

RADIO SERVICE BULLETIN

ISSUED MONTHLY

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ABBREVIATIONS AND SYMBOLS

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

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

NEW STATIONS

Commercial land stations, alphabetically, by names of stations

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

Station	Class	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Owner
Atlanta (Candler Field), Ga. ²	FA, FX	WQDP	278 (1,080), 3,484 (86.10), 5,900 (53.57).	P	X	S. A. T. Flying Service (Inc.).
Big Spring (Municipal Airport), Tex. ¹	FA, FX	KGUG	do	P	X	Do.
Minneapolis, Minn. ²	FX	KGPB	2,452 (122.34)	P	X	City of Minneapolis, police department.
New Orleans (Menefee Airport), La. ¹	FA, FX	WQDQ	278 (1,080), 3,484 (86.10), 5,900 (53.57).	P	X	S. A. T. Flying Service (Inc.).
Waco (Municipal Airport), Tex. ¹	FA, FX	KGUH	do	P	X	Do.
<i>Portable</i>						
Texas, Louisiana, and Oklahoma. ³	FX	KGME	1,704 (178.06)	P	X	Wireless Service Corporation.
Do. ¹	FX	KGME	do	P	X	Do.
Do. ¹	FX	KGMG	do	P	X	Do.
Do. ¹	FX	KGMH	do	P	X	Do.
Texas, Louisiana, and Oklahoma, No. 6. ³	FX	KGMI	do	P	X	Do.
Texas, Louisiana, and Oklahoma, No. 7. ³	FX	KG MJ	do	P	X	Do.
Texas, Louisiana, and Oklahoma, No. 8. ³	FX	KG MK	do	P	X	Do.
Texas, Louisiana, and Oklahoma, No. 9. ³	FX	KG ML	do	P	X	Do.
Texas, Louisiana, and Oklahoma, No. 10. ³	FX	KG MN	do	P	X	Do.
Texas, Louisiana, and Oklahoma, No. 11. ³	FX	KG MO	do	P	X	Do.

¹ Type, A1.² Type, A3.³ Type, A1, A3.

Commercial ship stations, alphabetically, by name of vessels

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

Name of vessel	Call signal	Rates, all services (cents)	Service	Hours	Owner	Message accounts settled by—
Bethlehem ¹	WC DR		PG	X	Bethlehem Transportation Corporation.	Owner.
Cambria ¹	WDDY		PG	X	do	Do.
Commercial Bostonian	KEPM	8	PG	X	Honolulu S. S. Co.	M. R. T. Co.
Cornore	WNIU		PG	X	Ora S. S. Corporation	
Daniel J. Morrell ¹	KG BD		PG	X	Cambria S. S. Co.	Owner.
Edward J. Berwind ¹	KFTY		PG	X	Franklin S. S. Corporation	Do.
Edward Y. Townsend ¹	KG BE		PG	X	Cambria S. S. Co.	Do.
Emory L. Ford ¹	KFKL		PG	X	Franklin S. S. Corporation	Do.
Fred G. Hartwell ¹	KFKJ		PG	X	do	Do.
Intercity Radio Telegraph Co.—general call for any or all vessels.	KDZZ					
Lackawanna ¹	WC DP		PG	X	Bethlehem Transportation Corporation.	Do.
Lebanon ¹	WFDS		PG	X	do	Do.
Lehigh ¹	WC DN		PG	X	do	Do.
Maryland ¹	WC DQ		PG	X	do	Do.
Pioneer S. S. Co.—general call for any or all vessels.	KFZZ				Pioneer S. S. Co.	
Saucon ¹	WQCO		PG	X	Bethlehem Transportation Corporation.	Do.
Steelton ¹	WC DS		PG	X	do	Do.

¹ Type, B; fy., 375 (800), 410 (730), 425 (705); rates, Great Lakes service, 4 cents per word. All are equipped with a radio compass.

