)	50
Corvallis	KOAC	Oregon State Agricultural College	560 (536)	1,000
Eugene	KORE	Eugene Broadcast Station	1,420 (211.3)	100
Marshfield	KOOS	Harold H. Hanseth	1,370 (219)	50
Medford	KMED	Mrs. W. J. Virgin	1,310 (229)	50
Portland	KEX	Western Broadcasting Co	1,180 (254.2)	5,000
Do	KFEC	Meier & Frank Co	1,370 (219)	50
Do	KFIF	Benson Polytechnic Institute	1,420 (211.3)	100
Do	KFJR	Ashley C. Dixon & Son	1,300 (230.8)	500
Do	KGW	Portland Morning Oregonian	620 (484)	1,000
Do	KTBR	M. E. Brown	1,300 (230.8)	500
Do	KWBS	Schaeffer Radio Co	1,500 (200)	15
Do	KWJJ	Wilbur Jerman	1,060 (283)	500
Do	KXL	KXL Broadcasters	1,250 (240)	500
Sylvan [31]	KOIN	KOIN (Inc.)	940 (319)	1,000
Pennsylvania:				
Allentown	WCBA	B. Bryan Musselman	1,440 (208.3)	250
Do	WSAN	Allentown Call Publishing Co.	1,440 (208.3)	250
Altoona	WFBG	William F. Gable Co	1,310 (229)	100
Byberry [32]	WCAU	Universal Broadcasting Co	1,170 (256.4)	1,000
Carbondale	WNBW	Home Cut Glass & China Co	1,200 (250)	5
East Pittsburgh [33]	KDKA	Westinghouse Electric & Manufacturing Co.	980 (306)	[3] 25,000 / [4] 50,000
Elkins Park	WIBG	St. Paul's Protestant Episcopal Church	930 (323)	50
Erie	WEDH	Erie Dispatch Herald	1,420 (211.3)	30
Do	WRAK	C. R. Cummins	1,370 (219)	50
Frankford [32]	WFKD	Foulkrod Radio Engineering Co	1,310 (229)	50
Grove City	WSAJ	Grove City College	1,310 (229)	100
Harrisburg	WBAK	Pennsylvania State Police	1,430 (209.8)	500
Do	WPRC	Wilson Printing & Radio Co	1,200 (250)	100
Johnstown	WHBP	Johnstown Automobile Co	1,310 (229)	100
Kingston (Pringleboro).	WABF	Markle Broadcasting Corporation	1,460 (205.5)	250
Lancaster	WGAL	Lancaster Electric Supply & Construction Co.	1,310 (229)	15
Do	WKJC	Kirk Johnson & Co	1,200 (250)	100
Lemoyne	WMBS	Macks Battery Service	1,430 (209.8)	500
Lewisburg	WLBU	Bucknell University	1,210 (247.9)	100
Oil City	WLBW	Petroleum Telephone Co	1,260 (238.1)	500
Philadelphia	WABY	John Magaldi, jr	1,310 (229)	50
Do	WELK	Howard R. Miller	1,370 (219)	100
Do	WFAN	Keystone Broadcasting Co	610 (492)	500

Broadcasting stations, alphabetically by States and cities—Continued

[See footnotes to this list on p. 24]

