

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

RADIO SERVICE BULLETIN

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ABBREVIATIONS AND SYMBOLS

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

- Name = Name of station.
- Loc. = Geographical location: W = west longitude, N = north latitude, S = south latitude, E = east longitude.
- Call = Call signal (letters) assigned.
- Type = Type of wave classified as follows: A1 = continuous wave (tube), A arc = continuous wave, A2 = interrupted continuous wave, A3 = phone, B = spark.
- Fy. = Frequency in kilocycles; normal frequency in italics; wave length in meters in parentheses.
- Power = Height (meters) of antenna and intensity of current (meter-amperes) at its base (sample of manner in which published—100/100) or the normal radiated power expressed in meter-amperes (sample of manner in which published—100 m. amp.).
- Service = Nature of service maintained: PG = general public (ship to shore), PR = limited public (limited to public, correspondence between fixed stations), P = private (limited commercial and special), O = Government business exclusively.
- Class = FX = fixed station (point-to-point service), RG = radio-compass station, FA = aeronautical station, AB = aviation beacon, RF = circular radiobeacon, B = ship station, FC = coast station, A = aircraft.
- Hours = Hours of operation: N = continuous service, X = no regular hour, Y = sunrise to sunset.
- Accts. = Message accounts settled by.
- M. R. T. Co. = Mackay Radio & Telegraph Co.
- R. C. A. = Radio Corporation of America.
- R. M. C. A. = Radiomarine Corporation of America.
- T. R. T. Co. = Tropical Radio Telegraph Co.
- C. w. = Continuous wave.
- I. c. w. = Interrupted continuous wave.
- A. C. = Alternating current.
- V. t. = Vacuum tube.
- M. a. = Meter-amperes.
- U. S. L. = Applies only to the list of Commercial and Government Radio Stations of the United States.
- △ = 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, 1931, and to the International List of Fixed and Land Stations, published by the Berne bureau]

Station	Class	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Licensee
Eastern Air Transport (Inc.)-Aeronautical Radio (Inc.) (general call for any of all stations).	FA, FX	WEAT	-----	-----	-----	Aeronautical Radio (Inc.).
Bakersfield, Calif. ¹	FX	KGPS	2,416 (124.17)-----	P	N	City of Bakersfield (police station).
Boston, Mass., radiotelephone. ²	FC	WOU	2,566 (116.91)-----	PG	N	New England Telephone & Telegraph Co.
Brownsville, Tex. ³	FA, FX	KGUE	2,326 (128.97), 2,344 (127.98), 3,238 (92.84), 3,244 (92.47), 3,452 (86.9), 3,460 (86.7), 3,468 (86.5), 3,484 (86.1), 4,140 (72.46), 5,600 (53.57), 5,630 (53.29), 6,260 (47.92), 6,275 (47.8).	P	X	Aeronautical Radio (Inc.).
Chicago, Ill. (municipal airport). ⁴	FA	WUCG	3,160 (94.9), 3,166 (94.75), 3,172 (94.67), 3,178 (94.39), 5,570 (53.86), 5,660 (53).	P	X	Do.
Dayton, Ohio. ⁵	FX	WPDM	2,416 (124.17)-----	P	N	City of Dayton, police department.
Des Moines, Iowa. ⁶	FX	KGTV	1,662 (180.51)-----	P	N	State of Iowa, bureau of investigation (police station).
Fort Worth, Tex. (Meacham Field) KGVI. ⁷	FA, FX	KGVI	3,160 (94.9), 3,166 (94.75), 3,172 (94.67), 3,178 (94.39), 5,570 (53.86), 5,660 (53).	P	X	Aeronautical Radio (Inc.).
Miami, Fla. (municipal airport). ⁸	FA, FX	WEEM	2,964 (101.21), 4,164 (72.04), 5,840 (51.36), 6,320 (47.46).	P	X	Do.
Moline, Ill. (airport). ⁹	FA, FX	WNAU	3,160 (94.9), 3,166 (94.75), 3,172 (94.67), 3,178 (94.39), 5,570 (53.86), 5,660 (53).	P	X	Do.
Oklahoma City, Okla. (municipal airport). ¹⁰	FA, FX	KNAV	-----do-----	P	X	Do.
Salt Lake City, Utah. ¹¹	FX	KGPW	2,470 (121.5)-----	P	N	Salt Lake City Corporation (police station).
Tulsa, Okla. (municipal airport). ¹²	FA, FX	KNAU	3,160 (94.9), 3,166 (94.75), 3,172 (94.67), 3,178 (94.39), 5,570 (53.86), 5,660 (53).	P	X	Aeronautical Radio (Inc.).

¹ Loc. (approximate) 119° 00' 00" W, 85° 30' 22" N.; type, A3.

² Type, A3.

³ Loc., 97° 28' 04" W., 28° 54' 49" N.; type, A1, A2, A3.

⁴ Loc. (approximate) 87° 46' 00" W., 41° 48' 00" N.; type, A1, A2, A3.

⁵ Loc. (approximate) 97° 37' 00" W., 41° 35' 00" N.; type, A3.

⁶ Loc. (approximate) 97° 21' 00" W., 32° 49' 00" N.; type, A1, A2, A3.

⁷ Loc., 80° 18' 54" W., 28° 50' 53" N.; type, A1, A2, A3.

⁸ Loc., 90° 30' 18" W., 41° 27' 06" N.; type, A1, A2, A3.

⁹ Loc., 97° 34' 48" W., 35° 26' 36" N.; type, A1, A2, A3.

¹⁰ Loc., 110° 54' 00" W., 40° 46' 04" N.; type, A3.

¹¹ Loc., 95° 54' 00" W., 36° 11' 26" N.; type, A1, A2, 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, 1931, and to the International List of Ship Stations, published by the Berne bureau]

Name of vessel	Call signal	Rates, all services (cents)	Service	Hours	Owner	Message account settled by—
American Importer (R. C.) ¹	WGEG	8	PG	X	United States Lines (Inc.)	R. M. C. A.
O'Brien Brothers ²	KURT	8	PG	X	O'Brien Brothers Dredging Corporation.	Do.
Suralleo ³	KDBS	8	PG	X	Submarine Boat Corporation.	Do.
Vigilant ⁴	KOZP	8	PG	X	City Mill Co.	Owner
Whitespray (R. C.)	WGEF	8	PG	X	Robert N. Piechaty	Do.

¹ Type, A1, A2; fy., 143 (2,100), 151 (1,985), 153 (1,960), 157 (1,910), 160 (1,875), 375 (800), 400 (750), 425 (705), 468 (640), 500 (600), 8,290 (36.19), 8,450 (35.5), 11,050 (27.15), 11,110 (27), 13,240 (22.66).

² Type, A2; fy., 375 (800), 425 (705), 468 (640), 500 (600).

³ Type, B; fy., 375 (800), 410 (730), 425 (705), 454 (660), 500 (600).

⁴ Type, B; fy., 375 (800), 425 (705), 500 (600).

Commercial aircraft stations, alphabetically, by names of craft

[Additions to the List of Radio Stations of the United States, edition of June 30, 1931, and to the International List of Aircraft Stations published by the Berne bureau]

Station	Call signal	Frequency, in kilocycles, meters in parentheses	Service	Hours	License
Eastern Air Transport (Inc.), Aeronautical Radio (Inc.) (general call for any or all stations).	WEAT				Aeronautical Radio (Inc.).
NC-80V ¹ (American Clipper).	KHAMN	333 (900), 500 (600), 3,070 (97.71), 3,076 (97.5), 5,690 (52.72), 8,650 (34.68).	P	X	Pan American Airways (Inc.).
NC-397H ¹	KHYAZ	333 (900), 500 (600), 1,688 (177.72), 3,070 (97.71), 5,690 (52.72), 8,650 (34.68).	P	X	Pan American-Grace Airways (Inc.).
NC-400H ¹	KHYBY	do	P	X	Do.
NC-402H ¹	KHYCX	do	P	X	Do.
NC-403H ¹	KHYDW	do	P	X	Do.
NC-6853 ¹	KHYEV	do	P	X	Do.
NC-7455 ¹	KHYFU	do	P	X	Do.
NC-8039 ¹	KHYGT	do	P	X	Do.
NC-8416 ¹	KHYHS	do	P	X	Do.
NC-8417 ¹	KHYIR	do	P	X	Do.
NC-8485 ²	KHXBY	do	P	X	Do.
NC-9424 ¹	KHYMN	333 (900), 500 (600), 1,688 (177.72), 3,070 (97.71), 5,690 (52.72), 8,650 (34.68).	P	X	American Airways (Inc.). Pan American-Grace Airways (Inc.).
NC-9666	KHDIR	do	P	X	Transcontinental & Western Air (Inc.).
NC-9715 ¹	KHYJQ	333 (900), 500 (600), 1,688 (177.72), 3,070 (97.71), 5,690 (52.72), 8,650 (34.68).	P	X	Pan American-Grace Airways (Inc.).
NC-9717 ¹	KHYKP	do	P	X	Do.
NC-9723 ¹	KHYLO	do	P	X	Do.
NC-9798 ¹	KHYNM	do	P	X	Do.
S-40	KHANM	333 (900), 500 (600), 3,070 (97.71), 3,076 (97.5), 5,690 (52.72), 8,650 (34.68).	P	X	Pan American Airways (Inc.).

¹ Type, A1.

² Type, A3.

Government land stations, alphabetically, by names of stations

[Addition to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1931, and to the International List of Fixed and Land Stations published by the Berne bureau]

Station	Class	Call signal	Frequency, in kilocycles, meters in parentheses	Service	Hours	Owner
Akron, Ohio (ninth district U. S. N. R.).	FX	NID		0	X	U. S. Navy.

