

**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
Atlanta, Ga. (Candler Field). ¹	FA	WSDY	278 (1,080)	P	X	Aeronautical Radio (Inc.)
Boston, Mass. (municipal airport). ²	FA	WSDU	do	P	N	Do.
Cleveland, Ohio (municipal airport). ³	FA	WSDX	do	P	N	Do.
Columbus, Ohio (municipal airport). ⁴	FA	WSDV	do	P	N	Do.
Dallas, Tex. (Love Field). ⁵	FA	KGUX	do	P	X	Do.
Denver, Colo. ⁶	FX	KGPX	2,440 (123)	P	N	City and County of Denver, Colo. (police station).
Kansas City, Mo. (municipal airport). ⁷	FA	KGUW	278 (1,080)	P	N	Aeronautical Radio (Inc.)
Newark, N. J. (Newark airport). ⁸	FA	WSDW	do	P	N	Do.
Oakland, Calif. (Oakland airport). ⁹	FA	KGUY	do	P	X	Do.
Ponca City, Okla. (municipal airport). ¹⁰	FA	KGUZ	3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178 (94.39), 3,182.5 (94.26), 5,570 (53.86), 5,660 (53).	P	X	Do.
St. Louis, Mo. (Lambert Field). ¹¹	FA	KGUV	278 (1,080)	P	N	Do.
Salt Lake City, Utah (airport). ¹²	FA	KGTI	do	P	N	Do.
San Bruno, Calif. (municipal airport). ¹³	FA	KGYO	do	P	N	San Francisco Municipal Airport.
Wichita, Kans. ¹⁴	FA	KGTE	3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178 (94.39), 3,182.5 (94.26), 5,570 (53.86), 5,660 (53).	P	X	Aeronautical Radio (Inc.)

¹ Loc. (approximate), 84° 26' 00" W., 33° 40' 00" N.; type, A3.

² Loc., 71° 02' 06" W., 42° 22' 03" N.; type, A3.

³ Loc. (approximate), 81° 50' 45" W., 41° 24' 50" N.; type, A3.

⁴ Loc. (approximate), 82° 52' 40" W., 39° 59' 40" N.; type, A3.

⁵ Loc., 96° 51' 48" W., 32° 51' 49" N.; type, A3.

⁶ Loc., 104° 59' 59" W., 39° 44' 51" N.; type, A3.

⁷ Loc. (approximate), 94° 27' 00" W., 39° 06' 00" N.; type, A3.

⁸ Loc. (approximate), 75° 10' 00" W., 40° 43' 00" N.

⁹ Loc. (approximate), 122° 13' 00" W., 37° 43' 52" N.; type, A3.

¹⁰ Loc., 97° 05' 36" W., 36° 43' 12" N.; type, A1, A2, A3.

¹¹ Loc. (approximate), 90° 30' 00" W., 39° 00' 00" N.; type, A3.

¹² Loc. (approximate), 111° 58' 00" W., 40° 45' 00" N.; type, A3.

¹³ Loc., 122° 24' 30" W., 37° 37' 54" N.; type, A3.

¹⁴ Loc., 97° 15' 06" W., 37° 37' 54" 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 Traveler	KDJN	8	PG	X	United States Lines (Inc.)	R. M. C. A.
Chalena	WGEJ				Charles E. F. McCann	Do.
Mariposa	WGEN	8	PG	N	Oceanic S. S. Co.	Do.

¹ Type, A1, A2; fr., 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 468 (640), 500 (600), 5,515 (54.39), 5,520 (54.35), 5,525 (54.3), 5,530 (54.25), 6,170 (48.62), 6,180 (48.54), 6,190 (48.47), 6,200 (48.39), 6,210 (48.31), 6,220 (48.23), 6,230 (48.15), 8,240 (38.41), 8,250 (36.36), 8,280 (36.23), 8,290 (36.19), 8,330 (36.01), 11,025 (26.96), 11,040 (27.17), 11,055 (27.13), 11,070 (27.10), 11,085 (27.06), 12,360 (24.27), 12,375 (24.24), 12,420 (24.15), 12,435 (24.13), 16,480 (18.204), 16,500 (18.182), 16,560 (18.116), 16,580 (18.094), 16,660 (18.007).

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	Licensee
NC-326N	KHVJQ		P	X	National Park Airways (Inc.)
NC-330N	KHVKP		P	X	Do.
NC-412H	KHXDW		P	X	American Airways (Inc.)
NC-415H	KHXCX		P	X	Do.
NC-6769	KHVLO		P	X	National Park Airways (Inc.)
NC-6880	KHVMN		P	X	Do.
NC-7048	KHVMN		P	X	Do.
NC-10356	KHVIR		P	X	Do.
NR-914 (Aloha)	KHNBY		P	X	John B. Brennan, jr.

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 Port Lifeboat	WUAP		O	X	U. S. Army.
Republic Starboard Lifeboat	WUAS		O	X	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]

Block Island Southeast Light Station, R. I.—Loc., 71° 33' 08'' W., 41° 09' 10'' N.; transmits every 180 seconds groups of 2 dots, 1 dash, and 1 dot, for 60 seconds; silent 120 seconds, thus:

••••• etc.

60 seconds

Silent

120 seconds

Fy., 307 (977); hours, transmits daily in clear weather the second 15 minutes of each hour and continuously during thick or foggy weather (75th 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
KDJN	American Traveler.....b	KHVLO	NC-6769.....a
KGPX	Denver, Colo.....fx	KHVMN	NC-6880.....a
KGTE	Wichita, Kans.....fa	KHVMN	NC-7048.....a
KGTI	Salt Lake City, Utah (airport)....fa	KHXCX	NC-415H.....a
KGUW	St. Louis, Mo. (Lambert Field)....fa	KHXDW	NC-412H.....a
KGVU	Kansas City, Mo. (municipal air- port).....fa	WGEJ	Chelona.....b
KGUX	Dallas, Tex. (Love Field).....fa	WGEN	Mariposa.....b
KGUY	Oakland, Calif. (Oakland airport)....fa	WSDU	Boston, Mass. (municipal airport)....fa
KGUZ	Ponca City, Okla. (municipal airport)fa	WSDV	Columbus, Ohio (municipal airport)fa
KGYO	San Bruno, Calif.....fa	WSDW	Newark, N. J. (Newark airport)....fa
KHNBY	NR-914 (Aloha).....a	WSDX	Cleveland, Ohio (municipal airport).fa
KHVIR	NC-10356.....a	WSDY	Atlanta, Ga. (Candler Field).....fa
KHVJQ	NC-326N.....a	WUAP	Republic Port Lifeboat.....b
KHVKP	NC-330N.....a	WUAS	Republic Starboard Lifeboat.....b

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
California: San Francisco.....	W6XB	11,640 (25.77), 19,340 (15.512)---	1,500	Press Wireless (Inc.). American Telephone & Telegraph Co.
New Jersey: Ocean Gate.....	W2XX	10,550 (28.44), 16,270 (18.439), 21,420 (14.006).	20,000	
<i>Portable</i>				
Wisconsin: Milwaukee.....	W9XC	43,500 (6.9).....	75	The Journal Co. (Milwaukee Journal).

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

Call signal	District and station	Call signal	District and station
W2XX W6XB	Second district: Ocean Gate, N. J. Sixth district: San Francisco, Calif.	W9XC	Ninth district: Milwaukee, Wis. (portable).