Commercial land and ship stations, alphabetically, by call signals

Call signal	Name of station	Call signal	Name of station
KDZZ	Intercity Radio Telegraph Co.—general call for any or all vessels.....b	KGMMN	Texas, Louisiana, and Oklahoma No. 10 (portable).....fx
KEFPM	Commercial Bostonian.....b	KGMO	Texas, Louisiana, and Oklahoma No. 11 (portable).....fx
KFKJ	Fred G. Hartwell.....b	KGPB	Minneapolis, Minn.....fx
KFKL	Emory L. Ford.....b	KGUG	Big Spring (Municipal Airport), Tex.fa, fx
KFTY	Edward J. Berwind.....b	KGUH	Waco (Municipal Airport), Tex.....fa, fx
KFZZ	Pioneer S. S. Co.—general call for any or all vessels.....b	WCDN	Lehigh.....b
KGBD	Daniel J. Morrell.....b	WCDP	Lackawanna.....b
KGBE	Edward Y. Townsend.....b	WCDQ	Maryland.....b
KGME	Texas, Louisiana, and Oklahoma (portable).....fx	WQDR	Bethlehem.....b
KGMF	do.....fx	WCDS	Stelton.....b
KGMG	do.....fx	WDDY	Cambria.....b
KGMH	do.....fx	WFDS	Lebanon.....b
KGMI	Texas, Louisiana, and Oklahoma No. 6 (portable).....fx	WNIU	Cornore.....b
KGMJ	Texas, Louisiana, and Oklahoma No. 7 (portable).....fx	WQCO	Saucon.....b
KGMK	Texas, Louisiana, and Oklahoma No. 8 (portable).....fx	WQDP	Atlanta (Candler Field), Ga.....fa, fx
KGML	Texas, Louisiana, and Oklahoma No. 9 (portable).....fx	WQDQ	New Orleans (Menefee Airport), La.fa, fx
		WQDR	Rene.....b

Commercial aircraft stations, alphabetically, by names of craft

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

Station	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Owner
Bahia.....	KHEWD		P	X	New York, Rio & Buenos Aires Line (Inc.).
C-224M ¹	KHJOL	3,106 (96.58), 3,142 (95.48), 5,660 (53).	P	X	Boeing Air Transport (Inc.).
C-225M ¹	KHJPK	do.....	P	X	Do.
C-417E ¹	KHJQJ	do.....	P	X	Do.
Creole.....	KHIOX		P	X	Southern Radio Corporation, 26 Broadway, New York, N. Y.
514E.....	KHKJQ		P	X	New York, Rio & Buenos Aires Line (Inc.).
Fokker 2 ¹	KHCLO	3,070 (97.71), 3,106 (96.58), 6,350 (47.24).	P	X	Western Air Express.
Fokker 3 ¹	KHCMN	do.....	P	X	Do.
Haiti.....	KHEYB		P	X	New York, Rio & Buenos Aires Line (Inc.).
Mendoza.....	KHKCX		P	X	Do.
Montevideo.....	KHEUF		P	X	Do.
NC-306N.....	KHFUF		P	X	Pan American Airways (Inc.).
NC-309N.....	KHFVE		P	X	Do.
NC-632M.....	KHKFU		P	X	New York, Rio & Buenos Aires Line (Inc.).
NC-633M.....	KHKG T		P	X	Do.
NC-634M.....	KHKHS		P	X	Do.
NC-793K ¹	KHJRI	3,106 (96.58), 3,142 (95.48), 5,660 (53).	P	X	Boeing Air Transport (Inc.).
NC-805E ¹	KHIBY	do.....	P	X	Universal Aviation Corporation, 1051 Boatmen's Bank Building, St. Louis, Mo.
NC-945M.....	KHFWD		P	X	Pan American Airways (Inc.).
Pernambuco.....	KHEVE		P	X	New York, Rio & Buenos Aires Line (Inc.).
Porto Alegre.....	KHKAZ		P	X	Do.
Port of Spain.....	KHEZA		P	X	Do.
Rio De La Plata.....	KHKBY		P	X	Do.
Salta.....	KHKEV		P	X	Do.
Santiago.....	KHKDW		P	X	Do.
Tampa.....	KHEXC		P	X	Do.
307H.....	KHKKP		P	X	Do.
X-657M.....	KHKIR		P	X	Do.

¹ Type, A3

¹ Type, A1, A2, A3

Commercial aircraft stations, alphabetically, by call signals

Call signal	Name of station	Call signal	Name of station	Call signal	Name of station
KHCLO	Fokker 2.	KHFVE	NC-309N.	KHKBY	Rio De La Plata.
KHCMN	Fokker 3.	KHFWD	NC-945M.	KHKCX	Mendoza.
KHEUF	Montevideo.	KHIBY	NC-805E.	KHKDW	Santiago.
KHEVE	Pernambuco.	KHICK	Creole.	KHKEV	Salta.
KHEWD	Bahia.	KHJOL	C-224M.	KHKFU	NC-632M.
KHEXC	Tampa.	KHJPK	C-225M.	KHKGT	NC-633M.
KHEYB	Haiti.	KHIQJ	C-417E.	KHKHS	NC-634M.
KHEZA	Port of Spain.	KHJRI	NC-793K.	KHKIR	X-657M.
KHFUF	NC-306N.	KHKAZ	Porto Alegre.	KHKJQ	514E.
				KHKKP	307H.