Government ship stations, alphabetically, by names of stations

[Additions to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1931, and to the International List of Fixed and Land Stations published by the Berne bureau]

Station	Call signal	Frequency, in kilocycles, meters in parentheses	Service	Hours	Owner
Republic (RC).....	WUAM	153 (1,960), 159 (1,885), 396 (760), 428 (700), 4,255 (70.51), 8,510 (35.25), 12,765 (23.5), 17,020 (17.626).	O	X	U. S. Army.

Government aircraft stations, alphabetically, by names of craft

[Additions to the List of Radio Stations of the United States, edition of June 30, 1931, and to the International List of Aircraft Stations published by the Berne bureau]

Station	Call signal	Frequency, in kilocycles, meters in parentheses	Hours	Owner
NS-1Y.....	KHRWD	3,106 (96.59), 3,160 (94.9), 5,940 (50.47), 3,370 (88.97).	-----	Department of Commerce, Bureau of Lighthouses, Airways Division.
NS-2Y.....	KHRXCdo.....	-----	Do.

Marine radiobeacon stations

[Addition to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1931, and to the International List of Stations Performing Special Services, published by the Berne bureau]

POINT JUDITH LIGHT STATION, R. I.—Loc., 71° 29' 00'' W., 41° 22' 00'' N.; transmits every 180 seconds, groups of 1 dash and 2 dots for 60 seconds, silent 120 seconds, thus:

— . . — . .
60 seconds

Silent
120 seconds

Fy., 285 (1,053); hours, transmits daily in clear weather from 3 to 6 a. m., and 8 to 11 p. m., and continuously during thick or foggy weather (75th meridian time).

ANACAPA ISLAND LIGHT STATION, CALIF.—Loc., 119° 21' 44'' W., 34° 00' 57'' N.; transmits groups of 1 dash, 2 dots and 1 dash, (— . . —); fy., 304 (987); hours, operates continuously during thick or foggy weather from 10 to 15, 25 to 30, 40 to 45, and from 55 to 60 minutes after each hour, and daily in clear weather from 10 to 15 and from 40 to 45 minutes after each hour (one hundred and twentieth meridian time).

Commercial and Government land, ship, aircraft, radiobeacon, and direction-finding stations, alphabetically by call signals

Call signal	Name of station	Call signal	Name of station
KDBS	Suralco..... b	KHYKP	NC-9717..... a
KGFS	Bakersfield, Calif..... fx	KHYLO	NC-9723..... a
KGPV	Des Moines, Iowa..... fx	KHYMN	NC-9724..... a
KGPW	Salt Lake City, Utah..... fx	KHYNM	NC-9798..... a
KGUE	Brownsville, Tex..... fa, fx	KNAU	Tulsa, Okla. (municipal airport)..... fa, fx
KGUI	Fort Worth, Tex..... fa, fx (Meacham Field)	KNAV	Oklahoma City, Okla. (municipal airport)..... fa, fx
KHAMN	NC-80V..... a	KOZP	Vigilant..... b
KHANM	S-40 (American Clipper)..... a	KURT	O'Brien Brothers..... b
KHDIR	NC-9666..... a	NID	Akron, Ohio (ninth district U. S. N. R.)..... fx
KHRWD	NS-1Y..... a	WEAT	Eastern Air Transport (Inc.) (Aeronautical Radio (Inc.) general call for any or all stations)..... a, fa, fx
KHRXC	NS-2Y..... a	WEEM	Miami, Fla. (municipal airport)..... fa, fx
KHXBY	NC-8485..... a	WGEF	Whitespray..... b
KHYAZ	NC-397H..... a	WGEH	American Importer..... b
KHYBY	NC-400H..... a	WGEW	Moline, Ill. (airport)..... fa, fx
KHYCX	NC-402H..... a	WNAU	Boston, Mass., radiotelephone..... fc
KHYDW	NC-403H..... a	WOU	Dayton, Ohio..... fx
KHYEV	NC-8553..... a	WPDM	Republic..... b
KHYFU	NC-7455..... a	WUAM	Chicago, Ill. (municipal airport)..... fa
KHYGT	NC-8039..... a	WUCG	
KHYHS	NC-8416..... a		
KHYIR	NC-8417..... a		
KHYJQ	NC-9715..... a		

Experimental stations, alphabetically, by names of stations

[Additions to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1931]

Station	Call signal	Frequency in kilocycles, meters in parentheses	Power (watts)	License and post-office address
New Jersey: Camden.....	W3XAI	23,100 (12.99), 25,700 (11.67), 26,000 (11.54), 27,100 (11.07), 34,600 (8.67), 41,000 (7.32), 51,400 (5.83), 60,000 (5), 400,000 (.75), 401,000 (.74), and above.	500	RCA Victor Co. (Inc.)
Holmdel.....	W2XN	1,604 (187.03), 2,398 (125.1), 3,256 (92.5), 4,795 (62.57), 6,425 (46.7), 8,650 (34.63), 12,850 (23.35), 17,300 (17.341), 23,100 (12.99), 25,700 (11.67), 26,000 (11.54), 27,100 (11.07), 34,600 (8.67), 41,000 (7.32), 51,400 (5.83), 60,000 (5), 400,000 (.75) and above 401,000 (.74).	1,000	Bell Telephone Laboratories (Inc.)
New York: Le Roy.....	W8XAC	60,000 (5) to 100,000 (3).....	1	John J. Long, Jr., 63 Sonora Parkway, Brighton, N. Y.
New York.....	W2XDU	23,100 (12.99), 25,700 (11.67), 26,000 (11.54), 27,100 (11.07), 34,600 (8.67), 41,000 (7.32), 51,400 (5.83), 60,000 (5), 400,000 (.75), 401,000 (.74).	1,000	Atlantic Broadcasting Corporation, 485 Madison Avenue.
Do.....	W2XDV	do.....	50	Do.

Relay broadcasting stations, alphabetically, by names of stations

[Additions to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1931]

Station	Call signal	Frequency, in kilocycles, meters in parentheses	Power (watts)	Owner
<i>Portable</i>				
New York: New York..	W2XDZ	1,544 (194.3), 2,476 (121.16).....	50	Atlantic Broadcasting Corporation, 485 Madison Ave.
Wisconsin: Milwaukee.....	W9XAC	2,368 (126.68), 1,564 (191.82).....	50	Journal Co. (Milwaukee Journal).
Do.....	W9XAD	do.....	7.5	Do.

Visual broadcasting stations, alphabetically, by names of stations

[Additions to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1931]

Station	Call signal	Frequency, in kilocycles, meters in parentheses	Power (watts)	Owner
California: Bakersfield...	W6XAH	2,000 (150) to 2,100 (142.9).....	1,000	Pioneer Mercantile Co., 1526 Twentieth St.
Los Angeles..	W6XAO	43,000 (6.97) to 46,000 (6.52), 48,500 (6.18) to 60,300 (5.96), 60,000 (5) to 80,000 (3.75)	150	Don Lee (Inc.), 1,076 West Seventh St.

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

Call signal	District and station	Call signal	District and station
W2XDU W2XDV W2XDZ W2XN W3XAI	Second district: New York, N. Y. Do. New York, N. Y. (portable). Holmdel, N. J. Third district: Camden, N. J.	W6XAH W6XAO W8XAC W9XAC W9XAD	Sixth district: Bakersfield, Calif. Los Angeles, Calif. Eighth district: Le Roy, N. Y. Ninth district: Milwaukee, Wis. (portable). 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, 1931, and to the International List of Fixed and Land Stations, published by the Berne bureau]

- AUBURN, N. Y.—Fy., strike out 1,712 (175.23), add 2,458 (122.05).
 BOLINAS, CALIF. (KET).—Type, add A2, A3; power, 15 to 150/100.
 BUFFALO, N. Y. (municipal airport).—Power, 18/3.
 CHICAGO, ILL. (municipal airport).—Power, 18/3.
 CINCINNATI, OHIO (Lunken Field).—Fy., add 3,484 (86.1), 4,915 (61.03); power, 18/3.
 COLUMBUS, OHIO (municipal airport).—Call changed to WHG.
 DALLAS, TEX. KVP.—Type, strike out A2, add A3.
 HARRISBURG, PA. WBA.—Power, 42/7.
 HOUSTON, TEX. (municipal airport).—Type, add A2, A3; fy., add 3,238 (92.64), 3,244 (92.47), 3,452 (86.9), 3,460 (86.7), 3,468 (86.5), 3,484 (86.1), 5,600 (53.57), 5,630 (53.29).
 INDIANAPOLIS, IND. WAEA.—Call changed to WHM.
 JACKSON, MISS.—Fy., add 3,238 (92.64), 3,244 (92.47), 3,452 (86.9), 3,460 (86.7), 3,468 (86.5), 5,600 (53.57).
 JACKSONVILLE, FLA.—Power, 18/3.
 KAHUKU, HAWAII KQH.—Fy., strike out 19,020 (15.773), add 15,985 (18.767).
 MEMPHIS, TENN. (municipal airport).—Power, 18/3.
 MINNEAPOLIS, MINN. KQP.—Fy., add 3,112 (96.4), 4,116 (72.88), 5,525 (54.29).
 NASHVILLE, TENN.—Power, 18/3.
 PASCO, WASH.—Type, add A1, A2; power, 18/3.
 REDDING, CALIF. (municipal airport).—Type, add A1, A2; fy., add 5,570 (53.86).
 ROCKY POINT, N. Y. WDA.—Fy., strike out 9,480 (31.65), add 6,732.5 (44.56).
 ROCKY POINT, N. Y. WKW.—Fy., strike out 15,445 (19.423), add 19,020 (15.773).
 ST. LOUIS, MO. KGVX.—Fy., add 3,112 (96.4), 4,116 (72.88), 5,525 (54.29), 6,515 (46.05).
 SALT LAKE CITY, Utah KGTH.—Fy., strike out 6,380 (47.02), add 6,350 (47.24).
 SAN ANTONIO, TEX. (Winburn Field).—Type, add A2, A3; fy., add 3,238 (92.64), 3,244 (92.47), 3,452 (86.9), 3,460 (86.7), 3,468 (86.5), 3,484 (86.1), 5,600 (53.57), 5,630 (53.29).
 SCARBORO, ME.—Power, 7.53/.25.
 SHREVEPORT, LA.—Power, 18/3.
 TULSA, OKLA. KGPO.—Power, 28.8/2.35.
 WACO, TEX. (municipal airport).—Type, add A2, A3; fy., 3,238 (92.64), 3,244 (92.47), 3,452 (86.9), 3,460 (86.7), 3,468 (86.5), 3,484 (86.1), 5,600 (53.57), 5,630 (53.29).
 Strike out all particulars of the following-named stations: Aurora, Ill.; New Brunswick, N. J. WAY; San Juan, P. R. WGZ.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY, BY NAMES OF VESSELS