State and city	Call signal	Owner	Frequency in kilocycles, meters in parentheses	Power (watts)
Pennsylvania—Contd.				
Philadelphia	WFI	Strawbridge & Clothier	560 (536)	500
Do	WHBW	D. R. Kienzle	1, 500 (200)	100
Do	WIP	Gimble Bros	610 (492)	500
Do	WLIT	Lit Bros	560 (536)	500
Do	WNAT	Lenning Bros. Co	1, 310 (229)	100
Do	WPSW	Philadelphia School of Wireless Telegraphy (J. C. Van Horn).	1, 500 (200)	50
Do	WRAX	Berachah Church	1, 020 (294.1)	250
Pittsburgh	KQV	Doubleday-Hill Electric Co	1, 380 (217.4)	500
Do	WCAE	Kaufman & Baer Co	1, 220 (245.9)	500
Do	WJAS	Pittsburgh Radio Supply House	1, 290 (232.6)	1, 000
Reading	WRAW	Avenue Radio & Electric Shop	1, 310 (229)	100
Scranton	WGBI	Scranton Broadcasters (Inc.)	880 (341)	250
Do	WQAN	Scranton Times	880 (341)	250
State College	WPSC	Pennsylvania State College	1, 230 (243.9)	500
Washington	WNBO	John B. Spriggs	1, 200 (250)	15
Wilkes-Barre	WBAX	John H. Stenger, jr	1, 210 (247.9)	100
Do	WBRE	Louis G. Baltimore	1, 310 (229)	100
Willow Grove	WALK	Albert A. Walker	1, 500 (200)	50
Wilkinsburg (Penn township). [33]	WMBJ	Rev. John W. Sproul	1, 500 (200)	100
Philippine Islands:				
Manila	KZIB	I. Beck (Inc.)	1, 153 (260)	20
Do	KZKZ	Electrical Supply Co	1, 110 (270.3)	100
Do	KZRM	Radio Corporation of the Philippines	726 (413)	1, 000
Porto Rico: San Juan	WKAQ	Radio Corporation of Porto Rico	890 (337)	500
Rhode Island:				
Cranston	WDWF / WLSI	Lincoln Studios and Dutee W. Flint	1, 210 (247.9)	100
Newport	WMBA	Le Roy J. Beebe	1, 500 (200)	100
Pawtucket	WPAW	Shartenberg & Robinson	1, 210 (247.9)	100
Providence	WEAN	Shepard Co	550 (545)	250
Do	WJAR	The Outlet Co	890 (337)	[5] 400 / 250
South Carolina:				
Columbia	WRBW	Paul S. Pearce		15
Charleston	WBBY	Washington Light Infantry	1, 200 (250)	75
South Dakota:				
Brookings	KFDY	South Dakota State College	550 (545)	500
Do	KGCR	Cutler's Radio Broadcasting Service	1, 210 (247.9)	100
Dell Rapids	KGDA	Home Auto Co. (J. R. Nelson)	1, 370 (219)	50
Oldham	KGDY	J. Albert Loesch	1, 200 (250)	15
Pierre	KGFX	Dana McNeil	580 (517)	200
Rapid City	WCAT	South Dakota State School of Mines	1, 200 (250)	100
Sioux Falls	KSOO	Sioux Falls Broadcast Assn	1, 110 (270.3)	2, 000
Vermilion	KUSD	University of South Dakota	890 (337)	[1] 750 / [2] 500
Yankton	WNAX	Gurney Seed and Nursery Co	570 (526)	1, 000
Tennessee:				
Chattanooga	WDOD	Chattanooga Radio Co	1, 280 (234.4)	500
Knoxville	WFBC	First Baptist Church	1, 200 (250)	50
Do	WNBJ	Lonsdale Baptist Church	1, 310 (229)	50
Do	WNOX	Sterchi Bros	560 (536)	1, 000
Lawrenceburg	WOAN	James D. Vaughn	600 (500)	500
Memphis	WGBC	First Baptist Church	1, 430 (209.8)	500
Do	WHBQ	Broadcasting Station WHBQ (Inc.)	1, 370 (219)	100
Do	WMBM	Seventh Day Adventist Church	1, 500 (200)	10
Do	WMC	Memphis Commercial Appeal	780 (385)	500
Do	WNBR	Popular Radio Shop (John Ulrich)	1, 430 (209.8)	500
Nashville	WBAW	Waldrum Drug Co	1, 490 (201.3)	5, 000
Do	WLAC	Life & Casualty Insurance Co	1, 490 (201.3)	5, 000
Do	WSM	National Life & Accident Insurance Co	650 (462)	5, 000
Springfield	WSIX	638 Tire & Vulcanizing Co	1, 210 (247.9)	100
Union City	WOBT	Tittsworth's Radio & Music Shop	1, 310 (229)	15
Whitehaven [34]	WREC	WREC (Inc.)	600 (500)	500
Texas:				
Abilene	KFYO	Kirksey Bros. Battery & Electric Co	1, 420 (211.3)	100
Amarillo	WDAG	J. Laurance Martin	1, 410 (212.8)	250
Do	KGRS	E. B. Gish	1, 410 (212.8)	1, 000
Austin	KUT	KUT Broadcasting Co	1, 120 (267.9)	500
Beaumont	KFDM	Magnolia Petroleum Co	560 (536)	500
Brownsville	KWWG	Chamber of Commerce	1, 260 (238.1)	500
Brownwood	KGKB	Eagle Publishing Co	1, 500 (200)	100
College Station	WTAW	Agricultural & Mechanical College	1, 120 (267.9)	500
Dallas	KRLD	KRLD Radio Corporation	1, 040 (288.5)	10, 000
Do	WFAA	Dallas News and Dallas Journal	1, 040 (288.5)	500
Do	WRR	City of Dallas	1, 280 (234.4)	500

Broadcasting stations, alphabetically by States and cities—Continued

[See footnotes to this list on p. 24]