Broadcasting stations, alphabetically, by names of States and cities

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

State and city	Call signal	Frequency in kilocycles, meters in parentheses	Power (watts)
New York:			
Long Beach ¹	WCLB	1,500 (200).....	100
Orchard Park (studio at Buffalo, N. Y.).....	WRDA	900 (333).....	1,000
Oklahoma: Elk City.....	KGMP	1,210 (247.9).....	100
South Carolina:			
Charleston.....	WCSC	1,310 (229).....	100 250
Spartanburg.....	WSPA	1,420 (211.3).....	100 250
Vermont: St. Albans.....	WQDM	1,370 (219).....	5

¹ Relicensed.² Day.³ Night.

Broadcasting stations, alphabetically, by call signals

Call signal	Location of transmitter (mail address)	Owner	Frequency in kilocycles, meters in parentheses	Power (watts)
KGMP	Elk City, Okla., Story Hotel	Bryant Radio & Electric Co.	1,210 (247.9).....	100
WCLB	Long Beach, N. Y., Franklin Hotel.	Arthur Faske.....	1,500 (200).....	100
WCSC	Charleston, S. C.....	Fred Jordan & Lewis Burk..	1,310 (229).....	100 250
WQDM	St. Albans, Vt., 16 Kingman St.	A. J. St. Antoine.....	1,370 (219).....	5
WRDA	Orchard Park, N. Y. (studio at Buffalo, N. Y.)	Buffalo Evening News.....	900 (333).....	1,000
WSPA	Spartanburg, S. C., Montgomery Building.	The Voice of South Carolina (Virgil V. Evans).	1,420 (211.3).....	100 250

¹ Day.² Night.

Government land stations, alphabetically, by name of station

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

Station	Class	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Owner
Fort De Lesseps, Canal Zone. ¹	FC, FX	WLZ	711 (420), 750 (400), 826 (365).	O	X	U. S. Army.
Tulsa, Okla. ²	FX	KCAA	296 (1,005).....	Fs, FX	X	Department of Commerce, Bureau of Lighthouses.

¹ Loc. 79° 34' 39" E., 09° 21' 55" N.; type, A1, A2, A3; power, height of aerial, and intensity of current at base, 60 feet, 1.3 amperes.² Type, A3.

Government land and ship stations, alphabetically, by call signals

Call signal	Name of station	Call signal	Name of station
KCAA	Tulsa, Okla. fa, fx	WLZ	Fort De Lesseps, Canal Zone. fc, fx

Experimental stations, alphabetically, by names of stations

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

Station	Call signal	Frequency in kilocycles, meters in parentheses	Power (watts)	Owner
California: Los Angeles.	W6XAN	23,100 (12.987), 24,100 (12.448), 28,100 (11.494), 31,000 (9.68), 37,000 (8.11), 45,000 (6.667), 55,000 (5.455), 65,000 (4.615).	1,060	Press Wireless (Inc.), 666 Lake Shore Drive, Chicago, Ill.
Illinois: Chicago.....	W9XP	do.	1,000	Do.
Florida: Miami.....	W4XA	30,100 (9.97), 40,100 (7.481), 50,100 (5.988).	100	Pan American Airways (Inc.).
New Jersey: Newark (airport).	W2XY	1,608 (186.57), 2,326 (128.97), 3,088 (97.15), 4,785 (62.69), 6,335 (47.35).	400	Colonial Air Transport (Inc.), 270 Madison Ave., New York, N. Y.
Weehawken.....	W2XBK	60,100 (4.99).....	10	R. C. A. Communications (Inc.).
New York: Little Neck.	W2XCK	23,100 (12.987), 24,100 (12.448), 28,100 (11.494), 31,000 (9.68), 37,000 (8.11), 45,000 (6.667), 55,000 (5.455), 65,000 (4.615).	1,000	Press Wireless (Inc.).
<i>Vessels</i>				
Portable (operates on board vessels).	W10XK	6,635 (45.21), 8,200 (36.59), 8,900 (33.71), 11,230 (26.71).	500	Bell Telephone Laboratories (Inc.), 463 West St., New York, N. Y.
Utica.....	W2XAT	50,000 (6) 60,000 (5), 80,000 (3.75), 100,000 (3), 300,000 (1).	10	R. C. A. Communications (Inc.).