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]

- ATLANTA, GA. WEEA.—Fy., add 2,964 (101.21), 5,840 (51.37).
 ATLANTIC CITY, N. J.—Type, add A2; fy., add 2,964 (101.21), 5,840 (51.37).
 BALTIMORE, MD. (LOGAN FIELD).—Fy., add 2,964 (101.21), 5,840 (51.37).
 BECHAROF, ALASKA RADIO.—Rates, 5 cents (25 centimes) per word; minimum 10 words.
 BELLEFONTE, PA.—Fy., add 3,182.5 (94.26).
 CHARLESTON, S. C.—Fy., add 2,964 (101.21), 5,840 (51.37); power, 18/3.
 CHICAGO, ILL. (MUNICIPAL AIRPORT) WUCG.—Fy., add 3,182.5 (94.26); power, 18/3.
 CLARKS POINT, ALASKA RADIO.—Rates, 5 cents (25 centimes) per word; minimum 10 words.
 CLEARWATER, CALIF. (LOS ANGELES) RADIO KOK.—Fy., strike out 8,670 (34.6) 16,900 (17.751), add 8,370 (35.84), 16,800 (17.85).
 CLEVELAND, OHIO WNAK.—Fy., add 3,182.5 (94.26); power, 18/3.
 GREENSBORO, N. C.—Fy., add 2,964 (101.21), 5,840 (51.37).
 HILLSBORO, OREG., RADIO KEK.—Fy., strike out 6,560 (45.73), 11,320 (26.5), add 6,260 (47.92), 11,130 (26.95).
 JACKSONVILLE, FLA.—Fy., add 2,964 (101.21), 5,840 (51.37).
 KVICHAK, ALASKA RADIO.—Rates, 8 cents (40 centimes) per word.
 LINDEN, N. J. (NEAR).—Type, add A2; fy., add 2,964 (101.21), 5,840 (51.37).
 MCRAE, GA. (AIRPORT).—Type, add A2; fy., add 2,964 (101.21), 5,840 (51.37).
 MILLS FIELD, CALIF. (NEAR).—Loc. (approximate) 122° 30' 00" W., 36° 30' 00" N.
 MOLINE, ILL. (AIRPORT).—Fy., add 3,182.5 (94.26); power, 18/3.
 NEWARK, N. J. WNAO.—Fy., add 3,182.5 (94.26).
 NUSHAGAK, ALASKA RADIO.—Rates, 8 cents per word.
 OKLAHOMA CITY, OKLA. (MUNICIPAL AIRPORT) KNAV.—Fy., add 3,182.5 (94.26); power, 18/3.
 ORLANDO TOWNSHIP, ILL.—Fy., add 3,182.5 (94.26).
 PALO ALTO, CALIF. (NEAR) RADIO KFS.—Fy., strike out 8,690 (34.52), 13,060 (22.97), add 8,380 (35.8), 12,555 (23.9), 16,800 (17.85).
 RICHMOND, VA.—Fy., add 2,964 (101.21), 5,840 (51.37).
 SAN ANTONIO, TEX. (WINBURN FIELD).—Class, add FA; power, 18/3.
 SAN FRANCISCO, CALIF., RADIOTELEPHONE.—Loc., changed to San Rafael, Calif. (near) 122° 27' 17" W., 37° 58' 53" N.; fy., strike out 2,542 (118.01), add 2,550 (117.6).

- SAYVILLE, N. Y., RADIO.—Fy., strike out 13,060 (22.97), 16,900 (17.75), add 8,390 (35.76), 12,585 (23.84), 16,780 (17.87).
 SPARTANBURG, S. C.—Fy., add 2,964 (101.21), 5,840 (51.37).
 SYRACUSE, N. Y. WPEA.—Fy., strike out 1,712 (175.23), add 2,458 (122.05).
 TOLEDO, OHIO WNAJ.—Fy., add 3,182.5 (94.26).
 TYEE, ALASKA RADIO.—Rates, 6 cents (30 centimes) per word.
 WEST PALM BEACH, FLA., RADIO WMR.—Fy., strike out 8,690 (34.52), 11,320 (26.5), add 8,380 (35.8), 11,130 (26.95).
 WILMINGTON, CALIF., RADIOTELEPHONE.—Loc., changed to San Pedro, Calif. (near) 118° 20' 11" W., 33° 43' 33" N.
 Strike out all particulars of the following-named stations: Dearborn, Mich. WQDW; Fort Worth, Tex. (Meacham Field) KGUC; Lansing, Ill. WCQ, Orlando Township, Ill.

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]

- AFONDRIA.—Accts., M. R. T. Co.; owner, Waterman S. S. Corporation.
 ALA.—Accts., M. R. T. Co.
 ALGONQUIN KDKH.—Owner, Standard Vacuum Transportation Co. (Inc.).
 AMBRIDGE.—Accts., M. R. T. Co.; owner, American Diamond Lines (Inc.).
 ANNISTON CITY.—Fy., strike out 159 (1,885).
 ANTIPOUS.—Accts., M. R. T. Co.; owner, Waterman S. S. Corporation.
 ARCHER.—Name changed to City of Newport News; 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); accts., M. R. T. Co.
 BARRENFORK.—Accts., Marine Contracting & Towing Co.
 CITY OF ALTON.—Accts., M. R. T. Co.; owner, American Diamond Lines (Inc.).
 CITY OF FORT WORTH.—Power, 27/5.5.
 CITY OF SAGINAW 31.—Power, 30/4.5.
 DILWORTH.—Fy., add 400 (750).
 EGLANTINE.—Accts., R. M. C. A.
 ENCHANTRESS.—Type, strike out B, add A2; fy., strike out 410 (730), 454 (660), add 468 (640); power, 18/2.25; service, strike out P, add PG; rates, 8 cents per word.
 ENDICOTT.—Accts., R. M. C. A.
 ESPARTA.—Hours, strike out N, add X.
 FORTITUDE.—Fy., add 3,105 (96.61), 3,115 (96.3), 8,280 (36.23), 8,290 (36.19), 8,450 (35.5), 11,050 (27.15), 11,110 (27), 11,230 (26.71), 13,240 (22.66), 16,580 (18.094), 16,660 (18.007), 16,860 (17.794); accts., R. M. C. A.
 FRANCES WEEMS.—Power, 22/7.
 HANOVER.—Accts., R. M. C. A.
 HASTINGS.—Owner, Waterman S. S. Corporation.
 INNOKO.—Accts., M. R. T. Co.; owner, American Diamond Lines (Inc.).
 JAVA ARROW.—Owner, Standard Vacuum Transportation Co. (Inc.).
 JOHN D. ARCHBOLD.—Fy., strike out 143 (2,100), 151 (1,985), 153 (1,960), 157 (1,910), 159 (1,885), 160 (1,875).
 JOHN PURROY MITCHELL.—Correct orthography, John Purroy Mitchel.
 KENOWIS.—Type, A arc; fy., 143 (2,100), 151 (1,985), 153 (1,960), 157 (1,910), 160 (1,875), 375 (800), 425 (705), 500 (600); power, 20/5; rates, 8 cents per word.
 LEVANT ARROW.—Owner, Standard Vacuum Transportation Co. (Inc.).
 LIEBRE.—Owner, Standard Vacuum Transportation Co. (Inc.).
 MAIDEN CREEK.—Accts., M. R. T. Co.; owner, Waterman S. S. Corporation.
 MALANG.—Fy., add 425 (705).
 NEW BRITAIN.—Accts., M. R. T. Co.
 PENNSYLVANIA KUSG.—Accts., States S. S. Co.
 POINT SUR.—Owner, Gulf Pacific Mail Line, (Ltd.) (Inc.).
 RAWLEIGH WARNER.—Owner, Sabine Transportation Co. (Inc.).
 ROBERT JOHNSON.—Name changed to Hubert Schafer; owner, Schafer Brothers Lumber & Shingle Co. (Inc.).
 SACANDAGA.—Accts., M. R. T. Co.; owner, American Diamond Lines (Inc.).
 SAC CITY.—Accts., M. R. T. Co.; owner, American Diamond Lines (Inc.).
 SACO.—Accts., M. R. T. Co.; owner, American Diamond Lines (Inc.).