[Alterations and corrections to be made to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1931, and to the International List of Ship Stations, published by the Berne bureau]

- ANNETTA.—Owner, Newbalt S. S. Corporation.
 ARA.—Fy., strike out 153 (1,960), 155 (1,935), 159 (1,885), 410 (730), 454 (660), 468 (640), 5,525 (54.3), 5,555 (54), 8,290 (36.19), 11,050 (27.15), 11,110 (27), 11,230 (26.71).
 ARIZPA.—Accts., M. R. T. Co.; owner, Waterman S. S. Co.
 BENSON FORD.—Accts., Ford Motor Co.
 BORINGUEN.—Fy., add 159 (1,885), 410 (730), 454 (660); power, 25/15.
 BUTTERCUP.—Fy., strike out 500 (600); accts., Ford Motor Co.
 CALICHE.—Owner, Motorship Caliche Corporation.
 CITY OF ALMA.—Accts., M. R. T. Co.; owner, Waterman S. S. Corporation.
 CITY OF HAVRE.—Fy., add 468 (640); hours, strike out X, add N.
 DAYLIGHT.—Fy., strike out 159 (1,885), add 454 (660).
 EASTERN STAR.—Type, add B; fy., strike out 159 (1,885), add 355 (845).
 FLORIDA.—Power, 20/5.
 GATEWAY CITY.—Accts., M. R. T. Co.; owner, Waterman S. S. Corporation.
 GIELOW.—Name changed to Kenkora II; owner, Kenneth G. Smith.
 GORGONA.—Type, strike out B, add A2; fy., strike out 425 (705), add 410 (730), 460 (650).

- GUARDIAN.—Type, strike out B, add A1, A2; fy., add 400 (750), 468 (640), 5,525 (54.3), 5,555 (54), 6,590 (45.52), 6,605 (45.42), 8,290 (36.19), 8,450 (35.5), 11,050 (27.15), 11,110 (27), 13,240 (22.66), 16,580 (18.094), 16,660 (18.007), 22,100 (13.575), 22,220 (13.501).
- GUINEVERE.—Fy., strike out 425 (705).
- HENRY FORD II.—Accts., Ford Motor Co.
- HERBERT HOOVER.—Type, A1, A2; fy., 229 (1,310); power, 16/5; service, P; hours, X; accts., Inland Waterways Corporation.
- HUSSAR.—Accts., E. F. Hutton.
- IOLANDA.—Fy., strike out 159 (1,885).
- IONA.—Name changed to Stormy Petrel.
- KENOWIS.—Accts., M. R. T. Co.; owner, Waterman S. S. Corporation.
- LAKE GILTEDGE.—Owner, Anthony J. McAllister.
- LUSITANIA.—Fy., add 16,580 (18.940), 16,660 (18.007).
- MANOA.—Accts., Matson Navigation Co.
- MESSENGER.—Type, A1, A2; fy., 5,525 (54.3), 5,555 (54), 8,290 (36.19).
- NEW BRITAIN.—Owner, American Diamond Lines (Inc.).
- PIPESTONE COUNTY.—Power, 24/20.
- QUISTCONCK.—Accts., R. M. C. A.
- RELIANCE.—Owner, Reliance Fishing Co. (Inc.).
- SAN JOSE.—Hours, strike out N, add X.
- STAR OF HOLLAND.—Power, 33/4.
- SUNUGENTCO.—Owner, Portland California S. S. Co.
- TAMPICO.—Power, 10/4.
- TAVERNILLA.—Type, strike out B, add A2; fy., add 700 (430), 800 (375).
- THALIA.—Fy., strike out 159 (1,885).
- TIVIVES.—Fy., add 155 (1.935), 5,525 (54.3), 6,635 (45.21), 8,450 (35.5), 11,050 (27.15), 11,230 (26.71), 13,240 (22.66), 16,580 (18.094).
- WESTERN WAVE.—Fy., strike out 159 (1,885).
- WEST GAMBO.—Accts., R. M. C. A.
- WEST KYSKA.—Accts., M. R. T. Co.; owner, Waterman S. S. Corporation.
- WEST MODUS.—Accts., R. M. C. A.
- YAKA.—Accts., M. R. T. Co.; owner, Waterman S. S. Corporation.
- Strike out all particulars of the following-named stations: Chahunta, Colraine, Dodeca, Edward G. Suebert, Herman F. Whiton, Ilder, Indiana WPCZ, Mid-West, Relay, Republic WTCW, Rose City, Santa Ana, State of Virginia, Sujameco.

COMMERCIAL AIRCRAFT STATIONS, ALPHABETICALLY, BY NAMES OF CRAFT

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1931, and to the International List of Aircraft Stations, published by the Berne bureau]

- C-413E.—Licensee, National Air Transport (Inc.).
- C-415E.—Licensee, National Air Transport (Inc.).
- NC-11Y.—Fy., add 3,182.5 (94.26).
- NC-144M.—Licensee, Pan American-Grace Airways (Inc.).
- NC-185H.—Type, add A1; fy., strike out 375 (800), 393 (765), 400 (750), 414 (725), 420 (715), 457 (655), 1,624 (185), 2,344 (128), 3,106 (96.59); licensee, Eastern Air Transport (Inc.).
- NC-191E.—Fy., add 3,182.5 (94.26).
- NC-215M.—Fy., strike out 3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,173 (94.39), 5,570 (53.86), 5,660 (53), add 3,070 (97.71), 3,076 (97.5), 3,082 (97.33), 3,088 (97.15), 5,510 (54.45), 5,540 (54.15); licensee, Western Air Express.
- NC-300N.—Licensee, Pan American-Grace Airways (Inc.).
- NC-311N.—Fy., add 3,182.5 (94.26).
- NC-369N.—Fy., add 3,182.5 (94.26).
- NC-411H.—Fy., add 3,182.5 (94.26).
- NC-413H.—Fy., add 3,182.5 (94.26).
- NC-414E.—Fy., add 3,182.5 (94.26).
- NC-417E.—Fy., add 3,182.5 (94.26).
- NC-420H.—Fy., add 3,182.5 (94.26).
- NC-423E.—Fy., add 3,182.5 (94.26).
- NC-424E.—Fy., add 3,182.5 (94.26).
- NC-425E.—Fy., add 3,182.5 (94.26).
- NC-426H.—Fy., add 3,182.5 (94.26).
- NC-427H.—Fy., add 3,182.5 (94.26).
- NC-430H.—Type, add A1, A3; fy., add 3,106 (96.59).
- NC-436H.—Fy., add 3,182.5 (94.26).