State and city	Call signal	Owner	Frequency in kilocycles, meters in parentheses	Power (watts)
Texas—Continued.				
Dublin	KFPL	C. C. Baxter	1,310 (229)	10
El Paso	WDAH	Trinity Methodist Church (South)	1,310 (229)	105
Fort Worth	KFJZ	Henry Clay Allison	1,370 (219)	100
Do	KTAT	Texas Air Transport Broadcast Co	1,240 (241.9)	1,000
Do	WBAP	Carter Publications (Inc.)	800 (375)	10,000
Galveston	KFLX	George R. Clough	1,370 (219)	100
Do	KFUL	Will H. Ford	1,290 (232.6)	500
Greenville	KFPM	New Furniture Co	1,310 (229)	15
Harlingen	KRGV	Valley Radio Electric Corporation	1,260 (238.1)	100
Houston	KPRC	Post-Dispatch	920 (326)	1,000
Do	KTUE	Uhalt Electric	1,420 (211.3)	5
Richmond	KGHX	Fort Bend County School Board	1,500 (200)	50
San Angelo	KGFI	Eagle Broadcasting Co	1,310 (229)	15
Do	KGKL	KGKL (Inc.)	1,370 (219)	100
San Antonio	KGDR	KGDR Broadcasting Co	1,500 (200)	100
Do	KGCI	Liberty Radio Sales	1,370 (219)	100
Do	KTAP	Alamo Broadcasting Co	1,420 (211.3)	100
Do	KGRC	Eugene J. Roth	1,370 (219)	100
Do	KTSA	Lone Star Broadcast Co. (Inc.)	1,290 (232.6)	[1] 2,000 [2] 1,000
Do	WOAI	Southern Equipment Co	1,190 (252.1)	5,000
Waco	WJAD	Frank P. Jackson	1,240 (241.9)	1,000
Wichita Falls	KGKO	Wichita Falls Broadcasting Co	570 (526)	250
Utah:				
Ogden	KFUR	Peery Building Co	1,370 (219)	50
Salt Lake City	KDYL	Intermountain Broadcasting Corporation	1,290 (232.6)	1,000
Do	KSL	Radio Service Corporation of Utah	1,130 (265.5)	5,000
Vermont:				
Burlington	WCAX	University of Vermont	1,200 (250)	100
Springfield	WNBX	First Congregational Church	1,200 (250)	10
Virginia:				
Arlington	NAA	United States Navy	690 (435)	1,000
Chesterfield Hills	WTAZ	W. Reynolds, jr., and Thomas McGuire	1,360 (220.6)	15
Mount Vernon Hills.	WJSV	Independent Publishing Co	1,460 (205.5)	10,000
Newport News	WGH	Virginia Broadcasting Co	1,310 (229)	100
Norfolk	WBBW	Ruffner Junior High School	1,270 (236.2)	100
Do	WTAR WPOR	WTAR Radio Corporation	780 (385)	500
Petersburg	WLBG	R. A. Gamble	1,200 (250)	100
Do	WSEA	Virginia Beach Broadcasting Co	1,140 (263.2)	500
Richmond	WBBL	Grace Covenant Church	1,370 (219)	100
Do	WMBG	Havens & Martin	1,210 (247.9)	100
Do	WRVA	Larus & Bro. Co	1,110 (270.3)	1,000
Roanoke	WDBJ	Richardson-Wayland Electrical Corporation.	930 (323)	[1] 500 [2] 250
Washington:				
Aberdeen	KXRO	KXRO (Inc.)	1,420 (211.3)	75
Bellingham	KVOS	L. Kessler	1,200 (250)	100
Des Moines (near)[33]	KVI	Puget Sound Broadcasting Co	1,340 (223.9)	1,000
Everett	KFBL	Leese Bros	1,370 (219)	50
Lacey	KGY	St. Martins College	1,200 (250)	[1] 50 [2] 10
Longview	KUJ	Columbia Valley Broadcasting Co	1,500 (200)	10
Pullman	KWSC	State College of Washington	1,390 (215.8)	500
Seattle	KOL	Seattle Broadcasting Co	1,270 (236.2)	1,000
Do	KFQW	KFQW (Inc.)	1,420 (211.3)	100
Do	KJR	Northwest Radio Service Co	970 (309)	5,000
Do	KKP	City of Seattle, Harbor Department	1,370 (219)	15
Do	KOMO	Fisher's Blend Station	920 (326)	1,000
Do	KPCB	Pacific Coast Biscuit Co	1,210 (247.9)	100
Do	KPQ	Louis Wasmer and Archie Taft	1,210 (247.9)	100
Do	KRSC	Radio Sales Corporation	1,120 (267.9)	50
Do	KTW	First Presbyterian Church	1,270 (236.2)	1,000
Do	KVL	A. C. Dailey	1,370 (219)	100
Do	KXA	American Radio Telephone Co	570 (526)	500
Spokane	KFIO	North Central High School	1,230 (243.9)	100
Do	KFPY	Symons Broadcasting Co	1,390 (215.8)	500
Do	KGA	Northwest Radio Service Co	1,470 (204.1)	5,000
Do	KHQ	Louis Wasmer	590 (509)	1,000
Tacoma	KMO	KMO (Inc.)	1,340 (223.9)	500
West Virginia:				
Bluefield	WHIS	Daily Telegraph Printing Co	1,420 (211.3)	100
Charleston	WOBU	Charleston Radio Broadcasting Co	580 (517)	250
Fairmont	WMMN	Holt-Howe Novelty Co	890 (337)	[1] 500 [2] 250