- SAGE BRUSH.—Accts., M. R. T. Co.
 SARAMACCA.—Fy., add 157 (1,910), 410 (730).
 SHELTON.—Accts., Tacoma Oriental S. S. Co.
 SOUTHERN CROSS.—Accts., M. R. T. Co.
 SURAILCO.—Fy., strike out 410 (730), 454 (660); owner, Portland California S. S. Co.
 THALIA.—Fy., add 8,240 (36.41), 8,250 (36.36), 8,280 (36.23), 8,290 (36.19), 8,330 (36.01), 11,025 (26.96), 11,040 (27.17), 11,055 (27.13), 11,070 (27.1), 11,085 (27.06), 12,360 (24.27), 12,375 (24.24), 12,420 (24.15), 12,435 (24.13), 16,480 (18.204), 16,500 (18.182), 16,560 (18.116), 16,580 (18.094), 16,660 (18.007).
 VIGILANT.—Power, 31/3.
 WEST ARROW.—Owner, American Diamond Lines (Inc.).
 WEST ELDARA.—Accts., M. R. T. Co.; owner, American Diamond Lines (Inc.).
 WEST HIKA.—Accts., M. R. T. Co.; owner, Waterman S. S. Corporation.
 WEST KYSKA.—Fy., strike out 454 (660); accts., M. R. T. Co.
 WEST MADAKET.—Accts., M. R. T. Co.; owner, Waterman S. S. Corporation.
 WEST NOHNO.—Accts., M. R. T. Co.; owner, Waterman S. S. Corporation.
 WHITESPRAY.—Type, A1, A2; fy., 2,330 (128.8), 3,105 (96.61), 3,115 (96.3), 8,280 (36.23), 8,330 (36.01); power, 12/1.
 WILLZIPO.—Accts., Williams S. S. Co.
 WYTHEVILLE.—Accts., M. R. T. Co.; owner, American Diamond Lines (Inc.).
 Strike out all particulars of the following-named stations: Albacore, Barwick, Carrie-Finn, Claremont, Dawn Star, Doodeen, Elaine, Eleanor Boling, Eleu, Eloise, Eunice, Gavine, Halcyon, Harbor, Henry W. Card, Hualalai, Humuula, Marina, Multnomah, Quest, Republic Lifeboat No. 17, Republic Lifeboat No. 18, Resource, Roland, San Diego KUBF, Sphynx, Turbese, Virago.

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-178E, C-179E, C-183E, C-185E, C-187E, C-188E, C-189E, C-190E, C-224M
 C-268, C-269, C-270, C-272, C-273, C-274, C-276, C-277, C-279, C-281.—
 Fy., strike out 3,142 (95.48), add 3,160 (94.9), 3,166 (94.75), 3,172 (94.57),
 3,178 (94.39), 3,182.5 (94.26), 5,570 (53.86).
 C-283.—Fy., strike out 2,506 (119.71), 3,142 (95.48), 4,188 (71.62), 5,585 (53.71),
 add 3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178 (94.39), 3,182.5 (94.26),
 5,570 (53.86).
 C-284, C-285, C-286, C-287, C-288, C-290, C-291.—Fy., strike out 3,142
 (95.48), add 3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178 (94.39), 3,182.5
 (94.26), 5,570 (53.86).
 C-292.—Fy., strike out 2,506 (119.71), 3,142 (95.48), 4,188 (71.62), 5,585 (53.71),
 add 3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178 (94.39), 3,182.5 (94.26),
 5,570 (53.86).
 C-413E, C-415E, C-741K, C-743K, C-5389, C-5390, C-7135, C-7137.—Fy.,
 strike out 3,142 (95.48), add 3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178
 (94.39), 3,182.5 (94.26), 5,570 (53.86).
 C-7471.—Fy., add 3,160 (94.9), 3,166 (94.75), 3,178 (94.39), 3,182.5 (94.26),
 5,570 (53.86).
 NC-153H, NC-154H, NC-174H.—Licensee, American Airways (Inc.).
 NC-226M, NC-227M, NC-228M, NC-229M, NC-230M.—Fy., add 3,160
 (94.9), 3,166 (94.75), 3,178 (94.39), 3,182.5 (94.26), 5,570 (53.86).
 NC-231.—Fy., add 3,106 (96.59), 3,182.5 (94.26).
 NC-232M.—Fy., add 3,160 (94.9), 3,166 (94.75), 3,178 (94.39), 3,182.5 (94.26),
 5,570 (53.86).
 NC-234M.—Fy., add 3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178 (94.39),
 3,182.5 (94.26), 5,570 (53.86), 5,660 (53).
 NC-328N (No. 401 W. A. E.), NC-331N (No. 402 W. A. E.).—Fy., strike out
 3,460 (86.7), 6,350 (47.24), add 3,076 (97.5), 3,082 (97.33), 3,088 (97.15),
 5,510 (54.45), 5,540 (54.15).
 NC-333N (Fokker 2), NC-334N (Fokker 3).—Fy., strike out 6,350 (47.24),
 add 3,076 (97.5), 3,082 (97.33), 3,088 (97.15), 5,510 (54.45), 5,540 (54.15).
 NC-392E (F-109), NC-421E (No. 52 W. A. E.), NC-422E (No. 53 W. A. E.),
 NC-455E (F-110), NC-456E (F-111).—Fy., strike out 3,460 (86.7),
 6,350 (47.24), add 3,076 (97.5), 3,082 (97.33), 3,088 (97.15), 5,510 (54.45),
 5,540 (54.15).
 NC-539V.—Licensee, American Airways (Inc.).

- NC-582K (F-114), NC-583K (F-115).—Fy., strike out 3,460 (86.7), 6,350 (47.24), add 3,076 (97.5), 3,082 (97.33), 3,088 (97.15), 5,510 (54.45), 5,540 (54.15).
- NC-602V, NC-620V, NC-621V, NC-622V, NC-628V, NC-629V.—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-725W.—Fy., add 3,182.5 (94.26).
- NC-742K (No. 54).—Fy., strike out 3,460 (86.7), 6,350 (47.24), add 3,076 (97.5), 3,082 (97.33), 3,088 (97.15), 5,510 (54.45), 5,540 (54.15).
- NC-793K.—Fy., strike out 3,142 (95.48), add 3,160 (94.9), 3,166 (94.75), 3,172 (94.57), 3,178 (94.39), 3,182.5 (94.26), 5,570 (53.86).
- NC-842M.—Fy., add 3,160 (94.9), 3,166 (94.75), 3,178 (94.39), 3,182.5 (94.26), 5,570 (53.86).
- NC-843M (No. 55), NC-5170 (F-102), NC-8047 (F-105), NC-8048 (F-104).—Fy., strike out 3,460 (86.7), 6,350 (47.24), add 3,076 (97.5), 3,082 (97.33), 3,088 (97.15), 5,510 (54.45), 5,540 (54.15).
- NC-8485.—Type, add A1, A2; fy., 3,106 (96.59), 3,238 (92.64), 3,244 (92.47), 3,452 (86.9), 3,460 (86.7), 3,468 (86.5), 3,484 (86.1), 4,915 (61.03), 5,600 (53.57), 5,630 (53.29).
- NC-9153, NC-9193.—Licensee, American Airways (Inc.).
- NC-9666.—Type, A3; fy., 3,070 (97.71), 3,076 (97.5), 3,082 (97.33), 3,088 (97.15), 3,106 (96.59), 5,510 (54.45), 5,540 (54.15).
- NC-10351, NC-10352, NC-10355.—Fy., add 3,182.5 (94.26).
- Strike out all particulars of the following-named stations: NC-74-K (Three Johns), NC-432E (Juneau), NC-75K, NC-200E, NC-422H, NC-427H, No. 502 W. A. E., No. 503 W. A. E., No. 504 W. A. E., NC-982Y, NR-496M, 111N, X-657M.