- NC-489E.—Fy., add 3,106 (96.59), 3,238 (92.64), 3,244 (92.47), 3,452 (86.9), 3,460 (86.7), 3,468 (86.5), 4,915 (61.03), 5,600 (53.57); licensee, American Airways (Inc.).
- NC-581K.—Licensee, American Airways (Inc.).
- NC-585N.—Fy., strike out 3,070 (97.71), 3,076 (97.5), 5,690 (52.72), add 2,964 (101.21), 5,840 (51.36).
- NC-586N.—Fy., strike out 3,070 (97.71), 3,076 (97.5), 5,690 (52.72), add 2,964 (101.21), 5,840 (51.36).
- NC-588N.—Fy., strike out 3,070 (97.71), 3,076 (97.5), 5,690 (52.72), add 2,964 (101.21), 5,840 (51.36).
- NC-589N.—Fy., strike out 3,070 (97.71), 3,076 (97.5), 5,690 (52.72), add 2,964 (101.21), 5,840 (51.36).
- NC-600V.—Fy., strike out 3,070 (97.71), 3,076 (97.5), 5,690 (52.72), add 2,964 (101.21), 5,840 (51.36).
- NC-601V.—Fy., strike out 3,070 (97.71), 3,076 (97.5), 5,690 (52.72), add 2,964 (101.21), 5,840 (51.36).
- NC-626V.—Fy., strike out 3,070 (97.71), 3,076 (97.5), 5,690 (52.72), add 2,964 (101.21), 5,840 (51.36).
- NC-651E.—Licensee, American Airways (Inc.).
- NC-652E.—Licensee, American Airways (Inc.).
- NC-725K.—Fy., strike out 3,070 (97.71), 3,076 (97.5), 5,690 (52.72), add 2,964 (101.21), 5,840 (51.36).
- NC-726K.—Fy., strike out 3,070 (97.71), 3,076 (97.5), 5,690 (52.72), add 2,964 (101.21), 5,840 (51.36).
- NC-727K.—Fy., strike out 3,070 (97.71), 3,076 (97.5), 5,690 (52.72), add 2,964 (101.21), 5,840 (51.36).
- NC-728K.—Fy., strike out 3,070 (97.71), 3,076 (97.5), 5,690 (52.72), add 2,964 (101.21), 5,840 (51.36).
- NC-784Y.—Fy., add 1,688 (177.72).
- NC-800E.—Licensee, American Airways (Inc.).
- NC-801E.—Licensee, American Airways (Inc.).
- NC-802E.—Licensee, American Airways (Inc.).
- NC-804E.—Licensee, American Airways (Inc.).
- NC-805E.—Licensee, American Airways (Inc.).
- NC-880E.—Licensee, American Airways (Inc.).
- NC-881E.—Licensee, American Airways (Inc.).
- NC-945M.—Licensee, Pan American-Grace Airways (Inc.).
- NC-985H.—Fy., add 3,182.5 (94.26).
- NC-985V.—Fy., strike out 3,070 (97.71), 3,076 (97.5), 5,690 (52.72), add 2,964 (101.21), 5,840 (51.36).
- NC-8414.—Fy., add 3,182.5 (94.26).
- NC-8415.—Fy., add 3,182.5 (94.26).
- NC-8486.—Licensee, American Airways (Inc.).
- NC-9166.—Licensee, American Airways (Inc.).
- NC-9167.—Licensee, American Airways (Inc.).
- NC-9169.—Licensee, American Airways (Inc.).
- NC-9663 (Naugatuck).—Licensee, American Airways (Inc.).
- NC-9668.—Fy., add 3,182.5 (94.26).
- NC-9677 (Nonawtum).—Licensee, American Airways (Inc.).
- NC-9669.—Fy., add 3,182.5 (94.26).
- NC-9681 (Nemissa).—Licensee, American Airways (Inc.).
- NC-9716.—Licensee, American Airways (Inc.).
- NR-496M.—Fy., strike out 333 (900), add 11,050 (27.15).
- Strike out all particulars of the following-named stations: AF-32, NC-86K, NC-107H, NC-109H, NC-110H, NC-132H, NC-133H, NC-134H, NC-147H, NC-182H, NC-358M (The New Arbella), NC-397E (NAT No. 85), NC-417Y, NC-421H (NAT No. 93), NC-599N, NC-812H, NC-7117, NC-7119, NC-7582, NC-9144, NC-9608, NC-9609, NC-9735, NC-9751, NC-9780, NC-9809 (Travel Air), NR-105W (Winnie-Mae).

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, 1931, and to the International List of Fixed and Land Stations, published by the Berne bureau]

AUGUSTA, ME. (first district, U. S. N. R.).—Read Portland, Me. (first district U. S. N. R.).

STATIONS TRANSMITTING TIME SIGNALS

[Alterations and corrections to be made to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1931, and to the International List of Stations Performing Special Services, published by the Berne bureau]

WASHINGTON, D. C. (Annapolis, Md.) NSS.—signals on 8,030 (37.34) now sent at 0255-0300, 0755-0800, 2,355-2400 G. C. T.; also on 12,045 (24.81) at 1,655-1700 G. C. T.

STATIONS TRANSMITTING WEATHER REPORTS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1931, and to the International List of Aircraft Stations, published by the Berne bureau]

SAN JUAN, P. R.—local weather at 0400 G. C. T., change to 0430 G. C. T.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY, BY NAMES OF STATIONS

[Alterations and corrections to be made to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1931, and to the International List of Ship Stations, published by the Berne bureau]

Strike out all particulars of the following-named stations: Cambrai, CG-166, Newport, Somme.

GOVERNMENT AIRCRAFT, STATIONS ALPHABETICALLY, BY NAMES OF CRAFT

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1931, and to the International List of Aircraft Stations, published by the Berne bureau]

Strike out all particulars of the following-named stations: NS-4E, NS-7.

MARINE RADIOBEACON STATIONS

[Alterations and corrections to be made to the List of Commercial and Government Radio Stations of the United States, edition of June 30, 1931, and to the International List of Stations Performing Special Services, published by the Berne bureau]

COLUMBIA RIVER LIGHTSHIP, OREG.—Hours, clear weather operating period changed to the third fifteen minutes of each hour.

CAPE SPENCER LIGHTHOUSE, ALASKA.—Hours, strike out present operating time, add will be operated continuously during thick or foggy weather and daily in clear weather from 20th to 30 and 50th to 60th minutes after each hour.

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

KGWJ, *read* Kenkora II; NDR, *read* Portland, Me. (First District U. S. N. R.); WAEA, call changed to WHM; WAEB, call changed to WHG; WFEH, *read* Stormy Petrel; strike out all particulars following the call signals, KDLE, KHFEV, KHFHs, KHGcX, KHGDW, KHGEV, KHGFU, KHGGT, KHGHs, KHGIR, KHGJQ, KHGKP, KHGLO, KHGMN, KHGNM, KHGOL, KHIAZ, KHIIQ, KHIKP, KHMAZ, KHMBY, KHMCMX, KHNGT, KHNSH, KHRDW, KHRWD, KHRXC, KHSBY, KHSHS, KHWHs, KOML, NENQ, NRJX, WAY, WFDG, WGDT, WGZ, WHDW, WKDF, WLCO, WLCR, WNCY, WPBU, WPCZ, WQDU, WRDY, WTBK, WTCW, WUAA, WUAB.

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, 1931, and the International List of Broadcasting Stations, published by the Berne bureau]

KECA (Los Angeles, Calif.).—Licensee, Earle C. Anthony (Inc.).
 KFJR (Portland, Oreg.).—Licensee, Ashley C. Dixon-KFJR (Inc.).
 KGIH (Little Rock, Ark.).—Licensee, O. A. Cook.
 KLPN (Minot, N. Dak.).—Fy., 1,240 (241.9); power, 250.
 KREG (Santa Ana, Calif.).—Licensee, J. S. Edwards.
 KTSA (San Antonio, Tex.).—Power, 1,000 night, 2,500 day.
 KTSL (Shreveport, La.).—Loc., changed to Laurel, Miss.; call changed to WTSL;
 KWCR (Cedar Rapids, Iowa).—Licensee, Cedar Rapids Broadcast Co.
 WAGM (Mars Hill, Me.).—Loc., changed to Presque Isle, Me.

WBAK (Harrisburg, Pa.).—Loc. (approximate), 76° 52' 30'' W., 40° 16' 30'' N.
WBAX (Wilkes-Barre, Pa.).—Post-office address, 70 South Main St.
WBEN (Martinsville, N. Y.).—Licensee, WBEN (Inc.).
WELK (Philadelphia, Pa.).—Post-office address, Elks Club.
WFDV (Rome, Ga.).—Licensee, Rome Broadcasting Corporation.
WGBS (Astoria, N. Y.).—Licensee, American Radio News Corporation.
WGST (Atlanta, Ga.).—Post-office address, Third and Cherry Sts.
WJAK (Marion, Ind.).—Licensee, The Truth Publishing Co. (Inc.).
WKBC (Birmingham, Ala.).—Loc., 86° 48' 57'' W., 33° 32' 12'' N.
WKJC (Lancaster, Pa.).—Licensee, Lancaster Broadcasting Service (Inc.).
WKZO (Berrien Springs, Mich.).—Transmitter loc., changed to Kalamazoo, Mich. (near), 85° 37' 53'' W., 42° 18' 19'' N.; post-office address and studio changed to New Burdick Hotel, Kalamazoo, Mich.
WMAQ (Addison, Ill.).—Licensee, National Broadcasting Co. (Inc.).
WMAZ (Macon, Ga.).—Licensee, Southeastern Broadcasting Co. (Inc.).
WOCL (Jamestown, N. Y.).—Power, 50.
WPRO (Cranston, R. I.).—Post-office address, 20 Richmond St., Providence, R. I.
WBRJ (Hattiesburg, Miss.).—Licensee, Hattiesburg Broadcasting Co. (W. E., F. E., and P. L. Barclift).
WSMB (New Orleans, La.).—Licensee, WSMB (Inc.).
WTAD (Quincy, Ill.).—Licensee, Illinois Broadcasting Corporation.
WTFI (Toccoa, Ga.).—Transmitter, studio and post-office address changed to 133 Washington St., Athens, Ga., loc., 83° 22' 24'' W., 33° 54' 38'' N.
 Strike out all particulars of the following-named station: **KFQW** (Seattle, Wash.).

EXPERIMENTAL STATIONS, ALPHABETICALLY, BY NAMES OF STATIONS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1931]

California: Palo Alto **W6XD**.—Fy., strike out 27,800 (10.791), 30,200 (9.93), add 27,100 (11.07), 34,600 (8.67).
Missouri: Carterville **W9XX**.—Loc., changed to Shreveport, La.; fy., add 2,398 (125.1), 3,256 (92.5), 4,795 (62.57), 6,425 (46.7), 8,650 (34.68), 12,850 (23.35), 17,300 (17.341), 23,100 (12.99), 25,700 (11.67), 26,000 (11.54), 27,100 (11.07), 34,600 (8.67), 41,000 (7.32), 51,400 (5.83), 60,000 (5) to 400,000 (.75), 401,000 (.74) and above.
New Jersey:
 Camden **W3XAJ**.—Fy., strike out 23,100 (12.987), 25,700 (11.673), 26,000 (11.538), 27,100 (11.07), 34,600 (8.67), 41,000 (7.31), 51,400 (5.83), 60,000 (5) to 400,000 (.75) and above 401,000 (.74).
 Lawrenceville **W3XT**.—Fy., add 10,675 (28.11).