Broadcasting stations, alphabetically by States and cities—Continued

State and city	Call signal	Owner	Frequency in kilocycles, meters in parenthesis	Power (watts)
West Virginia—Con.				
Huntington	WSAZ	McKeller Electric Co	580 (517)	250
Weirton	WQBZ	J. H. Thomspon	1,420 (211.3)	60
Wheeling	WWVA	West Virginia Broadcasting Corporation	1,160 (258.6)	250
Wisconsin:				
Beloit	WEBW	Beloit College	600 (500)	350
Brookfield [36]	WTMJ	Milwaukee Journal	620 (484)	[1] 2,500 [2] 1,000
Fond du Lac	KFIZ	Fond du Lac Commonwealth Reporter	1,420 (211.3)	100
Kenosha	WCLO	C. E. Whitmore	1,200 (250)	100
La Crosse	WKBH	Callaway Music Co	1,380 (217.4)	1,000
Madison	WHA	University of Wisconsin	570 (526)	750
Do	WIBA	Capital Times Studio and Strand Theater Corporation.	1,210 (247.9)	100
Manitowoc	WOMT	Mikadow Theater	1,210 (247.9)	100
Milwaukee	WHAD	Marquette University	1,120 (267.9)	250
Do	WISN	Evening Wisconsin Co	1,120 (267.9)	250
Poynette	WIBU	William C. Forrest	1,310 (229)	100
Racine	WRJN	Racine Broadcasting Corporation	1,370 (219)	100
Sheboygan	WHBL	Press Publishing Co. and C. L. Carrell	1,410 (212.8)	500
Stevens Point	WLBL	Wisconsin Department of Markets	900 (333)	2,000
Superior [37]	WEBC	Head of The Lakes Broadcasting Co	1,280 (234.4)	1,000
Washington Township. [38]	WTAQ	Gillette Rubber Co	1,330 (225.6)	500
West De Pere	WHBY	St. Norbert's College	1,200 (250)	100
Wyoming: Laramie	KWYO	N. S. Thomas	600 (500)	500
Portable: Nebraska	KGIF	Robert B. Howell	1,380 (217.4)	7½

[1] Day.
[2] Night.
[3] Normally.
[4] Experimentally.
[5] Temporarily.
[6] Studio at Hollywood.
[7] Studio at Pomona.
[8] Studio at Los Angeles.
[9] Studio at Bridgeport.
[10] Studio at Chicago.
[11] Studio at Louisville.
[12] Studio at Shreveport.
[13] Additional studios at Shreveport.
[14] Studio at Baltimore.
[15] Studio at Boston.
[16] Studio at Detroit.
[17] Studio at Grand Rapids.
[18] Studio at Bay City.
[19] Studio at Detroit.
[20] Studio at Minneapolis-St. Paul.
[21] Studio at St. Paul.
[22] Studio at St. Louis.
[23] Studio at New York, N. Y.
[24] Studio at Newark.
[25] Studio at Buffalo.
[26] Studio at Yonkers.
[27] Studio at Poughkeepsie.
[28] Studio at Rochester.
[29] Studio at Covington, Ky.
[30] Studio at Cincinnati.
[31] Studio at Portland.
[32] Studio at Philadelphia.
[33] Studio at Pittsburgh.
[34] Studio at Memphis.
[35] Studio at Tacoma.
[36] Studio at Milwaukee.
[37] Studio at Duluth.
[38] Studio at Eau Claire.
[39] Construction permit issued.
[40] This signal assigned for use of Washburn-Crosby Co. when transmitting through WLB.

MEDICAL ADVICE FURNISHED SHIPS AT SEA BY STATIONS OF THE TROPICAL RADIO TELEGRAPH CO. AND AFFILIATED COMPANIES

The following is a list of radio stations of the United Fruit Co. and affiliated companies through which medical service may be obtained without charge, so far as these companies are concerned, by ships of all nationalities:

Station	Call signal	Owner
Boston, Mass	WBF	Tropical Radio Telegraph Co
Miami, Fla	WAX	Do.
New Orleans, La	WNU	Do.
Fort Morgan, Ala	WIO	Do.
Mobile, Ala	WNN	Do.
Tegucigalpa, Honduras	UG [1]	Do.
Puerto Barrios, Guatemala	UF [1]	Do.
Managua, Nicaragua	UL [1]	Do.
Bluefields, Nicaragua	UQ [1]	Do.
Cape Gracias, Nicaragua	UW [1]	Do.
Preston, Cuba	CME	Do.
Santa Marta, Colombia	UJ [1]	United Fruit Co.
Puerto Limon, Costa Rica	UX [1]	Do.
Almirante, Panama	RXA	Do.
Tela, Honduras	UC [1]	Tela Railroad Co.
Puerto Castilla, Honduras	UA [1]	Truxillo Railroad Co.
Puerto Armuelles, Panama	RXB	Chiriqui Land Co.

[1] Call letters subject to change in near future to comply with international regulations.

Radiograms requesting medical advice should be signed by the captain of the ship and should state briefly, but clearly, the symptoms of the person afflicted. Such radiograms, if intended for a United Fruit Co. hospital, should be addressed "Unifruitco," followed by the name of the place where the hospital is located. United Fruit Co. hospitals giving this service are located at the following points and may be reached through any of the above-mentioned radio stations: Santa Marta, Colombia; Puerto Limon, Costa Rica; Almirante, Panama; Preston, Cuba; and Puerto Barrios, Guatemala. The Tela Railroad Co. hospital is located at Tela, Honduras, and may be reached by calling "Telarailco Tela." The Truxillo Railroad Co. maintains a hospital at Puerto Castilla, Honduras, for which point messages should be addressed "Trurailco Castilla."

The Miami and New Orleans stations of the Tropical Radio Telegraph Co. are in a position to render medical advice through their connections with hospitals in those cities. Messages for Miami should be addressed to the radio station there, and those for New Orleans should be addressed "Unifruitco Neworleans."

All United Fruit Co. passenger steamships carry doctors, and free medical advice may be secured by radio from any of them by a radiogram addressed "Ship's Doctor," followed by the name of the steamship. This free medical service is established primarily for the benefit of ships not carrying doctors. However, should occasion require, ships' doctors may hold consultation by radio with the United Fruit Co. ships' doctors and hospital staffs.