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]

- CAMP JOHN HAY, P. I. (BAGUIO MOUNTAIN, LUZON).—Fy., 232 (1,281) *read* 232 (1,295).
- FORT DE RUSSY, P. I.—Strike out all particulars.
- FORT MCPHERSON, GA. (ATLANTA).—Loc. (approximate) 84° 23' 00'' W., 33° 45' 00'' N.
- KANAKANAK, ALASKA RADIO.—Fy., 555 (54.54) *read* 555 (54.05).
- QUARRY HEIGHTS (BALBOA), CANAL ZONE.—Fy., 17,020 (17.66) *read* 17,020 (17.626).

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]

- WILLETS POINT.—Name changed to Taylor.

AIRWAY 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]

- Strike out all particulars of the following-named stations: Dearborn, Mich.; Lansing, Ill.

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]

- CAPE ST. ELIAS LIGHT STATION, ALASKA.—Hours, operates continuously during clear weather from 10 to 20 and 40 to 50 minutes after each hour.

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

KLH, *read* San Rafael, Calif. (near) radiotelephone; KLUE, *read* Hubert Schafer; KOU, *read* San Pedro, Calif. (near) radiotelephone; WLCQ, *read* City of Newport News; WRBE, *read* John Purroy Mitchel; WYCX, *read* Taylor; strike out all particulars following the call signals KFIH, KFVT, KGDC, KGOE, KGUC, KHCBY, KHCZA, KHELO, KHFKP, KHIFU, KHILO, KHIPK, KHIUF, KHKIR, KHOAZ, KHSIR, KHSNM, KHVBY, KOBR, KSNA, KSNB, KSNB, KUBD, KUBF, WBEX, WBEY, WCDT, WCBQ, WDEA, WDEN, WFAT, WFO, WGDY, WHDY, WHDZ, WIDB, WIDD, WIDP, WJDH, WJDT, WKCU, WMBP, WMDD, WNAT, WQBM, WQDW, WTBD.

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]

KCRJ (Jerome, Ariz.).—Hours, daytime only.
 KFJY (Fort Dodge—Riverdale, Iowa).—Licensee, Cedar Rapids Broadcast Co.
 KFOR (Lincoln, Nebr.).—Loc., 96° 40' 19" W., 40° 48' 41" N.
 KFXV (Flagstaff, Ariz.).—Post-office address changed to 117 North Beaver St.
 KGFF (Shawnee, Okla.).—Loc., 96° 51' 48" W., 35° 25' 30" N.
 KGJF (Little Rock, Ark.).—Call changed to KARK.
 KIDO (Boise, Idaho).—Fy., 1,350 (222.2)
 KMLB (Monroe, La.).—Studio changed to Hotel Virginia.
 KTAB (Oakland, Calif.).—Post-office address, 214 South Vermont Avenue, Los Angeles, Calif.
 KUT (Austin, Tex.).—Licensee, KUT Broadcasting Co.
 KWK (Kirkwood, Mo.).—Licensee, Thomas Patrick (Inc.).
 WALR (Zanesville, Ohio).—Transmitter location changed to East Pike, Zanesville, Ohio.
 WBEO (Marquette, Mich.).—Loc., 87° 23' 40" W., 46° 32' 38" N.
 WBSO (Needham, Mass.).—Licensee, Broadcasting Service Organization (Inc.).
 WCAX (Burlington, Vt.).—Transmitter, studio, and post-office address changed to loc. (approximate), 73° 12' 00" W., 44° 29' 00" N., 197 College St.
 WELK (Philadelphia, Pa.).—Call changed to WDAS.
 WFDF (Flint, Mich.).—Loc. (approximate) 83° 41' 30" W., 43° 01' 00" N.
 WHBU (Anderson, Ind.).—Licensee, Anderson Broadcasting Corporation.
 WJAK (Marion, Ind.).—Transmitter, studio, and post-office address changed to Elkhart, Ind., loc., 85° 57' 16" W., 41° 40' 30" N., Elkhart Hotel.
 WJBK (Highland Park, Mich.).—Post-office address changed to 6559 Hamilton Avenue, Detroit, Mich.
 WMBO (Auburn, N. Y.).—Licensee, WMBO (Inc.).
 WROL (Knoxville, Tenn.).—Loc., 83° 56' 14" W., 35° 57' 21" N.
 WSAI (Mason, Ohio).—Power, 500 night, 1,000 day.
 WSYB (Rutland, Vt.).—Post-office address changed to 80 West St.
 WTJS (Jackson, Tenn.).—Loc. (approximate) 88° 55' 00" W., 35° 37' 00" N.
 WTSL (Shreveport, La.).—Transmitter, studio, and post-office address changed to Laurel, Miss., loc. (approximate), 89° 08' 00" W., 31° 44' 00" N., 429 Magnolia St.
 Strike out all particulars of the following names stations: WIBR (Steubenville, Ohio); WJAZ (Mt. Prospect, Ill.).

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]

Louisiana: Shreveport W9XX.—Call changed to W5XA.

Portable

United States—throughout W10XAC.—Loc., changed to New York, N. Y.; class changed to relay broadcasting (portable).

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]

New Jersey: Coytesville W2XAL.—Loc., changed to Boston, Mass.; call changed to W1XAL.
 Pennsylvania: Philadelphia (Byberry) W3XAU.—Loc., changed to Newton Township, Pa.

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		
City of Newport News.....	WLCQ	Baltimore Mail S. S. Co. (Inc.).
Golden Coast.....	KUQJ	Oceanic & Oriental Navigation Co.
Golden Eagle.....	KIFP	Do.
Golden Harvest.....	KUMM	Do.
Seaforth.....	KFZQ	H. W. Falk.
Sonoma.....	WBDT	Oceanic S. S. Co.

The radio compass has been removed from the SS Admiral Schley (WGCI).

LISTS OF RADIO STATIONS AVAILABLE FOR DISTRIBUTION

The Superintendent of Documents, Government Printing Office, Washington D. C., now has available for distribution the annual lists of Commercial and Government Radio Stations of the United States and Amateur Radio Stations of the United States, both as of June 30, 1931. The price of the first-named list has been increased from 15 to 20 cents a copy and the amateur list has been increased from 25 to 35 cents a copy. The increase in the price of these publications is due to the increased size of both. The Commercial and Government list contains all commercial and Government land, ship, direction-finding, radio-beacon, broadcasting, relay broadcasting, visual broadcasting (television), experimental and, in addition, stations transmitting time signals, weather reports, hydrographic reports, etc. The amateur list contains the call signal, name of the licensee, and location of the 22,739 amateur stations.

All remittances should be made to the Superintendent of Documents, preferably by postal money order and forwarded to the Government Printing Office. *Do not send remittances to the Department of Commerce.*

ANNUAL REPORT OF RADIO DIVISION AVAILABLE FOR DISTRIBUTION

The Annual Report of the Director of Radio for the fiscal year 1931, may be obtained from the Superintendent of Documents, Government Printing Office, this city, at 5 cents a copy. This report contains statistical tables showing the number of the different classes of radio stations, radio operators examined and licensed, ship inspections, etc., as well as a resume of the work of the radio division during the past fiscal year.