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

Call signal	District and station	Call signal	District and station
W2XAT W2XBK W2XCK W2XY W4XA	Second district: Utica (vessel). Weehawken, N. J. Little Neck, N. Y. Newark, N. J. (airport). Fourth district: Miami, Fla.	W6XAN W9XP W10XK	Sixth district: Los Angeles, Calif. Ninth district: Chicago, Ill. <i>Aircraft, portable and vessels</i> Portable (operates on board vessels).

ALTERATIONS AND CORRECTIONS

COMMERCIAL LAND STATIONS

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

ALBUQUERQUE, N. MEX. (KSI).—Fy., 235 (1,275), 278 (1,080), 333 (900), 414 (725); hours, X.

CEIBA, P. R., Radio.—Fy., 438 (685), 500 (600), 1,592 (188.44), 5,525 (54), 6,515 (46.05); service, PG.

CLEVELAND, OHIO (WRGH).—Fy., 2,452 (122.34).

CLOVIS, N. MEX.—Fy., 235 (1,275), 278 (1,080), 333 (900), 420 (715); hours, X.

COLUMBUS, OHIO (WHG).—Fy., 235 (1,275), 278 (1,080), 333 (900), 393 (765); hours, X.

- DALLAS, TEX. (Love Field-KGUF).—Type, A1; fy., 278 (1,080), 3,484 (86.10), 5,660 (53); hours, X.
- DEAL, N. J., Radio.—Loc., changed to Ocean Gate, N. J., Radio; fy., add 12,915 (23.23) 17,130 (17.513); hours, N.
- FRAMINGHAM, MASS. (WMP).—Owner, Commonwealth of Massachusetts, department of public safety.
- HOQUIAM, WASH., Radio.—Hours, N; owner, Olympic Radio Co.
- INDIANAPOLIS, IND. (WHM).—Fy., 235 (1,275), 278 (1,080), 333 (900), 400 (750); hours, X.
- INDIANAPOLIS, IND. (WMDZ).—Owner, city of Indianapolis police department.
- KINGMAN, ARIZ. (KSX).—Fy., 235 (1,275), 278 (1,080), 333 (900), 457 (655).
- LANAI, HAWAII.—Fy., 500 (600), 4,212 (71.22), 5,720 (52.447).
- MARION, MASS., Radio (WCC).—Fy., add 111 (2,705), 125 (2,400), 137 (2,190).
- MIAMI, FLA. (WKDL).—Fy., 278 (1,080), 333 (900), 414 (725), 500 (600), 2,662 (112.69), 3,070 (97.71), 5,690 (52.72), 12,210 (24.57).
- NEEDHAM, MASS.—Fy., 7,370 (40.71), 7,835 (38.29), 15,670 (19.145), 15,880 (18.892).
- NEWTON, MASS.—Loc., changed to Needham, Mass.; loc., 71° 13' 45'' W., 42° 16' 40'' N.; fy., add 7,835 (38.29), 15,760 (19.036); hours, X.
- NEW YORK, N. Y., Radio (WHD).—Hours, N.
- NEW YORK, N. Y., Radio (WPN).—Loc., changed to Garden City, N. Y., Radio; type, A1-2-3; fy., 4,116 (72.886), 5,525 (54.3), 6,515 (46.05), 8,630 (34.76), 11,050 (27.15), 11,200 (26.79), 16,580 (18.094), 16,900 (17.751), 22,100 (13.575), 22,160 (13.538).
- SAN JUAN, P. R. (WGZ).—Loc., 66° 06' 50'' W., 18° 27' 55'' N.
- SAN JUAN, P. R. (WJT).—Loc., 66° 06' 50'' W., 18° 27' 55'' N.; fy., 4,276 (70.15).
- SAN JUAN (Pan American Airport), P. R. (WMDU).—Fy., 278 (1,080), 2,662 (112.69), 3,070 (97.71), 5,690 (52.72), 12,210 (24.57).
- SAYVILLE, N. Y., Radio.—Fy., add 392 (765), 500 (600).
- SEATTLE, WASH. (KGPA).—Owner, city of Seattle fire and police departments.
- SELIGMAN, ARIZ.—Loc., changed to Flagstaff, Ariz.
- TUCKERTON, N. J., Radio (WSC).—Fy., add 111 (2,705), 125 (2,400), 137 (2,190).
- TULARE, CALIF.—Fy., 2,416 (124.17).
- VIEQUES, P. R., Radio.—Fy., 438 (685), 500 (600), 1,592 (188.44), 5,525 (54), 6,515 (46.05); service, PG.
- WAYNOKA, OKLA.—Fy., 235 (1,275), 278 (1,080), 333 (900), 393 (765); hours, X.
- WINSLOW, ARIZ.—Fy., 235 (1,275), 278 (1,080), 333 (900), 400 (750).