The physicians and surgeons comprising the medical staff of the United Fruit Co. and its associated companies are thoroughly qualified, but in view of the fact that radio medical advice to ships at sea is given free and without an opportunity for a personal examination of the patients, no responsibility will be assumed by either the United Fruit Co. and its associated companies or the physicians or surgeons giving the advice as to its accuracy or for error or delay in the receipt or transmission of any message sent or received in connection therewith.

It is requested that when sending medical advice radiograms, radio operators check them "(number of words) Dh Medico."

"Dh Medico" radiograms will be given preference over all other radiograms, except S O S calls, throughout the radio service of the United Fruit Co. and affiliated companies.

RADIOBEACON ESTABLISHED AT PORQUEROLLES, HYERES ISLANDS LIGHTHOUSE, FRANCE

Location, long. 6° 12′ E., lat. 42° 59′ N. (approximately).
Fy., 285 (1,050); type A2.
Characteristic, transmits every minute, as follows:

— · — — · — — · —	—— etc.
10 seconds	30 seconds
— · — — · — — · —	Silent
10 seconds	10 seconds

During fog five successive repetitions of the above signal are transmitted, commencing at the 10th, 20th, 30th, 40th, 50th, and 60th minutes of each hour.

RADIOBEACON AT BOULOGNE, SOUTHWEST JETTY LIGHTHOUSE, CHANGED

Location, long. 1° 35′ E., lat. 50° 44′ N. (approximately).
Fy., 285 (1,050); type, A2.
Characteristic, transmits during fog continuously every minute, as follows:

— · · · — · · · — · · · — · · ·	—— etc.
10 seconds	30 seconds
— · · · — · · · — · · · — · · ·	Silent
10 seconds	10 seconds

RADIO-COMPASS STATION ESTABLISHED AT TARIFA, STRAIT OF GIBRALTAR, SPAIN

This station is located near the lighthouse in approximate latitude 5° 36′ 24″ W., longitude 36° 00′ 00″ N. Call signal EBQ.

MEDICAL ADVICE FURNISHED BY BRITISH STATIONS

Medical advice can be obtained from any coast station in the British Isles by addressing a radiogram to the station concerned. The station will communicate the message to the appropriate medical authority, whose reply will be signaled to the ship. In case a doctor from shore is wanted, the request for such assistance should be addressed as a radiogram to the medical officer of the most convenient port. The cost of messages will be debited to the ship.

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

United States, October 8, 1928.
Canada, October 29, 1928.
Netherlands, October 29, 1928.
Dutch East Indies, October 29, 1928.
Surinam, October 29, 1928.
Curacao, October 29, 1928.
Norway, October 29, 1928.
Denmark, November 15, 1928.
Belgium, December 15, 1928.
Belgian Congo and the Mandate Territory of Ruanda-Urundi administratively united with the Belgian Congo, December 15, 1928.
Great Britain, December 29, 1928.
British India, December 29, 1928.
Austria, December 29, 1928.
Irish Free State, January 14, 1929.
Italy, January 18, 1929.
Finland, January 24, 1929.
Japan, January 31, 1929.
Spain, January 31, 1929.
Spanish Colony of the Gulf of Guinea, January 31, 1929.
Union of South Africa, January 31, 1929.
New Zealand, February 7, 1929.

The Department of State is advised that the convention, general regulations, and supplementary regulations have been ratified also by Morocco, Hungary, Sweden, Portugal, and Czechoslovakia. It is expected that the ratifications of these Governments will be deposited at an early date. The United States and Canada ratified only the convention and the general regulations.

USES OF RADIO AS AN AID TO AIR NAVIGATION

In a paper which appeared in the February, 1929, issue of the Journal of the American Institute of Electrical Engineers, entitled "Uses of Radio as an Aid to Air Navigation," by Dr. J. H. Dellinger, chief of the radio section of the Bureau of Standards, the use of radio for guiding airplanes along fixed airways during fog or other conditions of low visibility is the principal topic. Various direction-finding methods are discussed. A description is given of the directive radiobeacon system, together with a receiving system which shows on the instrument board the location of the airplane with respect to a course marked out in space. Methods of air navigation on other than established courses are also discussed as well as other applications, such as field localizing methods and communication between the airplane and the ground.

NOTE ON A PIEZO-ELECTRIC GENERATOR FOR AUDIO-FREQUENCIES

Plates of cystalline quartz can be made to vibrate by electrical means and have been used in this way for some time in piezooscillators as standards of radio-frequency. To produce an audio-frequency directly by means of a piezo-

oscillator would require a very large quartz plate if the "Curie cut" were used. An audio-frequency may be produced by using two radio-frequency piezo-oscillators the frequencies of which differ slightly and furnish a beat or difference frequency which lies within the limits of audibility. A description of apparatus for obtaining audio-frequencies by this method is contained in "Note on a Piezo-Electric Generator for Audio-Frequencies," by A. Hund, Research Paper No. 40, Bureau of Standards Journal of Research, February, 1929. Copies of this paper may be obtained for 5 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C.