All remittances should be made to the Superintendent of Documents, Government Printing Office, Washington, D. C. *Do not send remittances to the Department of Commerce.*

INTERNATIONAL LISTS OF RADIO STATIONS AVAILABLE FOR DISTRIBUTION

The International Bureau of the Telegraph Union, Radiotelegraph Service, Berne, Switzerland, now has available for distribution, the third editions of the lists of Fixed and Land Stations and Ship Stations. These lists contain data of stations of all countries which are members of the International Convention. The price of the first-named list is 10 francs, 70 centimes, Swiss gold (\$2.07) and

the ship station list is 12 francs, Swiss gold (\$2.32). All remittances should be made to the Berne Bureau, preferably by international money order. *Do not send remittances to the Department of Commerce as it does not have anything to do with the distribution.*

RATIFICATIONS OF THE INTERNATIONAL RADIO CONVENTION

Brazil and Iraq ratified the International Radio Convention, Washington, 1927, on October 27 and October 10, 1931, respectively.

RUSSIAN STANDARD TIME CHANGED

Summer or daylight saving time in Russia (Soviet Union), viz., one hour in advance of the time of the standard meridian, will be kept all the year round, irrespective of summer or winter until further notice.

BROADCASTING STATION FREQUENCY MEASUREMENTS DURING OCTOBER

The frequency monitoring stations of the Radio Division measured more broadcasting stations during October than any other previous month; 381 stations were measured in comparison with 328 during September and 367 during February, the next highest month. One hundred and thirty-six, or 35.7 per cent of the number measured, deviated less than 50 cycles; 97, or 25.4 per cent, deviated more than 50 cycles but less than 100 cycles; 72, or 18.9 per cent, deviated more than 100 cycles but less than 200 cycles; and the remaining 76, or 20 per cent, deviated more than 200 cycles. In the compilation of these figures, a station to be included in the class deviating under 50 cycles must have at no time exceeded that mark. If it went over 50 cycles but under 100, it is included in the list deviating under 100 cycles. The same procedure is followed for those shown in the classes under 200 and over 200 cycles. The figures, consequently, do not indicate the average deviations.

In comparison with August, the best month so far, when 117, or 38.5 per cent deviated under 50 cycles (the maximum deviation allowance beginning June, 1932), the October figures show 136, or 35.7 per cent.

At the present time stations are allowed a permissible tolerance of 500 cycles. The table hereunder gives the figures for all the months during which this data has been published. As only 381 out of the 609 (or about two-thirds of all) broadcasting stations were measured during October, it must be borne in mind that many of those not included in the lists given hereunder are maintaining their frequency assignment although they are not mentioned due to their not being measured on account of their low power. Of course, these stations are measured from time to time by radio test cars traveling through remote areas.

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

Month	Number measured	Under 50	Under 100	Under 200	Over 200
1930					
December	339		85 (13.5%)	66 (16.5%)	288 (70%)
1931					
January	363		54 (15%)	102 (27%)	207 (58%)
February	367		99 (27%)	55 (15%)	213 (58%)
March	337	65 (19.3%)	63 (18.8%)	77 (22.8%)	132 (39.1%)
April	314	72 (22.9%)	54 (17.2%)	92 (29.3%)	96 (30.6%)
May	326	78 (23.9%)	89 (27.3%)	68 (20.9%)	91 (27.9%)
June	330	97 (29.4%)	71 (21.5%)	69 (20.9%)	93 (28.2%)
July	294	94 (32%)	70 (23.8%)	60 (20.4%)	70 (23.8%)
August	304	117 (38.5%)	64 (21%)	67 (22%)	56 (18.5%)
September	328	115 (35%)	72 (22%)	68 (21%)	73 (22%)
October	381	136 (35.7%)	97 (25.4%)	72 (18.9%)	76 (20%)

LESS THAN 50 CYCLES

Call signal	Transmitter location, studio location in parentheses	Call signal	Transmitter location, studio location in parentheses
KELW	Burbank, Calif.	WCAP	Asbury Park, N. J.
KFAC	Los Angeles, Calif.	WCBM	Baltimore, Md.
KFDM	Beaumont, Tex.	WCFL	Chicago, Ill.
KFEQ	St. Joseph, Mo.	WCKY	Crescent Springs, Ky. (Covington).
KFI	Los Angeles, Calif.	WCRW	Chicago, Ill.
KFIJ	Oklahoma City, Okla.	WCRH	Scarboro, Me. (Portland).
KFKX	} Bloomington, Ill. (Chicago).	WDBO	Orlando, Fla.
KYW		WDBG	Minneapolis, Minn.
KFLV	Rockford, Ill.	WEAF	Bellmore, N. Y. (New York City).
KFOR	Lincoln, Nebr.	WEAN	Providence, R. I.
KFPY	Spokane, Wash.	WEEL	Weymouth, Mass. (Boston).
KFSB	San Diego, Calif.	WEVD	Forest Hills, N. Y. (New York City).
KFSG	Los Angeles, Calif.	WFAA	Grapevine, Tex. (Dallas).
KFUO	Clayton, Mo.	WFAM	South Bend, Ind.
KFVD	Culver City, Calif.	WFAN	} Philadelphia, Pa.
KFWB	Hollywood, Calif.	WIF	
KFYR	Bismarck, N. Dak.	WIFL	Philadelphia, Pa.
KGBX	St. Joseph, Mo.	WFO	Brooklyn, N. Y.
KGBZ	York, Nebr.	WFOG	Mississippi City, Miss. (Gulfport).
KGEF	Los Angeles, Calif.	WGES	Chicago, Ill.
KGFJ	Do.	WGR	Amherst, N. Y. (Buffalo).
KGRS	Amarillo, Tex.	WGY	Schenectady, N. Y.
KGW	Faloma, Oreg. (Portland).	WHAP	New York, N. Y.
KHQ	Spokane, Wash.	WHAS	Louisville, Ky.
KJR	Seattle, Wash.	WHAZ	Troy, N. Y.
KLX	Oakland, Calif.	WHB	Kansas City, Mo.
KLZ	Denver, Colo.	WHBF	Rock Island, Ill.
KMO	Tacoma, Wash.	WHN	New York, N. Y.
KMOX	St. Louis, Mo.	WHO	Des Moines, Iowa.
KMPC	Beverly Hills, Calif.	WHP	Lemoynne, Pa. (Harrisburg).
KMTR	Los Angeles, Calif.	WIBU	Poynette, Iowa.
KNX	Los Angeles, Calif. (Hollywood).	WIBW	Topeka, Kans.
KOA	Denver, Colo.	WILM	Carrcroft-Edgemoor, Del. (Wilmington).
KOAC	Corvallis, Oreg.	WISN	Milwaukee, Wis.
KOH	Reno, Nev.	WJAZ	Mt. Prospect, Ill. (Chicago).
KOMO	Harbor Island, Wash. (Seattle).	WJBC	La Salle, Ill.
KOY	Phoenix, Ariz.	WJR	Sylvan Lake Village, Mich. (Detroit).
KPCB	Seattle, Wash.	WJSV	Mt. Vernon Hills, Va. (Alexandria).
KPO	San Francisco, Calif.	WJZ	Bound Brook, N. J. (New York City).
KPPC	Pasadena, Calif.	WKBH	La Crosse, Wis.
KRLD	Dallas, Tex.	WKRC	Cincinnati, Ohio.
KRSC	Seattle, Wash.	WLBF	Kansas City, Mo.
KSAC	Manhattan, Kans.	WLBZ	Bangor, Me.
KSD	St. Louis, Mo.	WLOE	Chelsea, Mass. (Boston).
KSL	Salt Lake City, Utah.	WLS	Downers Grove, Ill. (Chicago).
KSOO	Sioux Falls, S. Dak.	WMBC	Detroit, Mich.
KTAR	Phoenix, Ariz.	WMSG	New York, N. Y.
KTRH	Houston, Tex.	WNAX	Yankton, S. Dak.
KTSM	El Paso, Tex.	WNBH	Fair Haven, Mass. (New Bedford).
KVOS	Bellingham, Wash.	WQAI	Selma, Tex. (San Antonio).
KWCR	Cedar Rapids, Iowa.	WOC	Davenport, Iowa.
KXA	Seattle, Wash.	WOW	Omaha, Nebr.
KXO	El Centro, Calif.	WOWO	Fort Wayne, Ind.
WAAB	Lexington, Mass.	WPCC	Chicago, Ill.
WAAF	Chicago, Ill.	WPOR	} Norfolk, Va.
WAAM	Newark, N. J.	WPTA	
WABO	} Rochester, N. Y.	WPTF	Philadelphia, Pa.
WHEC		Tallmadge, Ohio.	WRAC
WADC	Birmingham, Ala.	WREC	Whitehaven, Tenn. (Memphis).
WAPI	Grand Rapids, Mich.	WRHM	Fridley, Minn. (Minneapolis).
WASH	Zarepath, N. J.	WRJN	Racine, Wis.
WAWZ	Glenview, Ill. (Chicago).	WSB	Atlanta, Ga.
WBBM	Martinsville, N. Y. (Buffalo).	WSBT	South Bend, Ind.
WBEN	Needham, Mass.	WSEN	Columbus, Ohio.
WBSO	Charlotte, N. C.	WSUI	Iowa City, Iowa.
WBT	} Millis Township, Mass. (Boston).	WTAG	Worcester, Mass.
WBZ		Columbus, Ohio.	WTAM
WBZA	Northfield, Minn.	WTMJ	Brookfield, Wis. (Milwaukee).
WCAH	Camden, N. J.		
WCAL			
WCAM			