Portable

- TEXAS, LOUISIANA, AND OKLAHOMA.—Fy., 1,600 (187.5), 1,652 (181.6), 1,664 (180.29), 1,680 (178.6), 1,704 (176.06).

COMMERCIAL SHIP STATIONS, ALPHABETICALLY, BY NAMES OF VESSELS

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

- A. A. AUGUSTUS.—Accounts, owner.
- A. D. MACBETH.—Accounts, owner.
- AGWISTONE.—Name changed to Beacon; owner, Beacon Oil Co. (Inc.).
- ALDER (KDTI).—Name changed to Consec; owner, John W. Hubbard.
- ALDER (WPBY).—Owner, William Boyce Thompson.
- AMAZON.—Accounts, owner.
- ARMINDA.—Accounts, owner.
- BALLENAS.—Accounts, owner.
- BARRYTON.—Accounts, owner.
- BRISTOL.—Name changed to William H. Machen.
- CHARLES NELSON.—Owner, Charles Nelson Co.
- CHIPPEWA.—Accounts, owner.
- CLETUS SCHNEIDER.—Owner, Schnedider S. S. Co.
- COMMERCIAL SPIRIT.—Name changed to Charles Nelson.
- COMMERCIAL TRAVELER.—Name changed to Nelson Traveler.
- COMUS.—Name changed to Western Ocean; owner, North American Fruit & S. S. Corporation.
- CORVUS.—Name changed to Flomar; owner, Calmar S. S. Corporation.
- DARDEN.—Name changed to Elizabeth Kellogg.

- EASTERN CROWN.—Owner, Eastern Crown S. S. Co (Inc.).
 F. A. BAILEY.—Accounts, owner.
 FONTANA.—Accounts, owner.
 FRANK BILLINGS.—Accounts, owner.
 FRANK SEITHER.—Accounts, owner.
 FREEPORT SULPHUR No. 6.—Name changed to Thermo; owner, Thermo S. S. Co.
 GADFLY II.—Fy., 143 (2100), 151 (1985), 375 (800), 410 (730), 425 (705), 500 (600), 5525 (54.3), 5555 (54), 8290 (36.19), 11050 (27.15), 11230 (26.71).
 G. A. TOMLINSON.—Accounts, owner.
 GLENDOYLE.—Owner, Hammond Lumber Co. (Inc.).
 GOODTIME.—Accounts, owner.
 GRAND ISLAND.—Accounts, owner.
 HUGUENOT.—Owner, American Trust Co. (Inc.).
 HULVER.—Owner, Tennessee Coal, Iron & Railroad Co.
 ISOBEL WEEMS.—Owner, Baltimore & Carolina S. S. Co.
 JOSEPH D. WOOD.—Name changed to Henry W. Card; owner, Virginia Towing Corporation.
 LAKE GALEWOOD.—Owner, Robert C. Sudden.
 L. E. BLOCK.—Accounts, owner.
 MALOLO LIFEBOAT (KIIA).—Name changed to Malolo Lifeboat No. 1.
 MALOLO LIFEBOAT (KIIB).—Name changed to Malolo Lifeboat No. 2.
 MARIPOSA.—Accounts, owner.
 MARITANA.—Accounts, owner.
 MUNBEAVER.—Owner, Munson S. S. Line (Inc.).
 OLIVE K.—Fy., 11050 (27.15).
 ORAN.—Name changed to San Anselmo.
 POINT BONITA.—Accounts, R. M. C. A.
 POINT GORDA.—Accounts, R. M. C. A.
 POINT REYES.—Accounts, R. M. C. A.
 QUEEN.—Correct call W G C R (U. S. L.).
 RAJAH.—Owner, Munson S. S. Line (Inc.).
 REME.—Name changed to Pegasus; owner, Clifford Hemphill.
 ROBERT J. PAISLEY.—Owner, Schneider S. S. Co.
 ROMULUS.—Owner, Spencer Kellogg & Sons (Inc.).
 SANTA ANA.—Owner, Orange Belt S. S. Co.
 SWIFSTARROW.—Owner, Boat Owning & Operating Co. (Inc.).
 SWIFTEAGLE.—Owner, Boat Owning & Operating Co. (Inc.).
 SWIFTLIGHT.—Owner, Boat Owning & Operating Co. (Inc.).
 SWIFTSURE.—Owner, Boat Owning & Operating Co. (Inc.).
 SWIFTWIND.—Owner, Boat Owning & Operating Co. (Inc.).
 WESTERN ALLY.—Name changed to Forbes Hauptman; owner, Chas. R. McCormick Lumber Co. (Inc.).
 WEST MONTOP.—Name changed to San Rafael.
 WILLANGLO.—Name changed to San Angelo.
 Strike out all particulars of the following-named vessels: Centurion, Charlton Hall, Frieda, Heigh-Ho, Iolanthe, Lake Faulk, Manistique, Nipsic, Oceania, Oneida (KEZJ), Skagway, Suremico, Trader, Winchester.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY, BY CALL SIGNALS