RADIO SIGNAL TRANSMISSIONS OF STANDARD FREQUENCY, MARCH TO JULY, 1929

The Bureau of Standards announces a new schedule of radio signals of standard frequencies for the public in calibrating frequency standards and transmitting and receiving apparatus. This schedule includes many of the border frequencies between services as set forth in the allocation of the International Radio Convention at Washington, which went into effect January 1, 1929. The signals are transmitted from the bureau's station WWV, Washington, D. C. They can be heard and utilized by stations equipped for continuous-wave reception at distances up to 1,000 miles from the transmitting station.

The transmissions are by continuous-wave radio telegraphy. The modulation which was previously on these signals has been eliminated. A complete frequency transmission includes a "general call" and "standard frequency" signal, and "announcements." The "general call" is given at the beginning of the 8-minute period and continues for about 2 minutes. This includes a statement of the frequency. The "standard frequency signal" is a series of very long dashes with the call letter (WWV) intervening. This signal continues for about 4 minutes. The "announcements" are on the same frequency as the "standard frequency signal" just transmitted and contain a statement of the frequency. An announcement of the next frequency to be transmitted is then given. There is then a 4-minute interval while the transmitting set is adjusted for the next frequency.

Information on how to receive and utilize the signals is given in Bureau of Standards Letter Circular No. 171, which may be obtained by applying to the Bureau of Standards, Washington, D. C. Even though only a few frequency points are received, persons can obtain as complete a frequency meter calibration as desired by the method of generator harmonics, information on which is given in the letter circular. The schedule of standard frequency signals is as follows:

Radio transmissions of standard frequency schedule of frequencies, in kilocycles

Eastern standard time (p. m.)	Mar. 20	Apr. 22	May 20	June 20	July 22
10 to 10.08	1,500	4,000	125	550	1,500
10.12 to 10.20	1,700	4,500	150	600	1,700
10.24 to 10.32	2,250	5,000	200	700	2,000
10.36 to 10.44	2,750	5,500	250	800	2,300
10.48 to 10.56	2,850	6,000	300	1,000	2,700
11 to 11.08	3,200	6,500	375	1,200	3,100
11.12 to 11.20	3,500	7,000	450	1,400	3,500
11.24 to 11.32	4,000	7,300	550	1,500	4,000

REFERENCES TO CURRENT RADIO LITERATURE

This is a monthly list of references prepared by the Bureau of Standards and is intended to cover the more important papers of interest to professional radio engineers which have recently appeared in periodicals, books, etc. The number at the left of each reference classifies the reference by subject, in accordance with the scheme presented in "A Decimal Classification of Radio Subjects—An Extension of the Dewey System," Bureau of Standards Circular No. 138, a copy of which may be obtained for 10 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C. The various articles listed below are not obtainable from the Government. The various periodicals can be secured from their publishers and can be consulted at large public libraries.

R000.—*Radio communication*

R007 The problem of international distribution of broadcast wave lengths: Proposals of the Polish Broadcasting Co. Experimental Wireless and Wireless Engineer (London), **6,** pp. 3-8; January, 1929.

Deals with European situation.

R010 Zenneck, J. The importance of radiotelegraphy in science. Proc. Inst. of Radio Engrs., **17,** pp. 89-114; January, 1929.

A history of the progress of the art is given.

R020 Hund, A. Hochfrequenz-Messtechnik. (High-frequency measurements.) (Book.) 2d edition, 1928. Published by J. Springer, Berlin. Noted in Experimental Wireless and Wireless Engineer (London), **5,** p. 22; January, 1929.

Review of book.

R090 Important events in radio—peaks in the waves of wireless progress—1928. Radio Service Bulletin, No. 141; pp. 16-26; December, 1928.

R100.—*Radio principles*

R113 Barfield, R. H., and Munro, G. H. The attenuation of wireless waves over towns. Experimental Wireless and Wireless Engineer (London), **6,** pp. 31-37; January, 1929.

Experimental and theoretical discussion of attenuation of radio waves over towns and suburbs. The absorption over towns is mostly due to buildings, vertical metal conductors, etc., and the absorption due to receiving stations plays only a small part, while over suburbs the absorption is mostly due to receiving stations.

R113 Quäck, E., and Mögel, H. Hörbarkeitsgrenzen und güngstigste Verkehrszeiten bei Kurzwellen auf den einzelnen Überseelinien. (Audibility limits and most favorable communication directions for short waves over certain transoceanic paths.) Elektrische Nachrichten Technik, **5,** pp. 542-549; December, 1928.

The charts given refer to a range of 30,000 to 7,500 kilocycles. For 24 hours of service one day and one night frequency are usually sufficient. For certain directions a third wave is needed. If the rays of the sun are perpendicular to certain portions of the transmission path while the entire path is exposed to daylight, the reception is rather poor.

R113.1 Colwell, R. C. Fading curves and weather conditions. Proc. Inst. of Radio Engrs., **17,** pp. 143-148; January, 1929.

Sunset fading curves from KDKA made at Morgantown, W. Va., with a Shaw recorder during April and May, 1927, showed that the signal strength from KDKA during the night was sometimes below and sometimes above daylight strength. Apparent correlation with weather.

R113.3 Duckert, P. Elektrische Schwingungen und ihre Grenzgebiete drahtlose Telegraphie—Über Fehlweisung der Funkpeilung in Äbhangigkeit von Wetterlage. (Electric waves and their limited transmission: On direction shift due to weather). Zeits. für Technische Physik, **9,** pp. 466-469; No. 12, 1928.