Portable

Ohio: Suffield (Wingfoot Lake) **W8XA**.—Now stationary.

RELAY BROADCASTING STATIONS, ALPHABETICALLY, BY NAMES OF STATIONS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1931]

Vessels

Nautilus K7XI.—Strike out all particulars.

VISUAL BROADCASTING STATIONS BY NAMES OF STATIONS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1931]

Illinois: Chicago **W9XAA**.—Fy., strike out 2,000 (150) to 2,100 (142.9).

MISCELLANEOUS

CHANGES IN THE LIST OF VESSELS EQUIPPED WITH A RADIO COMPASS

The following named vessels are additions to the lists published in Commercial and Government Radio Stations of the United States, edition June 30, 1931, and the International List of Ships Stations published by the Berne bureau. These changes have been made in the 1931 edition of the list first named.

Name	Call signal	Owner
COMMERCIAL		
Cities Service Petrol.....	KDMB	Cities Service Transportation Co.
City of Atlanta.....	WFCJ	Ocean S. S. Co. of Savannah.
City of Havre.....	WXIA	Baltimore Mail S. S. Co. (Inc.).
City of Lowell.....	WRCB	New England S. S. Co.
Topila.....	WICV	Southern Pacific Co. (Inc.).
Torres.....	WICW	Do.
Sulphite.....	KENQ	Detroit Sulphite Transportation Co.
W. J. Hanna.....	KDKX	Standard Shipping Co.

The radio compass has been removed from the following-named vessel: Commercial-Timberman.

PROCEDURE FOR CALLING COAST GUARD VESSELS IN CASE OF DISTRESS

The United States Coast Guard is maintained by the Government for the purpose of rendering assistance to vessels in distress and saving life and property at sea and along our coasts.

The Coast Guard makes no charge for its services to vessels in distress and will respond promptly to requests for assistance so far as the distribution and condition of its facilities will permit. However, it is not the purpose of the Coast Guard to compete with commercial enterprise in ordinary towing and salvage operations, but to confine its assistance activities, generally speaking, to cases of actual or potential distress.

Radio equipped vessels requiring assistance may obtain the services of the Coast Guard by transmitting a request on the international distress and calling frequency, 500 kilocycles (410 kilocycles on the Great Lakes), to "Any Coast Guard Unit" (Radio call NCU), or to any shore radio station addressed to "Coast Guard." Shore radio stations will forward to the Coast Guard all information regarding vessels requiring assistance unless such information is contained in a message specifically addressed elsewhere.

If the following information is included in the original request for assistance, it will place the responsible Coast Guard officer in a position to determine immediately the types and number of vessels required to render adequate aid, thus greatly facilitating the work of the Coast Guard and avoiding any unnecessary delay in the dispatching of assistance.

1. Name, type, and nationality of vessel.
2. Position, course, and speed (including drift).
3. Nature of trouble and condition of vessel, sea, and wind.
4. Number of persons on board.
5. State whether or not Coast Guard assistance is requested.

In cases of extreme emergency, when an "SOS" is broadcast, it is requested that the following procedure be followed by the vessel in distress. Approximately 10 minutes after transmission of the original distress message, transmit slowly, on the distress frequency, "MO" and own radio call for 3 minutes. This will enable Coast Guard vessels and stations in the vicinity to obtain direction finder bearings and accurately plot the position of the distressed vessel.

Coast Guard administrative offices are located as follows:

- Boston, Mass.—Customhouse; telephone Hancock 3540.
- New London, Conn.—State Pier; telephone New London 5366.
- New York, N. Y.—Customhouse; telephone Whitehall 4-2717.
- Washington, D. C.—Treasury Annex No. 1; telephone National 6400-667.
- Norfolk, Va.—Customhouse; telephone Norfolk 2-6638.
- Fort Lauderdale, Fla.—Sweet Building; telephone Fort Lauderdale 31.
- Mobile, Ala.—Customhouse; telephone Dexter 5812 or 314.
- Sault Ste. Marie, Mich.—Post Office Building; telephone Saint Marie 132 or 602.
- Seattle, Wash.—Joseph Vance Building; telephone Main 4464.
- San Francisco, Calif.—Customhouse; telephone Exbrook 7494.

The telegraphic and radio addresses are "Coast Guard Boston," "Coast Guard New York," etc.

RADIO OPERATOR COMMENDED FOR MERITORIOUS WORK IN EMERGENCY

The President of the United States Shipping Board recently addressed a letter to E. J. Marshall, radio operator of the S. S. *Independence Hall* for exceptional service in establishing and maintaining communication between the dis-

abled submarine *Nautilus* and the battleships *Arkansas* and *Wyoming* at the time the radio transmitters of the *Nautilus* were out of commission and only faint radiating-receiver signals were being omitted. Due to the excellent work of operator Marshall it was possible for the battleships to locate the *Nautilus* by means of radio direction-finder bearings.

A record of this efficient operating has been placed in the operator's case in both the files of the Shipping Board and the Radio Division of the Department of commerce.

BROADCASTING STATION FREQUENCY MEASUREMENTS DURING SEPTEMBER

During this month 328 stations were measured by the Radio Division of the Department of Commerce of which 115 deviated less than 50 cycles, 72 less than 100, and 68 less than 200. The remaining 73 measured deviated more than 200 cycles. These figures do not indicate improvement over the measurements made during August, but they do represent more efficient maintenance of operation on assigned frequencies over other previous months. The number deviating less than 50 cycles decreased by 2 stations, although 24 stations more were measured during September showing a loss of 3½ per cent in the number of stations in this class compared with August. The number deviating over 100 and 200 cycles showed a slight increase, while a larger increase (17 stations—3½ per cent) is shown in the class deviating more than 200 cycles, compared with August.

The following table gives the figures for the months December, 1930, to September, 1931, inclusive:

Month	Number measured	Under 50	Under 100	Under 200	Over 200
December	339	-----	35 (13.5 per cent) ..	66 (16.5 per cent) ..	238 (70 per cent).
January	363	-----	54 (15 per cent) ..	102 (27 per cent) ..	207 (58 per cent).
February	367	-----	99 (27 per cent) ..	55 (15 per cent) ..	213 (58 per cent).
March	337	65 (19.3 per cent) ..	63 (18.8 per cent) ..	77 (22.8 per cent) ..	132 (39.1 per cent).
April	314	72 (22.9 per cent) ..	84 (17.2 per cent) ..	92 (29.3 per cent) ..	96 (30.6 per cent).
May	326	78 (23.9 per cent) ..	89 (27.5 per cent) ..	68 (20.9 per cent) ..	91 (27.9 per cent).
June	330	97 (29.4 per cent) ..	71 (21.5 per cent) ..	69 (20.9 per cent) ..	93 (28.2 per cent).
July	294	94 (32 per cent) ..	70 (23.8 per cent) ..	60 (20.4 per cent) ..	70 (23.8 per cent).
August	304	117 (38.5 per cent) ..	64 (21 per cent) ..	67 (22 per cent) ..	56 (18.5 per cent).
September	328	115 (35 per cent) ..	72 (22 per cent) ..	68 (21 per cent) ..	73 (22 per cent).

UNDER 50 CYCLES

Call signal	Transmitter location, studio location in parentheses	Call signal	Transmitter location, studio location in parentheses
KFAB	Lincoln, Nebr.	KRLD	Dallas, Tex.
KFAO	Los Angeles, Calif.	KSAC	Manhattan, Kans.
KFDM	Beaumont, Tex.	KSD	St. Louis, Mo.
KFEL	Denver, Colo.	KTAR	Phoenix, Ariz.
KFEQ	St. Joseph, Mo.	KTHS	Hot Springs, Ark.
KFJF	Oklahoma City, Okla.	KTSM	El Paso, Tex.
KFJI	Astoria, Oreg.	KVOO	Tulsa, Okla.
KFJR	Portland, Oreg.	KVOS	Bellingham, Wash.
KFLV	Rockford, Ill.	KWKH	Kennewood, La. (Shreveport).
KFRU	Columbia, Mo.	KYA	San Francisco, Calif.
KFSD	San Diego, Calif.	WABO	} Rochester, N. Y.
KFVD	Culver City, Calif.	WHFC	
KFWB	Hollywood, Calif.	WADO	Tallmadge, Ohio (Akron).
KFXF	Denver, Colo.	WAPI	Birmingham, Ala.
KFYR	Bismarck, N. Dak.	WBAK	Harrisburg, Pa.
KGA	Spokane, Wash.	WBBM	Glenview, Ill. (Chicago).
KGB	San Diego, Calif.	WBBR	Rossville, N. Y. (Brooklyn).
KGJF	Los Angeles, Calif.	WBT	Charlotte, N. C.
KGO	Oakland, Calif. (San Francisco).	WBZ	} Millis Township, Mass. (Boston).
KHQ	Spokane, Wash.	WBZA	
KJR	Seattle, Wash.	WCAO	Baltimore, Md.
KLX	Oakland, Calif.	WCBM	Do.
KLZ	Denver, Colo.	WCFL	Chicago, Ill.
KMED	Medford, Oreg.	WCHI	Deerfield, Ill. (Chicago).
KMJ	Fresno, Calif.	WCKY	Crescent Springs, Ky. (Covington).
KMO	Tacoma, Wash.	WCSH	Scarboro, Me. (Portland).
KMOX	St. Louis, Mo.	WDAF	Kansas City, Mo.
KMPC	Beverly Hills, Calif.	WDBO	Orlando, Fla.
KMTR	Los Angeles, Calif.	WDSU	Gretna, La. (New Orleans).
KOIL	Council Bluffs, Iowa.	WEAF	Bellmore, N. Y. (New York City).
KFO	San Francisco, Calif.	WEAN	Providence, R. I.