KDDA, read Nelson Traveler; KDEQ, read Charles Nelson; KDTI, read Consec; KDPO, read Beacon; KEGC, read William H. Machen; KEJF, read Forbes Hauptman; KFIH, read Henry W. Card; KGSL, read Flagstaff, Ariz.; KIIA, read Malolo Lifeboat No. 1; KIIB, read Malolo Lifeboat No. 2; KOPL, read Flomar; KOTR, read San Rafael; KUDG, read San Anselmo; KUNP, read Thermo; KUPK, read Elizabeth Kellogg; WDIO, read San Angelo; WICA, read Western Ocean; WJK, read Needham, Mass.; WKDZ, read Pegasus; WOO, read Ocean Gate, N. J., Radio; WPN, read Garden City, N. Y., Radio; strike out all particulars following the call signals: KDHB, KDJJ, KDYZ, KEJP, KEZJ, KFEA, KFRS, KFYC, KGGL, WDCV, WHDB, WPBX, WPCQ, WQCT.

COMMERCIAL AIRCRAFT STATIONS, ALPHABETICALLY, BY NAMES OF CRAFT

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

The call signals of the following-named aircraft will be changed effective April 1, 1930, as shown hereunder:

Name	Present call	New call	Name	Present call	New call
Buenos Aires.....	KHEK	KHEKP	NC-196H	KHGA	KHGAZ
C-268	KHAF	KHAFU	NC-231E	KHAU	KHAUF
C-269	KHBA	KHBAZ	NC-300N	KHFR	KHFRI
C-270	KHBB	KHBBY	NC-304N	KHFS	KHFSH
C-272	KHBC	KHBCX	NC-395E	KHAW	KHAWD
C-273	KHBD	KHBDW	NC-396E	KHAX	KHAXC
C-274	KHBE	KHBEV	NC-454E	KHAE	KHAEV
C-276	KHBG	KHBGT	NC-890E	KHEM	KHEMN
C-277	KHBB	KHBBH	NC-810H	KHFD	KHFDW
C-279	KHBJ	KHBJQ	NC-811H	KHFF	KHFFU
C-281	KHBK	KHBJK	NC-812H	KHFF	KHFFH
C-283	KHBM	KHBMN	NC-813H	KHFF	KHFFQ
C-284	KHBN	KHBNM	NC-814H	KHFI	KHFIR
C-285	KHBO	KHBOI	NC-1612	KHAC	KHACX
C-286	KHBP	KHBPB	NC-3314	KHFB	KHFBY
C-287	KHBQ	KHBQI	NC-5192	KHFC	KHFCX
C-288	KHBR	KHBRI	NC-7770	KHAY	KHAYB
C-290	KHBT	KHBTG	NC-8000	KHAK	KHAKP
C-291	KHBU	KHBUF	NC-8020	KHAV	KHAVE
C-292	KHBV	KHBVE	NC-8022	KHGB	KHGBY
City of Albuquerque	KHDC	KHDCX	NC-8031	KHHA	KHHAY
City of Columbus	KHDH	KHDHS	NC-8043	KHBB	KHBBY
City of Glendale	KHEF	KHEFU	NC-8044	KHAP	KHAPK
City of Indianapolis	KHDG	KHDGT	NC-9107	KHAS	KHASH
City of Los Angeles	KHDF	KHDFU	NC-9137	KHFA	KHFAZ
City of Philadelphia	KHDK	KHDKP	NC-9151	KHAT	KHATG
City of St. Louis	KHDJ	KHDJQ	NC-9157	KHEC	KHECX
City of Washington	KHDD	KHDDW	NC-9637	KHAQ	KHAQJ
City of Wichita	KHDE	KHDEV	NC-9652	KHDL	KHDLO