Experiments carried on during several years (day measurements) show that the power received from a transmitter passes over a curved instead of a straight horizontal path, so that the direction finder may be in error by several degrees. This is true when certain weather conditions exist, so-called atmospheric border layers. During the night the direction deviations are also accompanied by fading.

R113.4 Echos von Hertzschen Wellen (Echoes from electro-magnetic waves). Elektrische Nachrichten Technik, **5,** p. 488; December, 1928.

Gives the different suppositions which may explain the echo effects. One explanation (Lassen and Försterling) assumes that the rays travel along different paths in the ionized layer. The second explanation (Störmer) assumes reflections or refractions on the envelope of electron pockets of very great dimensions. The third explanation (B. van der Pol, jr.) assumes that the group velocity of the waves through the ionized layer can be slowed down considerably for certain conditions in the layer. The fourth explanation has reference to echoes corresponding to 0.005 to 0.08 second intervals, such as observed by Taylor and Young, Hoag and Andrew, and Quäck and Mögel. They are due to reflections from a layer 1,500 kilometers above the earth, from the polar night-light zone, or from the sunset shadow wall.

R113.4 Försterling, K. Über die Ausbreitung Kürzer elektromagnetischer Wellen in der Heavisideschicht. (On the propagation of short electromagnetic waver in the Heaviside layer). Elektrische Nachrichten Technik, **5,** pp. 530-542; December, 1928.

General discussion on the refraction and absorption of short waves (less than 60 meters). Assumes that the ionization is due to ultra-violet rays from the sun. The article also indicates that there can be three layers from which the atmospheric ray may descend.

R113.4 Appleton, E. V. Some notes on wireless methods of investigating the electrical structure of the upper atmosphere. Proc. Phys. Soc. (London), **41,** pp. 43-59; December 15, 1928.

Comparison of the wave length change method, angle of incidence method, and the group retardation method for finding the effective height of the Kennelly-Heaviside layer. If the effect of the earth's magnetic field is neglected, the methods measure the same equivalent height which is greater than the maximum height reached by the atmospheric ray. A method for investigating the ionic concentration is given. This is partly based on an assumption by Pedersen for which the angle of incidence at the ground is greater than 30°.

R113.5 Wright, C. S. Radio communication and magnetic disturbances. Nature (London), **122,** p. 961; December 22, 1928.

Note on the effect of magnetic disturbances on radio reception for frequencies greater than 150 kilocycles for crystal reception.

R113.5 Chapman, S. The ultra-violet light of the sun as the origin of auroræ and magnetic storms (letter). Nature (London), **122,** p. 921; December 3, 1928.

Refers to the letter by H. B. Maris and E. O. Hulburt (Nature, **24,** 1924) on their theory of auroræ and magnetic storms. This theory assumes that occasional sudden blasts of ultra-violet light produce the auroræ and magnetic storms. Chapman expects to offer another theory of the magnetic disturbances, which will assume the cause due to a neutral ionized stream (F. A. Linderman's original suggestion) which will avoid some of the inconsistencies of the Maris and Hulburt theory.

R114 Kenrick, G. W. The analysis of irregular motions with applications to the energy frequency spectrum of static and telegraph signals. Philosophical Magazine (London), **7,** pp. 176–196; January, 1929.

The analysis shows that the energy contained within a frequency band of given width due to an atmospheric disturbance produced by a random sequence of pulses varies directly with the square of the wave length. A numerical example shows that the energy due to pulses of the order of 10^{-4} second in duration and sharply rising exponential form can produce appreciable fields (since proportional to the square roots of the energies) on the longer wave lengths.

R124 von Ardenne, M. Einige Messungen über die Hochfrequenzspannungen an der Eingangsseite von Empfängern. (Some measurements on r. f. voltages induced in coil antennas). Zeits. für Hochfrequenztechnik, **32,** pp. 199–202; December, 1928.

An aperiodic high-frequency amplifier of known amplification inserted between the coil antenna and a tube voltmeter in order to bring the sensitiveness of the tube voltmeter to the proper value. Applications to field intensity measurements on broadcast stations are given.

R125.1 Smith-Rose, R. L. The reversibility of radio direction finders and local error at rotating loop beacon. Jour. Inst. of Elec. Engrs. (London), **67,** pp. 149–156; January, 1929.

It is shown that transmission from a rotating loop beacon being received on an open antenna produces about the same kind of errors as those experienced when the antenna is employed for transmitting to a direction finder. Methods are given for eliminating local errors.

R125.6 Meissner, A., and Rothe, H. On the determination of the optimum radiation angle for horizontal antennas. Proc. Inst. of Radio Engrs., **17,** pp. 35–41; January, 1929.

The most favorable radiation angle for 15 and 20 meter wave lengths was determined using horizontal multiple antennas in connection with a parabolic reflector. It was found that the most favorable radiation happened when it took place along the tangent of the surface of the earth.

R132 Colebrook, F. M. A generalized analysis of the triode valve equivalent network. Jour. Inst. of Elec. Engrs. (London), **67,** pp. 157–169; January, 1929.