UNDER 60 CYCLES—Continued

Call signal	Transmitter location, studio location in parentheses	Call signal	Transmitter location, studio location in parentheses
WEDC	Chicago, Ill.	WMMN	Fairmont, W. Va.
WEEI	Weymouth, Mass. (Boston).	WMSG	New York, N. Y.
WENR	Downers Grove, Ill. (Chicago).	WNAX	Yankton, S. Dak.
WFAA	Grapevine, Tex. (Dallas).	WNBH	Fair Haven, Mass. (New Bedford).
WFAAN	Philadelphia, Pa.	WQAI	Selma, Tex. (San Antonio).
WIP		Do.	WOO
WFI	Do.	WOI	Ames, Iowa.
WFOX	Brooklyn, N. Y.	WOKO	Albany, N. Y.
WGCM	Mississippi City, Miss. (Gulfport).	WOS	Jefferson City, Mo.
WGES	Chicago, Ill.	WOW	Omaha, Nebr.
WGN	Elgin, Ill. (Chicago).	WOWO	Fort Wayne, Ind.
WGY	Schenectady, N. Y.	WPOR	Norfolk, Va.
WHAP	New York, N. Y.	WTAR	
WHN	Do.	WPTF	Raleigh, N. C.
WHO	Des Moines, Iowa.	WQBC	Vicksburg, Miss.
WHP	Lemoyno, Pa. (Harrisburg).	WRAX	Philadelphia, Pa.
WIBO	Des Plaines, Ill. (Chicago).	WRC	Washington, D. C.
WIBW	Topeka, Kans.	WRVA	Mechanicsville, Va. (Richmond).
WJSV	Mt. Vernon Hills, Va. (Alexandria).	WBB	Atlanta, Ga.
WJZ	Bound Brook, N. J. (New York City).	WSBO	Chicago, Ill.
WKJC	Lancaster, Pa.	WSEN	Columbus, Ohio.
WKRC	Cincinnati, Ohio.	WSMB	New Orleans, La.
WLBZ	Bangor, Me.	WSUI	Iowa City, Iowa.
WLIT	Philadelphia, Pa.	WTAG	Worcester, Mass.
WLS	Downers Grove, Ill. (Chicago)	WTAM	Brecksville Village, Ohio (Cleveland).
WLW	Mason, Ohio (Cincinnati).	WTMJ	Brookfield, Wis. (Milwaukee).
WMAL	Washington, D. C.	WWJ	Detroit, Mich.
WMAQ	Addison, Ill. (Chicago).	WXYZ	Do.
WMBC	Detroit, Mich.		

UNDER 100 CYCLES

KDKA	Saxonsburg, Pa. (Pittsburgh)	WGAR	Cuyahoga Heights, Ohio (Cleveland).
KDYL	Salt Lake City, Utah.	WGR	Amherst, N. Y. (Buffalo).
KELW	Burbank, Calif.	WHAM	Rochester, N. Y.
KFBB	Great Falls, Mont.	WHB	Kansas City, Mo.
KFQU	Alma—Holy City, Calif.	WHDH	Gloucester, Mass. (Boston).
KFRO	San Francisco, Calif.	WHFO	Cicero, Ill.
KFSG	Los Angeles, Calif.	WIBA	Madison, Wis.
KGBZ	York, Nebr.	WILM	Carrcroft-Edgemoor, Del. (Wilmington).
KGGF	Coffeyville, Okla.		Jacksonville, Fla.
KMBC	Independence, Mo. (Kansas City).	WJAX	Cleveland, Ohio.
KMOS	Inglewood, Calif.	WJAY	New Orleans, La.
KNX	Los Angeles, Calif. (Hollywood)	WJBO	Moosheart, Ill.
KOA	Denver, Colo.	WJJD	Sylvan Lake Village, Mich. (Detroit).
KOY	Phoenix, Ariz.	WJR	Oglethorpe University, Ga.
KREG	Santa Ana, Calif.	WJTL	Youngstown, Ohio.
KSL	Salt Lake City, Utah.	WKBN	Jersey City, N. J.
KTAB	Oakland Calif., (San Francisco).	WKBO	Amherst, N. Y. (Buffalo).
KTBR	Portland, Oreg.	WKBW	Oklahoma City, Okla.
KTBS	Shreveport, La.	WKY	Nashville, Tenn.
KTM	Santa Monica, Calif. (Los Angeles).	WLAC	Lexington, Mass.
KVI	Des Moines, Wash. (Tacoma).	WLEY	Chelsea, Mass. (Boston).
KWJJ	Portland, Oreg.	WLOE	Addison, Ill. (Chicago).
KXA	Seattle, Wash.	WMBI	Hoboken, N. J. (New York City).
WAAB	Lexington, Mass.	WMCA	Waterloo, Iowa.
WAAP	Chicago, Ill.	WMT	New York, N. Y.
WAAM	Newark, N. J.	WNYC	Paterson, N. J.
WABO	Wayne, N. J. (New York City).	WODA	Washington, D. C.
WBAL	Glen Morris, Md. (Baltimore).	WOL	Philadelphia, Pa.
WBAP	Grapevine, Tex. (Fort Worth).	WPEN	Atlantic City, N. J.
WCAH	Columbus, Ohio.	WPG	Whitehaven, Tenn. (Memphis).
WCDA	Cliffside Park, N. J. (New York City)	WREC	Gainesville, Fla.
WCRW	Chicago, Ill.	WRUF	Mason, Ohio (Cincinnati).
WDEL	Wilmington, Del.	WSAI	South Bend, Ind.
WDRC	Bloomfield, Conn. (Hartford).	WSBT	Nashville, Tenn.
WFBL	Collamer, N. Y. (Syracuse).	WSM	Wheeling, W. Va.
WFBM	Indianapolis, Ind.	WWVA	
WFBR	Baltimore, Md.		

UNDER 200 CYCLES

Call signal	Transmitter location, studio location in parentheses	Call signal	Transmitter location, studio location in parentheses
KBPS	Portland, Oreg.	WBCM	Hampton Township, Mich. (Bay City).
KEX	Do.	WBEN	Martinsville, N. Y. (Buffalo).
KFBK	Sacramento, Calif.	WBSS	Needham, Mass.
KFH	Wichita, Kans.	WCAM	Camden, N. J.
KFKX	Bloomington Township, Ill. (Chicago).	WCAU	Byberry, Pa. (Philadelphia).
KYW	Shenandoah, Iowa.	WCBA	Allentown, Pa.
KFNF	Lincoln, Nebr.	WCOO	Harrisburg, Pa.
KFOR	Long Beach, Calif.	WDAY	Fargo, N. Dak.
KFOX	Spokane, Wash.	WDBJ	Roanoke, Va.
KFPY	San Bernardino, Calif.	WEVD	Forest Hills, N. Y. (New York City).
KFXM	Stockton, Calif.	WEXL	Royal Oak, Mich.
KGDM	San Francisco, Calif.	WGBI	Scranton, Pa.
KGGG	Grant City, Mo.	WHBL	Sheboygan, Wis.
KGIZ	Amarillo, Tex.	WIBU	Poynette, Wis.
KGRS	Los Angeles, Calif.	WIL	St. Louis, Mo.
KHJ	Red Oak, Iowa.	WJAG	Norfolk, Nebr.
KICK	Ogden, Utah.	WJAZ	Mount Prospect, Ill. (Chicago).
KLO	Oakland, Calif.	WKBB	Joliet, Ill.
KLS	Shenandoah, Iowa.	WKBF	Clermont, Ind. (Indianapolis).
KMA	Clay Center, Nebr.	WLBW	Oil City, Pa.
KMMJ	Portland, Oreg.	WMBD	Peoria Heights, Ill.
KOIN	Seattle, Wash.	WMC	Bartlett, Tenn. (Memphis).
KPCB	Houston, Tex.	WNAO	Quincy, Mass. (Boston).
KPRC	Shreveport, La.	WOOD	Furnwood, Mich. (Grand Rapids).
KRMD	Richmond, Calif. (Oakland).	WOR	Kearny, N. J. (Newark).
KROW	Seattle, Wash.	WPAP	Cliffside, N. J. (New York City).
KRSC	Clarinda, Iowa.	WQAO	Do.
KSO	Houston, Tex.	WRHM	Fridley, Minn. (Minneapolis).
KTRH	Fayetteville, Ark.	WRNY	Coytesville, N. J. (New York City).
KUOA	Kirkwood, Mo. (St. Louis).	WSAN	Allentown, Pa.
KWK	Portland, Oreg.	WSPD	Toledo, Ohio.
KXL	El Centro, Calif.	WTIO	Mt. Avon, Conn. (Hartford).
KXO	New Orleans, La.	WWL	New Orleans, La.
WABZ	Columbus, Ohio.	WWRL	Woodside, N. Y.
WAIU	Zarepath, N. J.		
WAWZ			

USE OF RADIO BY FOREIGN VESSELS IN RUSSIAN PORTS—PENALTY

The following regulations have been issued by the Soviet Government respecting the use of radio installations by foreign vessels when in U. S. S. R. waters:

1. The working of wireless stations on board foreign vessels (except war vessels) in the territorial waters and inland waters of the U. S. S. R. for a distance of 10 miles from the shore is subject to the control of the head of the corresponding commercial port.

The regulations for interior wireless communication, which have not been generally notified will be communicated to foreign vessels, on their arrival in U. S. S. R. ports, by the proper local naval or port authorities.