Cuba	KHES	KHESH	NC-9653	KHDM	KHDMN
F-1	KHAJ	KHAJQ	NC-9654	KHDN	KHDNM
F-2	KHAG	KHAGT	NC-9655	KHDO	KHDOL
F-3	KHAI	KHAIR	NC-9656	KHDP	KHDPK
F-4	KHCA	KHCAZ	NC-9657	KHDQ	KHDQJ
F-5	KHCB	KHCBY	NC-9658	KHDR	KHDRJ
F-6	KHCC	KHCCX	NC-9659	KHDS	KHDSH
F-7	KHCD	KHCDW	NC-9660	KHDT	KHDTG
F-8	KHCE	KHCEV	NC-9664	KHAD	KHADW
F-9	KHCF	KHCFU	NC-9670	KHFT	KHFTG
F-10	KHCG	KHCGT	NC-9685	KHAH	KHAHS
F-11	KHCH	KHCHS	NC-9688	KHFL	KHFLO
F-12	KHOI	KHOIR	NC-9701	KHAO	KHAOL
F-14	KHOJ	KHOJQ	NC-9703	KHAR	KHARI
F-15	KHCK	KHCKP	NC-9775	KHAA	KHAAZ
Havana	KHER	KHERI	NC-9776	KHAB	KHABY
NC-75K	KHFK	KHFKP	NC-9779	KHRC	KHRCX
NC-100K	KHEP	KHEPK	Rio de Janeiro	KHEO	KHEOL
NC-132H	KHGC	KHGCX	San Juan	KHET	KHETG
NC-133H	KHGD	KHGDW	The City of New York	KHDA	KHDAZ
NC-142M	KHFN	KHFNM	The Kansas City	KHDB	KHDBY
NC-144M	KHFO	KHFOL	Washington	KHED	KHEDW
NC-145M	KHFP	KHFPK	X-118E	KHEI	KHEIR
NC-146M	KHFQ	KHFQJ	X-855E	KHEH	KHEHS
NC-147H	KHFE	KHFEV			

C-4458.—Name changed to F-1.

C-5170.—Name changed to F-2.

C-5358.—Name changed to F-3.

Cuba.—Type, A1 and 2; fy., 333 (900), 375 (800), 414 (725), 457 (655), 500 (600), 3070 (97.7), 3106 (96.58), 5525 (54.3), 5690 (52.72), 8290 (36.19), 11050 (27.15); service, PG; hours, N; rates, 8 cents per word.

NC-144M.—Type, A1-2-3; fy., 333 (900), 414 (725), 500 (600), 2662 (112.69), 3070 (97.71), 3106 (96.58), 5690 (52.72); service, P; hours, X.

NC-145M.—Type, A1-2-3; fy., 333 (900), 414 (725), 500 (600), 2662 (112.69), 3070 (97.71), 3106 (96.58), 5690 (52.72); service, P; hours, X.

NC-146M.—Type, A1-2-3; fy., 333 (900), 414 (725), 500 (600), 2662 (112.69), 3070 (97.71), 3106 (96.58), 5690 (52.72); service, P; hours, X.

NC-182H.—Type, A1 and A3; fy., 3106 (96.58); service, P; hours, X.

NC-300N.—Type, A1-2-3; fy., 333 (900), 414 (725), 500 (600), 2662 (112.69); 3070 (97.71), 3106 (96.58), 5690 (52.72); service, P; hours, X.
 NC-304N.—Type, A1-2-3; fy., 333 (900), 414 (725), 500 (600), 2662 (112.69); 3070 (97.71), 3106 (96.58), 5690 (52.72); service, P; hours, X.
 Strike out all particulars of the following-named stations: El Alma De Las Americas, Liberty, Standard of California, Sunbeam.