Analytical treatment (graphical) of a vacuum-tube amplifier. It is based on Miller's assumptions (Bureau of Standards, vol. 15, p. 367; 1919) with modifications due to Hartshorn (Proc. Phys. Soc., London, vol. 39, p. 108, 1926–1927). One conclusion is that at very high radio frequencies the voltage amplification factor may apparently exceed the voltage factor of the tube if a pure inductive plate load is provided.

R132 **Forstmann, A., and Schramm, E.** Ueber Maximalleistungen von Verstärkerröhren. (On the maximum output of electron-tube amplifiers). Zeits. für Hochfrequenztechnik, **32,** pp. 195–199; December, 1928.

Formulas are derived for optimum output of vacuum tubes which are loaded either by a resistance or by an inductance. It is shown that for a constant plate potential and a resistance load the ratio of external to internal resistance is smaller than unity.

R132 Snavely, B. L., and Webb, J. S. Radio-frequency amplifying circuits. Proc. Inst. of Radio Engrs., **17,** pp. 118–126; January, 1929.

An equation is developed showing relation between circuit constants and critical grid resistance in a resistance stabilized amplifier having a tuned-grid circuit and a pure inductance plate load.

R133 Kohl, K. Über kurze ungedämpfte elektrische Wellen. (On short sustained electromagnetic waves). Zeits. für Technische Physik, **9,** pp. 472–473; No. 12, 1928.

The author attributes the frequency of ultra short waves in the Barkhausen-Kurz circuit partially to the natural frequency of an ordinary oscillating circuit. The frequency is increased on account of the dielectric constant of the electron gas between the grid and the anode, since this constant is smaller than unity. The frequency is therefore not due to a pure electronic oscillation.

R133 Edgeworth, E. Frequency variation of the triode oscillator (letter). Philosophical Magazine (London), **7,** pp. 200–203; January, 1929.

Further discussion on D. F. Martyn's paper (Phil. Mag., November, 1927) with reference to the paper by E. Edgeworth in Jour. Inst. of Elec. Engrs., wireless section, January 6, 1926.

R134 Terman, F. E., and Googin, T. M. Detection characteristics of 3-element vacuum tubes. Proc. Inst. of Radio Engrs., **17,** pp. 149–160; January, 1929.

Comparative tests of different tubes using grid detection.

R144 Butterworth, S. The high frequency resistance of toroidal coils. Experimental Wireless and Wireless Engr. (London), **6,** pp. 13–16; January, 1929.

A discussion of the toroid coil in comparison to a single layer solenoid. It is shown that although the toroid has the advantage of being astatic it has always more high frequency resistance than a properly designed single layer coil, and that the best possible toroid has more than twice as great a high frequency resistance as an equally compact single layer coil

R148 van der Pol, B. Some remarks on ultra short wave broadcasting. Experimental Wireless and Wireless Engrs. (London), **6,** pp. 9–12; January, 1929.

Theory of pure amplitude modulation showing that for ordinary short wave transmitters a frequency modulation due to the resistance of the oscillator occurs in addition, and that this interference can be avoided by using a piezoelectric controlled oscillator.

R200.—*Radio measurements and standardization*

R210 Hitchcock, R. C. A direct reading radio-frequency meter. Proc. Inst. of Radio Engrs., **17,** pp. 24–34; January, 1929.

A new type of direct reading r. f. meter.

R210 Pierce, G. W. Magnetostriction oscillators. Proc. Inst. of Radio Engrs., **17,** pp. 42–88; January, 1929.

Use of magnetostriction to produce and control electrical and mechanical frequencies of oscillations in a range of frequencies extending from a few hundred cycles per second to more than 300,000 cycles per second. Methods of calibration of vibrators and their use in the calibration of frequency meters and other data pertaining to such oscillators are given.

R214 Gerth, F., and Rochow, H. Die Temperaturäbhangigkeit der Frequenz des Quarzresonators. (The temperature dependence of the frequency of quartz resonators). Elektrische Nachrichten Technik, **5,** pp. 549–551; December, 1928.

Measurements of the absolute temperature coefficient of a quartz plate gave a value of 60 parts in 1,000,000 per degree centigrade. This figure was found for a temperature variation of 10 to 25° C. The quartz plate was silvered, and determination is independent of the crystal holder.

R214 Wright, J. W. The piezoelectric crystal oscillator. Proc. Inst. of Radio Engrs., **17,** pp. 127–142 January, 1929.

Theory and operation of the piezooscillator.

R220 Wilmotte, R. M. A quick and sensitive method of measuring condenser losses at radio frequencies. Jour. Scientific Instruments (London), **5,** pp. 369–377; December, 1928.

The substitution method for measuring the effective condenser resistance has been improved by employing proper screening. Curves for several air condensers are given. The method can be used from up to approximately 6,000 kilocycles.

R220 Weihe, W. Die Messung von Kapazitäten mit dem Ueberlagerungsverfahren. (The measurement of capacities with the heterodyne principle). Zeits. für Hochfrequenztechnik, **32,** pp. 185–194; December, 1928.

A beat-note method using the silent zone is employed for measuring the effective grid-filament capacity for different external anode resistances (for 2,000 to 10,000 kilocycles).

R300.—*Radio apparatus and equipment*

R334 Westman, H. P. UV-861, a screen-grid tube for the high-power amateur transmitter. QST, **13,** pp. 41–43; February, 1929.

Characteristics of tube.

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