LESS THAN 100 CYCLES

KDKA	Saxonburg, Pa. (Pittsburgh).	KFOX	Long Beach, Calif.
KDYL	Salt Lake City, Utah.	KFQU	Alma-Holy City, Calif.
KFAB	Lincoln, Nebr.	KFRC	San Francisco, Calif.
KFBB	Great Falls, Mont.	KFVS	Cape Girardeau, Mo.
KFEL	Denver, Colo.	KFVI	San Francisco, Calif.
KFJI	Astoria, Oreg.	KFXF	Denver, Colo.
KFNF	Shenandoah, Iowa.	KGA	Spokane, Wash.

LESS THAN 100 CYCLES—Continued

Call signal	Transmitter location, studio location in parentheses	Call signal	Transmitter location, studio location in parentheses
KGB	San Diego, Calif.	WFBR	Baltimore, Md.
KGER	Long Beach, Calif.	WGN	Elgin, Ill. (Chicago).
KGGF	Coffeyville, Okla.	WHAM	Rochester, N. Y.
KGIZ	Grant City, Mo.	WHDH	Gloucester, Mass. (Boston).
KGO	Oakland, Calif. (San Francisco).	WHK	Village of Seven Hills, Ohio (Cleveland).
KICK	Red Oak, Iowa.	WJAR	Providence, R. I.
KMJ	Fresno, Calif.	WJAY	Cleveland, Ohio.
KMLB	Monroe, La.	WJBO	New Orleans, La.
KMMJ	Clay Center, Nebr.	Do.	Do.
KOIN	Portland, Oreg.	WJBW	Jackson, Miss.
KRGV	Harlingen, Tex.	WJDX	Mooseheart, Ill.
KROW	Richmond, Calif. (Oakland).	WJJD	Gary, Ind.
KSO	Clarinda, Iowa.	WJKS	Oglethorpe University, Ga.
KTAT	Birdville, Tex. (Fort Worth).	WJTL	Joliet, Ill.
KTBR	Portland, Oreg.	WKBB	Chicago, Ill.
KTBS	Shreveport, La.	WKBN	Youngstown, Ohio.
KTHS	Hot Springs, Ark.	WKWB	Connersville, Ind.
KTM	Santa Monica, Calif. (Los Angeles).	WKBW	Amherst, N. Y. (Buffalo).
KUJ	Walla Walla, Wash.	WKY	Oklahoma City, Okla.
KVOO	Tulsa, Okla.	WLAC	Nashville, Tenn.
KVOR	Colorado Springs, Colo.	WLBC	Muncie, Ind.
KWJJ	Portland, Oreg.	WLEY	Lexington, Mass.
KWKH	Kennonwood, La. (Shreveport).	WLW	Mason, Ohio (Cincinnati).
KYA	San Francisco, Calif.	WMAQ	Addison, Ill. (Chicago).
WBAL	Glen Morris, Md. (Baltimore).	Do.	Do.
WBAP	Grapevine, Tex. (Fort Worth).	WMBI	Hoboken, N. J. (New York City).
WBBR	Rossville, N. Y. (Brooklyn).	WMCA	Waterloo, Iowa.
WCAU	Byberry, Pa. (Philadelphia).	WMT	New York, N. Y.
WCAZ	Carthage, Ill.	WNYC	Paterson, N. J.
WCBS	Springfield, Ill.	WODA	Ames, Iowa.
WCCO	Anoka, Minn. (Minneapolis).	WOI	Atlantic City, N. J.
WCDA	Cliffside Park, N. J. (New York City).	WPG	Providence, R. I.
WCHI	Deerfield, Ill. (Chicago).	WPRO	Coytesville, N. J. (New York City).
WCLE	Joliet, Ill.	WRNY	Gainesville, Fla.
WDAE	Tampa, Fla.	WRUF	Fall River, Mass.
WDAF	Kansas City, Mo.	WSAR	Nashville, Tenn.
WDAG	Amarillo, Tex.	WSM	New Orleans, La.
WDAY	Fargo, N. Dak.	WSMB	Springfield, Ill.
WDSU	Gretna, La. (New Orleans).	WTAX	Mt. Avon, Conn. (Hartford).
WEBC	Superior, Wis.	WTIC	Wheeling, W. Va.
WEDC	Chicago, Ill.	WVVA	Detroit, Mich.
WENR	Downers Grove, Ill. (Chicago).	WXYZ	