2. When foreign vessels call at a port of the U. S. S. R., or anchor within the limits stated in Clause I, after the quarantine flag has been hauled down (up to the time when the customs and passport formalities have been carried out), all receiving and transmitting stations on board foreign vessels, as well as the compartments in which they are installed, are to be closed and sealed with the seal of the port department concerned by an official authorized by the head of the port.

3. The opening and unsealing of the wireless installations will be carried out by order of the head of the commercial port after the customs formalities are finished and the passengers embarked in the vessel leaving for abroad.

4. In the case of foreign vessels lying in ports where there are no shore wireless stations (see note), and also on the application of interested parties, in ports where the water is shallow and the vessels have to lie in the roadstead, the sealing and closing of the installation may be dispensed with. The vessel will then be only allowed to carry on conversation en clair for a definite time, and will be debared from using any sort of cipher or code, except the regular conventional signals.

NOTE.—Foreign merchant vessels in ports where the nearest coastal wireless installation is outside a radius of 10 miles and also within the Sea of Azov, may be allowed to use their wireless installations only under special written permits from the chief of the corresponding commercial port, to be issued for a period or for each separate occasion that the vessel visits the ports or inland waters of the Union of Soviet Socialist Republics.

In case the nearest coastal wireless station belonging to the People's Commissariat for Military and Naval Affairs or other department is situated at a distance of not more than 10 miles in radius from the corresponding commercial port, the aforesaid foreign vessels receive permission for wireless communication

from the chief of the commercial port only in agreement with the local representatives of the respective departments.

5. The master and crew of foreign vessels are forbidden to have on board in an unsealed form any transmitting or receiving installations, capable of establishing wireless telegraphic or telephonic communications from their vessels at the time when the main installations are out of action.

6. Should the customs authorities find any transmitting or receiving apparatus, which has been concealed from inspection by the master or crew of a vessel, masters of foreign vessels, in addition to the penalties to which they are liable according to the customs regulations, will be answerable under Part I, article 88, of the Penal Code and the corresponding penal codes of the U. S. S. R.

Should similar apparatus be found concealed from the customs inspection by passengers, the responsibility will be on those persons in whose possession they were found.

The infringement of these regulations by either vessels under the Soviet flag or under a foreign flag is punishable by deprivation of liberty for a period up to two years or a fine of 10,000-rubles.

QUARTZ PLATE MOUNTINGS AND TEMPERATURE CONTROL FOR PIEZO OSCILLATORS

In a paper of the above title, by V. E. Heaton and E. G. Lapham, Research Paper No. 366, Bureau of Standards Journal of Research, October, 1931, there are described a number of representative types of mountings for rectangular and circular quartz plates to be used as frequency standards. A satisfactory holder for mounting a long rectangular quartz plate to oscillate in its extensional mode and a holder for mounting a cylindrical quartz plate for "thickness oscillation" are described. A value is given for the probable constancy of frequency for each type of plate holder. Some discussion is given the subject of temperature control of the piezo oscillator.

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

AN IMPROVED AUDIO-FREQUENCY GENERATOR

In a paper of the above title, by E. G. Lapham, Research Paper No. 367, Bureau of Standards Journal of Research, October, 1931, there is described in detail the construction of an audio-frequency generator for use in making radio-frequency measurements. The variable audio-frequency output is the beat note between the sources of radio frequency; the one a piezo oscillator and the other a variable oscillator. The output is continuously variable from 50 to 1,500 cycles per second. The entire unit is assembled very compactly and the essential parts are mounted in a temperature-controlled compartment. The calibration curve is practically linear over a range of 50 cycles per second, and repeated calibrations indicate that it is constant to better than 0.1 cycle per second over the entire range.

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

SOME EXPERIMENTAL STUDIES OF THE VIBRATIONS OF QUARTZ PLATES

In a paper of the above title, by R. B. Wright and D. M. Stuart, Research Paper No. 356, Bureau of Standards Journal of Research, September, 1931, a large number of modes of vibrations of 0° and 30° cut circular and rectangular crystalline quartz plates are studied. These plates are piezoelectric and are used extensively in radio technique as frequency standards. The behavior of lycopodium powder when applied during vibration proved to be the best method for obtaining information. Many photographs of figures or patterns obtained in this manner are shown. Certain methods of rigidly mounting quartz plates and rods which may be advantageously incorporated in the design of radio-frequency standards are indicated.

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

BROADCAST SCHEDULES OF NAVAL STATIONS TRANSMITTING TIME, WEATHER, HYDROGRAPHIC, ICE, AND PRESS BULLETINS

Time (Greenwich civil)	Station	Call signal	Frequency in kilocycles, wave length (meters) in parentheses; type of emission	Material broadcast
0000	Brownsville, Tex.-----	NAY	104 (2,885) A1	Weather.
	San Francisco, Calif.-----	NPG	108 (2,776) A1	Weather (Bonita Channel)
0018	Eureka, Calif.-----	NPW	108 (2,776) A1	Weather, hydrographic.
0100	Puget Sound, Wash.-----	NPC	102 (2,939) A1	Weather.
0105	Washington, D. C. (Arlington, Va.)-----	NAA	8,150 (36.3) A1	Aviation weather and upper-air reports.
0115	Guantanamo Bay, Cuba-----	NAW	113 (2,653) A1	Weather (July 1 to Nov. 15).
0130	Norfolk, Va.-----	NAM	122 (2,460) A1	Weather.
	Astoria, Oreg.-----	NPE	102 (2,939) A1	Do.
0200	San Juan, P. R.-----	NAU	113 (2,653) A1	Caribbean weather (July 1 to Nov. 15).
	Washington, D. C. (Arlington, Va.)-----	NAA	113 (2,653) A1	Hydrographic, ice reports in season.
	San Francisco, Calif.-----	NPG	(42.8 (7,005) A1 108 (2,776) A1 4,385 (68.41) A2	Aviation weather.
0230	Honolulu, Hawaii-----	NPM	54 (5,552) A2	Weather, hydrographic.
	San Francisco, Calif.-----	NPG	(42.8 (7,005) A1; 66 (4,543) A1; 108 (2,776) A1; 12,885 (23.28) A1 113 (2,653) A2 690 (435) A3	Rebroadcast of Arlington (Va.) time signals. ¹
0255-0300	Washington, D. C. (Arlington, Va.)-----	NAA	4205 (74.72) A1 8410 (35.65) A1 12,615 (23.78) A1	Time signals. ¹
	Washington, D. C. (Annapolis, Md.)-----	NSS	17.8 (16,840) A1	
	Cavite, P. I.-----	NPO	(56 (5,354) A1 8,872 (33.81) A2 17,744 (16.9) A2 64 (4,690) A1	Time signals. ^{1, 2}
0300	Washington, D. C. (Arlington, Va.)-----	NAA	113 (2,653) A1 4,205 (71.4) A2 8,410 (35.7) A3	Marine weather.
	Puget Sound, Wash.-----	NPC	102 (2,939) A1	Weather, hydrographic.
	Washington, D. C. (Navy Yard).-----	NAA	690 (435) A3	Weather.
0330	San Francisco, Calif.-----	NPG	(42.8 (7,005) A1 108 (2,776) A1 4,385 (68.41) A2	Marine weather, hydrographic.
0355-0400	Balboa, Canal Zone-----	NBA	46 (6,518) A1	Time signals. ⁴
	Colon, Canal Zone-----	NAX	132 (2,271) A1	
	Arlington, Va.-----	NAA	4,015 (74.72) A1	Weather broadcast to Europe
	Great Lakes, Ill.-----	NAJ	122 (2,460) A1	Weather, hydrographic.
0400	Puget Sound, Wash.-----	NPC	102 (2,939) A1	Weather.
	San Juan, P. R.-----	NAU	113 (2,653) A1	Do.
	Key West, Fla.-----	NAR	do	Weather, hydrographic.
	Astoria, Oreg.-----	NPE	102 (2,939) A1	Do.
	San Francisco, Calif.-----	NPG	108 (2,776) A1	Weather (Bonita Channel).
0430	San Diego, Calif.-----	NPL	102 (2,939) A1	Weather.
	Cavite, P. I.-----	NPO	(56 (5,354) A1 8,872 (33.81) A2 17,744 (16.9) A2	Do.
0433	Eureka, Calif.-----	NPW	108 (2,776) A1	Weather, hydrographic.
0455-0500	Washington, D. C. (Arlington, Va.)-----	NAA	4,015 (74.72) A1	Time signals.
	Washington, D. C. (Annapolis, Md.)-----	NSS	17.8 (16,840) A1	
0500	Brownsville, Tex.-----	NAY	104 (2,883) A1	Weather.
0530	Dutch Harbor, Alaska-----	NPR	185 (1,621) A2	Local weather.
0630	Honolulu, Hawaii-----	NPM	54 (5,552) A2	Weather, hydrographic.
	Washington, D. C. (Annapolis, Md.)-----	NSS	(17.8 (16,840) A1 8,030 (37.34) A1	Press for naval vessels only.
0700	Washington, D. C. (Arlington, Va.)-----	NAA	113 (2,653) A1	
	San Francisco, Calif.-----	NPG	(42.8 (7,005) A1 66 (4,543) A1 108 (2,776) A1 8,590 (34.92) A1 17.8 (16,840) A1	Rebroadcast of Arlington (Va.) time signals. ¹
0755-0800	Washington, D. C. (Annapolis, Md.)-----	NSS	17.8 (16,840) A1	Time signals.
	Washington, D. C. (Arlington, Va.)-----	NAA	(113 (2,653) A2 4,015 (74.72) A1 8,410 (35.65) A3	
0800	San Francisco, Calif.-----	NPG	108 (2,776) A1	Weather (Bonita Channel).
0818	Eureka, Calif.-----	NPW	108 (2,776) A1	Weather, hydrographic.

BROADCAST SCHEDULES OF NAVAL STATIONS TRANSMITTING TIME, WEATHER, HYDROGRAPHIC, ICE, AND PRESS BULLETINS—continued

Time (Greenwich civil)	Station	Call signal	Frequency in kilocycles, wave length (meters) in parentheses; type of emission	Material broadcast
0900	Norfolk, Va.....	NAM	122 (2,460) A1.....	Weather, hydrographic ice reports in season.
1000	Balboa, Canal Zone.....	NBA	46 (6,518) A1.....	Hydrographic press for naval vessels only.
	Colon, Canal Zone.....	NAX	102 (2,939) A1.....	Press for naval vessels only.
1200	San Diego, Calif.....	NPL	132 (2,271) A1.....	Hydrographic.
1218	San Francisco, Calif.....	NPG	80.6 (9,798) A1.....	Press for naval vessels only.
	Eureka, Calif.....	NPW	108 (2,776) A1.....	Weather (Bonita Channel). Weather, hydrographic.
1230	Cavite, P. I.....	NPO	56 (5,354) A1..... 8,872 (33.81) A2..... 17,744 (16.9) A2.....	Do.
1300	Puget Sound, Wash.....	NPC	102 (2,939) A1.....	Weather.
1305	Washington, D. C. (Arlington, Va.).....	NAA	4,015 (74.72) A1..... 12,225 (24.5) A1.....	Aviation weather and upper-air reports.
	Washington, D. C. (Annapolis, Md.).....	NSS	8,030 (37.34) A1.....	
1330	Norfolk, Va.....	NAM	122 (2,460) A1.....	Weather.
1355-1400	Astoria, Oreg.....	NPE	102 (2,939) A1.....	Time signals, ¹ weather, hydrographic.
	Cavite, P. I.....	NPO	56 (5,354) A1..... 8,872 (33.81) A2..... 42.8 (7,005) A1.....	
1400	San Francisco, Calif.....	NPG	108 (2,776) A1..... 4,385 (68.41) A2..... 64 (4,690) A1.....	Aviation weather.
1500	Arlington, Va.....	NAA	113 (2,653) A1..... 16,820 (17.7).....	Marine weather.
1510	Washington, D. C. (Navy Yard). New York, N. Y.....	NAA NAH	690 (435) A3..... 102 (2,939) A1.....	Weather.
1530	Charleston, S. C.....	NAO	122 (2,460) A1.....	Weather, hydrographic, ice reports in season. Weather, hydrographic.
	San Francisco, Calif.....	NPG	42.8 (7,005) A1..... 108 (2,776) A1..... 4,385 (68.41) A2.....	
1548	Philadelphia, Pa.....	NAI	104 (2,885) A1.....	Weather, hydrographic.
	Pensacola, Fla.....	NAS	113 (2,653) A1.....	Weather.
	Boston, Mass.....	NAD	102 (2,939) A1.....	Weather, hydrographic, ice reports in season.
1600	Norfolk, Va.....	NAM	122 (2,460) A1.....	Do.
	Washington, D. C. (Arlington, Va.).....	NAA	16,820 (17.7) A1.....	Weather broadcast to Europe.
	New Orleans, La.....	NAT	104 (2,885) A1.....	Weather.
	San Juan, P. R.....	NAU	113 (2,653) A1.....	Do.
1618	Savannah, Ga.....	NEV	185 (1,621) A2.....	Do.
	Great Lakes, Ill.....	NAJ	122 (2,460) A1.....	Weather, hydrographic.
1630	Jupiter, Fla.....	NAQ	185 (1,621) A2.....	Weather.
	San Diego, Calif.....	NPL	102 (2,939) A1.....	Do.
1633	San Francisco, Calif.....	NPG	108 (2,776) A1.....	Weather (Bonita Channel).
	Eureka, Calif.....	NPW	108 (2,776) A1.....	Weather, hydrographic.
	San Francisco, Calif.....	NPG	42.8 (7,005) A1, 66 (4,543) A1, 108 (2,776) A1, 12,885 (23.28) A1..... 113 (2,653) A2.....	Rebroadcast of Arlington, Va., time signals. ¹
			690 (435) A3.....	
1655-1700	Washington, D. C. (Arlington, Va.).....	NAA	4,205 (74.72) A1..... 8,410 (35.65) A1..... 12,615 (23.78) A1..... 16,820 (17.8) A1.....	Time signals. ¹
	Washington, D. C. (Annapolis, Md.).....	NSS	17.8 (16,840) A1.....	
1657-1700	Key West, Fla.....	NAR	106 (2,828) A1.....	Time signals. ⁴
	San Diego, Calif.....	NPL	80.6 (9,798) A1..... 102 (2,939) A1.....	
1700	New Orleans, La.....	NAT	104 (2,885) A1.....	Hydrographic, ice reports in season. Weather. Weather, hydrographic. Weather.
	Great Lakes, Chicago, Ill.....	NAJ	122 (2,460) A2.....	
	Astoria, Oreg.....	NPE	102 (2,939) A1.....	
	Washington, D. C. (Arlington, Va.).....	NAA	113 (2,653) A1.....	
1700	Brownsville, Tex.....	NAY	104 (2,885) A1.....	Weather.
	Puget Sound, Wash.....	NPC	102 (2,939) A1.....	Weather, hydrographic.
	St. Augustine, Fla.....	NAP	185 (1,621) A1.....	Weather.
	New Orleans, La.....	NAT	104 (2,885) A1.....	Hydrographic.

BROADCAST SCHEDULES OF NAVAL STATIONS TRANSMITTING TIME, WEATHER, HYDROGRAPHIC, ICE, AND PRESS BULLETINS—continued

Time (Greenwich civil)	Station	Call signal	Frequency in kilocycles, wave length (meters) in parentheses; type of emission	Material broadcast
1730	Astoria, Oreg.....	NPE	102 (2,939) A1.....	Weather.
1755-1800	Balboa, Canal Zone.....	NBA	46 (6,518) A1.....	Time signals.†
1800	Colon, Canal Zone.....	NAX	132 (2,271) A1.....	
1800	Balboa, Canal Zone.....	NBA	46 (6,518) A1.....	Hydrographic.
1800	Key West, Fla.....	NAR	113 (2,653) A1.....	Weather, hydrographic.
1830	Honolulu, Hawaii.....	NPM	54 (5,552) A2.....	Do.
1900	Cavite, P. I.....	NPO	56 (5,354) A1.....	Press for naval vessels only.
2000	San Francisco, Calif.....	NPG	8,872 (33.81) A2.....	
2018	Eureka, Calif.....	NPW	108 (2,776) A1.....	Weather (Bonita Channel).
2030	Dutch Harbor, Alaska.....	NPR	108 (2,776) A1.....	Weather, hydrographic
2045	Washington, D. C. (navy yard).	NAA	185 (1,621) A2.....	Local weather.
2055-2100	Washington, D. C. (Arlington, Va.).	NAA	890 (435) A3.....	Weather (daily, except Sundays and holidays).
2100	Norfolk, Va.....	NAM	16,820 (17.8) A1.....	Time signals.
2100	Puget Sound, Wash.....	NPC	122 (2,460) A1.....	Weather, hydrographic ice reports in season.
2100	Guam.....	NPN	102 (2,939) A1.....	Weather, hydrographic.
2130	Astoria, Oreg.....	NPE	4,436 (67.82) A2.....	Press, for naval vessels only.
2130	New York, N. Y.....	NAH	13,308 (22.55) A2.....	
2200	Boston, Mass.....	NAD	102 (2,939) A1.....	Weather, hydrographic.
2200	Philadelphia, Pa.....	NAI	104 (2,885) A1.....	Weather, hydrographic.
2200	Great Lakes, Ill.....	NAJ	122 (2,460) A1.....	Hydrographic.
2230	San Diego, Calif.....	NPL	102 (2,939) A1.....	Weather.
2300	Honolulu, Hawaii.....	NPM	54 (5,552) A2.....	Weather, hydrographic.
2300	Charleston, S. C.....	NAO	122 (2,460) A1.....	Do.
2300	Jupiter, Fla.....	NAQ	185 (1,621) A2.....	Weather.
2303	Tutuila, Samoa.....	NPU	106 (2,828) A1.....	Weather, hydrographic.
2330	Pensacola, Fla.....	NAS	113 (2,653) A1.....	Weather.
2355-2400	Savannah, Ga.....	NEV	185 (1,621) A2.....	Do.
2400	Honolulu, Hawaii.....	NHP	38 (7,895) A1.....	Time signals.†
2400	Washington, D. C. (Annapolis, Md.).	NSS	106 (2,828) A2.....	
2400	Washington, D. C. (Annapolis, Md.).	NSS	8,030 (37.34) A3.....	

† First-order time signals.—These are precision time signals for chronometer rating and scientific use, normally correct as broadcast to less than one-tenth of a second.

NOTE.—Storm warnings will be broadcast upon receipt by radio stations concerned, and repeated each hour thereafter for a period of 12 hours or until the warning is superseded.

† Controlled by Manila Central Observatory.

† This frequency is discontinued at 0400 G. C. T.

† Third-order time signals.—These time signals are satisfactory for ordinary commercial and domestic timing, but not satisfactory for chronometer rating or precision timing, on account of a varying lag within comparatively wide limits.

† Second-order time signals.—These time signals for chronometer rating and ordinary use, normally correct as broadcast to less than five-tenths of a second, having a generally constant lag.

NOTE.—In the event of a failure or an error occurring in any of the time signals, another time signal will be transmitted 1 hour later on the same frequency.