LESS THAN 200 CYCLES

KBPS	Portland, Oreg.	WDBJ	Roanoke, Va.
KEX	Do.	WDEL	Wilmington, Del.
KFBK	Sacramento, Calif.	WDOD	Brainerd, Tenn. (Chattanooga).
KFH	Wichita, Kans.	WDRC	Bloomfield, Conn. (Hartford).
KFIZ	Fond du Lac, Wis.	WEAO	Columbus, Ohio.
KFXM	San Bernardino, Calif.	WELK	Philadelphia, Pa.
KGDM	Stockton, Calif.	WEXL	Royal Oak, Mich.
KGGO	San Francisco, Calif.	WGAR	Cuyahoga Heights, Ohio (Cleveland).
KGHL	Billings, Mont.	WHFC	Cicero, Ill.
KGKY	Scottsbluff, Nebr.	WIAS	Ottumwa, Iowa.
KID	Idaho Falls, Idaho.	WIBO	Desplaines, Ill. (Chicago).
KLO	Ogden, Utah.	WIL	St. Louis, Mo.
KMA	Shenandoah, Iowa.	WJAG	Norfolk, Nebr.
KMBC	Independence, Mo. (Kansas City, Mo.).	WJAS	Pittsburgh, Pa.
KMCS	Inglewood, Calif.	WKBF	Clermont, Ind. (Indianapolis).
KOIL	Council Bluffs, Iowa.	WKZO	Kalamazoo, Mich.
KOL	Seattle, Wash.	WLAP	Louisville, Ky.
KOPRC	Houston, Tex.	WLBW	Oil City, Pa.
KQW	San Jose, Calif.	WMBD	Peoria Heights, Ill.
KRE	Berkeley, Calif.	WMBH	Joplin, Mo.
KREG	Santa Ana, Calif.	WMC	Bartlett, Tenn. (Memphis).
KSCJ	Sioux City, Iowa.	WNAC	Quincy, Mass. (Boston).
KSEI	Pocatello, Idaho.	WNAD	Norman, Okla.
KTAB	Oakland, Calif. (San Francisco).	WOMT	Manitowoc, Wis.
KTFI	Twin Falls, Idaho.	WOR	Kearny, N. J. (Newark).
KTSA	San Antonio, Tex.	WPAP	Cliffside, N. J. (New York City).
KTW	Seattle, Wash.	WQAO	Providence, R. I.
KUOA	Fayetteville, Ark.	WPCH	Hoboken, N. J. (New York City).
KVI	Des Moines, Wash. (Tacoma).	WRAC	Williamsport, Pa.
KWG	Stockton, Calif.	WRVA	Mechanicville, Va. (Richmond).
KWK	Kirkwood, Mo. (St. Louis).	WRSB	Chicago, Ill.
KXL	Portland, Oreg.	WSPD	Toledo, Ohio.
WAAW	Omaha, Nebr.	WTFI	Toccoa, Ga.
WABZ	New Orleans, La.	WWJ	Detroit, Mich.
WAIU	Columbus, Ohio.	WWRL	Woodside, N. Y.
WCAJ	Lincoln, Nebr.		
WCLO	Janesville, Wis.		

LIST OF CUBAN BROADCASTING STATIONS OF 100 WATTS AND OVER

Frequency in kilocycles (meters in parentheses)	Power (watts)	Call signal	Owner	Location
588 (510)	1,400	CMW	Columbus Com. and Radio Co.	Paseo de Martí número 103, Habana.
620 (483.6)	250	CMCJ	Rafael Rodríguez	Estévez número 4, Habana.
660 (454.3)	250	CMCO	John L. Stowers	Almendares número 58, Marianao.
	500	CMDC	Juan Fernández de Castro.	3ª Ave. esq. a 4, Marianao.
730 (410.8)	3,150	CMK	Cia. Nacional de Radio.	Hotel Plaza, Habana.
790 (379)	100	CMHC	Frank H. Jones	Central Tuinucú, Tuinucú.
	150	CMBS	Enrique Artalejo	Calzada y H. Vedado, Habana.
	150	CMBT	Emilio Perera	Consulado y Virtudes, Habana.
834 (360)	100	CMGA	Leopoldo V. Figueroa	Martí número 19, Colón.
840 (356.9)	500	CMC	Cuban Telephone Co.	Agulla y Dragones, Habana.
890 (336.9)	500	CMX	Francisco Lavin	San Lázaro número 99, Habana.
	250	CMCF	Raoul Karman	Rayo número 67, Habana.
925 (324.2)	250	CMCN	Antonio Ginard	Reina y Av. B. Retiro, Marianao.
	250	CMCD	Angel Bertematy	Av. de los Presidentes esq. a 25, Habana.
905 (315.6)	250	CMHD	Manuel Alvarez	María Escobar número 17, Caibarién.
965 (310.7)	150	CMBD	Luis Pérez García	Enamorados y Flores, S. Suárez, Habana.
	150	CMBC	Domingo Fernandez	Máximo Gómex número 139, Habana.
1,010 (296.8)	150	CMBZ	Manuel y G. Salas	San Rafael número 14, Habana.
	150	CMBW	Modesto Alvarez	A entre 6 y 8, La Sierra, Marianao.
3,034 (290)	150	CMKC	M. P. Martínez	Lacret y San Pedro, Stgo. de Cuba.
1,070 (280.2)	150	QMBG	Francisco Garrigó	Hospital número 100, Habana.
	150	CMCB	Antonio Capablanca	O'Reilly y Aguacate, Habana.
1,150 (260.7)	600	CMCQ	Andrés Martínez	Vista Alegre 80, Víbora, Habana.
	250	CMQ	José Fernández	25 número 445, Vedado, Habana.
1,225 (244.7)	350	CMBY	Callejas-Coscolluela	Príncipe número 33, Habana.
	150	CMCA	Manuel Cruz	Avenida de Italia número 102, Habana.
1,285 (233.4)	150	CMCU	Jorge García Serra	San Francisco 13, Víbora, Habana.
	150	CMCW	José Lorenzo	Ayesterán número 13, Habana.
1,345 (222.9)	150	CMCR	Aurelio Hernández	Milagros número 35, Víbora, Habana.
1,370 (218.7)	150	CMGH	Alberto Alvarez	Manzaneda número 33, Matanza.
1,382 (217)	100	CMJC	Feliciano Isaac	República número 145, Camaguey.

LIST OF MEXICAN BROADCASTING STATIONS ALPHABETICALLY BY CALL SIGNALS

Call signal	Owner	Location	Power (watts)	Frequency in kilocycles (meters in parentheses)
XEA	Alberto Palos Sanza	Guadalajara, Jalisco	100	1,000 (300)
XEB	El Buen Tono, S. A.	México, D. F.	1,000	1,030 (291.2)
XEC	Jesus R. Benavides	Toluca, Mex.	50	1,000 (300)
XED	Cia. Intl. Dif. Reynosa, S. A.	Reynosa, Tams.	10,000	965 (310.8)
XEE	Alfonso Zorrilla B.	Oaxaca, Oax.	105	1,000 (300)
XEG	Miguel Yarza	México, D. F.	100	1,360 (220.5)
XEH	Constantino, Tarnava.	Monterrey, N. L.	1,000	1,132 (265)
XEI	Carlos Gutierrez	Morelia, Mich.	100	1,000 (300)
XEJ	Juan G. Buttner	C. Juarez, Chih.	100	1,000 (300)
XEK	Arturo Martínez	México, D. F.	100	990 (303)
XEL	Antonio Garza Castro	Saltillo, Coah.	10	1,000 (300)
XEM	María T. de Gutierrez	México, D. F.	250	1,300 (230.7)
XEN	Cerveceria Modelo, S. A.	do	1,000	711 (421.9)
XEO	Partido Nacional Rev.	do	5,000	940 (319.1)
XEP	Asociacion Radiodifusora Latino-Americana, S. A.	N. Laredo, Tams.	200	1,400 (214.2)
XEQ	Feliciano Lopez Islas	C. Juarez, Chih.	5,000	750 (400)
XER	Cia. Radiodif. de Acuna, S. A.	Villa Acuna, Coah.	75,000	735 (408.1)
XES	Emilio Balli	Tampico, Tams.	500	890 (337)
XET	México, Music, Co., S. A.	Monterrey, N. L.	500	690 (434.7)
XEU	Fernando Pazos	Veracruz, Ver.	100	1,000 (300)
XEV	Ciro Molina	Puebla, Pue.	100	1,000 (300)
XEW	México, Music, Co., S. A.	México, D. F.	5,000	910 (329.6)
XEX	EXCELSIOR	do	500	1,210 (247.9)
XEY	Partido Socialista S. E.	Merida, Yuc.	105	1,000 (300)
XEZ	Joaquín Capilla	México, D. F.	500	780 (384.6)
XETA	Manuel Espinosa Tagle	do	500	1,140 (263.1)
XETF	Manuel Angel Fernandez	Veracruz, Ver.	500	630 (475.9)
XEFA	Manuel F. Murguía	México, D. F.	250	1,250 (240)
XEFE	Rafael T. Carranza	N. Laredo, Tams.	100	1,000 (300)

LIST OF MEXICAN BROADCASTING STATIONS ALPHABETICALLY BY CALL SIGNALS—
continued

Call signal	Owner	Location	Power (watts)	Frequency in kilocycles (meters in parentheses)
XETQ	Carlos G. Caballero.....	Mexico, D. F.....	100	1,230 (243.9)
XEFC	Hugo Molina Font.....	Merida, Yuc.....	10	1,050 (285.7)
XETC	Juventino Sanchez.....	Jalapa, Ver.....	100	1,000 (300)
XETG	Feliciano Lopez Islas.....	Torreón, Coah.....	100	1,000 (300)
XETB	Jose A. Berumen.....	do.....	125	1,380 (217)
XEFB	Quintanilla y Stevenson.....	Monterrey, N. L.....	50	1,270 (236.1)
XEFS	Salvador Sanchez.....	Queretaro, Qro.....	40	1,000 (300)
XEFI	Feliciano Lopez Islas.....	Chihuahua, Chih.....	100	1,000 (300)
XEFD	Carlos de la Sierra.....	Tijuana, B. C.....	300	1,020 (293.9)
XETZ	Manuel Zetina.....	Coyoacan, D. F.....	100	1,500 (199.9)

GOVERNMENT

XFC	Gobno. Edo. Aguascalientes.....	Aguascalientes, Ags.....	350	805 (372.6)
XFG	Sria de Guerra y Marina.....	Mexico, D. F.....	2,000	683.3 (470)
XFH	Sria de Guerra y Marina.....	do.....	250	
XFI	Sria Ind. Com. y Trabajo.....	do.....	1,000	818.1 (366.7)
XFX	Sria de Educacion Publica.....	do.....	500	860 (348.8)

RADIO TRANSMISSIONS OF STANDARD FREQUENCY; JANUARY, FEBRUARY, AND
MARCH, 1932

The Bureau of Standards announces a new schedule of radio transmissions of standard frequency. All transmissions are on 5,000 kilocycles. This service may be used by transmitting stations in adjusting their transmitters to exact frequency, and by the public in calibrating frequency standards and transmitting and receiving apparatus. The signals are transmitted from the bureau's station WWV, in a suburb east of Washington, D. C., every Tuesday afternoon and evening. They can be heard and utilized by stations equipped for continuous-wave reception throughout the United States, although not with certainty in some places. The accuracy of the frequency is at all times better than a part in a million.

The transmissions are by continuous-wave telegraphy at 5,000 kilocycles. They are given continuously from 2 to 4 p. m., and from 8 to 10 p. m., Eastern Standard Time, every Tuesday. The dates are January 5, 12, 19, 26; February 2, 9, 16, 23; and March 1, 8, 15, 22, 29.

The transmissions consist mainly of continuous, unkeyed carrier frequency, giving a continuous whistle in the phones when received with an oscillatory receiving set. The first five minutes of the transmission consist of the general call (CQ de WWV) and announcement of the frequency. The frequency and the call letters of the station (WWV) are given every 10 minutes thereafter.

Information on how to receive and utilize the signals may be obtained by addressing a request to the Bureau of Standards, Washington, D. C. From the 5,000 kilocycles any apparatus may be given as complete a frequency calibration as desired by the method of harmonics.

The bureau is desirous of receiving reports on these transmissions, especially because radio transmission phenomena change with the season of the year. The data desired are approximate field intensity, fading, and the suitability of the transmissions for frequency measurements. It is suggested that in reporting upon field intensities for these transmissions, the following designations be used where field intensity measurement apparatus is not at hand: (1) Hardly perceptible, nureadable; (2) weak, readable now and then; (3) fairly good, readable with difficulty; (4) good, readable; (5) very good, perfectly readable. A statement as to whether fading is present or not is desired, and if so, its characteristics, such as whether slow or rapid and time between peaks of signal intensity. Statements as to type of receiving set used in reporting on the transmissions and the type of antenna used are likewise desired. The bureau would also appreciate reports on the use of the transmissions for purposes of frequency measurement or control.

All reports and letters regarding the transmissions should be addressed Bureau of Standards, Washington, D. C.

PROGRESS IN AERONAUTIC RADIO RESEARCH

The development of various phases of radio receiving equipment for use on airplanes has been advanced by recent work of the Bureau of Standards. Detailed specifications have been prepared for receiving equipment to be used on airplanes to receive beacon signals of the visual type. These are timely in view of the installation of the visual type of radio range beacons on the midcontinent airway, from Amarillo to Los Angeles. The specifications include means for applying an automatic volume control unit to the airplane receiving sets at present in use, together with performance curves of the unit. Installations of receiving equipment as described in the specifications were made on several airplanes of the department, serving as model installations and as means of flight testing the visual radio range beacons.

Progress has been made in the design of a receiving set for use with the simultaneous radio phone and range beacon. The equipment hitherto available was not wholly suitable for this service, primarily because of inadequate audio-frequency characteristics and low power output. Experimental work has shown that an undistorted power output of 400 milliwatts is desirable to insure satisfactory service during conditions of severe atmospheric disturbances. Likewise it is essential that the receiving set has a uniform response for frequencies from 50 to 3,000 cycles. These receiving sets will be equipped with automatic volume control and will operate on the transmission from the simultaneous radio phone and visual range beacon, the visual range beacon, the airways radiophone service, and the aural range beacons.

A study has been made of the use which is often made of the airplane fuselage as a "ground" return lead between various portions of the radio circuits, in the installation of radio equipment on airplanes. Bolted connections to the fuselage have been known to loosen so that, during vibration, the electrical connection was of variable resistance. This resulted in noise in the receiving set output having the regularity and other characteristics of ignition interference. In other cases, the fuselage, although a completely welded type, offered a resistance to the flow of current equivalent to that of a direct wire connection of No. 14 American wire gage. The drop in battery voltage would depend upon the number of radio units in operation. Turning one set off or on would therefore affect the operation of whatever other radio unit was being used. The cure for difficulties of the type described is to provide a direct copper connection for ground return leads, particularly where such leads carry considerable current.

An improved method for calibrating the reed indicators used with the visual radiobeacon system has been developed. Hitherto the procedure has consisted of tuning each reed as closely as possible to the frequency desired and of adjusting the resonance curve of each reed so that its sharpness of resonance was equal to a predetermined value. The improvement now introduced in the calibration procedure consists of the addition of an over-all test whereby equal voltages of both reed frequencies are applied to the reed indicator (so that an "on-course" indication is obtained) and the two frequencies are simultaneously varied from minus to plus one-half per cent of their proper values. Any change from the on-course indication will then show that the resonance curves of the two reeds do not have the proper relation. The addition of this over-all test increases the accuracy of adjustment of the reed indicator under calibration, and reduces the amount of care needed in tuning the reeds.

Some simplifications have been made in the design of the aircraft direction finder previously reported. It was found possible to so arrange the input switching unit that only one loop antenna is required in place of the crossed loop antenna system previously employed. Besides the reduction in the number of loop antennas employed, there is additional simplification in the condenser arrangement used in the input unit. The direction of deviation from the indicated course is given the pilot by means of a zero-center pointer type course indicator. The use of the direction finder for taking cross bearings is at the same time made considerably easier through the elimination of the right-angle courses which were present with the crossed-loop antenna system.