COMMERCIAL AIRCRAFT STATIONS, ALPHABETICALLY, BY CALL SIGNALS

KHAG, read F-2; KHAI, read F-3; KHAJ, read F-1; strike out all particulars following the call signals KHAL, KHAZ, KHEN, KHEQ.

BROADCASTING STATIONS, BY CALL SIGNALS

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

KFDM (Beaumont, Tex.).—Power, 500 night, 1,000 day.
 KFXX (Oklahoma City, Okla.).—Power, 100 night, 250 day.
 KGBX (St. Joseph, Mo.).—Fy., 1,310 (229).
 KGHF (Pueblo, Colo.).—Power, 250 night, 500 day.
 KGIW (Trinidad, Colo.).—Owner, Leonard E. Wilson.
 KGRC (San Antonio, Tex.).—Call changed to KONO.
 KIT (Yakima, Wash.).—Fy., 1,310 (229).
 KJR (Seattle, Wash.).—Fy., 970 (309).
 KOB (State College, N. Mex.).—Power, 20,000.
 KOOS (Marshfield, Oreg.).—Power, 100.
 KPCB (Seattle, Wash.).—Power, 100.
 KPQ (Seattle, Wash.).—Loc., changed to Wenatchee, Wash., power, 50.
 KTLC (Richmond, Tex.).—Loc., changed to Houston, Tex.; power, 100.
 KVI (Des Moines, Wash., near).—Fy., 920 (326).
 KWJJ (Portland, Oreg.).—Owner, KWJJ Broadcast Co. (Inc.).
 WBAX (Wilkes-Barre, Pa.).—Loc., changed to Plains Township, Pa.
 WBMS (Fort Lee, N. J.).—Loc., changed to Hackensack, N. J.
 WCAE (Pittsburgh, Pa.).—Power, 500 normally, 1,000 experimentally.
 WCBM (Baltimore, Md.).—Power, 100 night, 250 day.
 WCGU (Coney Island, N. Y.).—Loc., changed to Brooklyn, N. Y.
 WGAL (Lancaster, Pa.).—Owner, WGAL (Inc.).
 WGES (Chicago, Ill.).—Power, 500 normally, 1,000 daytime, only on Sundays.
 WGTB (Columbia, S. C.).—Call changed to WIS.
 WHEC (Rochester, N. Y.).—Owner, Hickson Electric & Radio Corporation.
 WJAY (Cleveland, Ohio).—Fy., 610 (492).
 WJAZ (Mt. Prospect, Ill.).—Power, 2,500.
 WJBO (New Orleans, La.).—Fy., 1,420 (211.3).
 WKRC (Cincinnati, Ohio).—Owner, WKRC (Inc.).
 WLBL (Stevens Point, Wis.).—Owner, State of Wisconsin Department of Agriculture and Markets.
 WLBW (Oil City, Pa.).—Power, 500 night, 1,000 day.
 WMES (Boston, Mass.).—Owner, Boston Broadcasting Co.
 WQBC (Utica, Miss.).—Loc., changed to Vicksburg, Miss.; owner, Delta Broadcasting Co. (W. B. Ford and E. M. Pace).
 WRBJ (Hattiesburg, Miss.).—Fy., 1,370 (219).
 WSB (Atlanta, Ga.).—Power, 5,000.
 WSOA (Deerfield, Ill.).—Call changed to WCHI.
 WSSH (Boston, Mass.).—Fy., 1,360 (220.9); power, 500.
 WTFI (Toccoa, Ga.).—Power, 500.
 Strike out all particulars of the following-named station: WFBJ (Collegetown, Minn.).

GOVERNMENT LAND STATIONS, ALPHABETICALLY, BY NAMES OF STATIONS

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

CAPE MALA, CANAL ZONE, RADIO.—Call changed to NGR.
 COLON, PANAMA, RADIO.—Read Colon, Canal Zone, Radio.
 LA PALMA, PANAMA, RADIO.—Call changed to NCW.
 ST. CROIX, VIRGIN ISLANDS.—Call changed to NBR.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY, BY NAMES OF STATIONS

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

Strike out all particulars of the following-named vessels: Birmingham, Topeka, York.

RADIO-COMPASS STATIONS

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

DESTRUCTION ISLAND, WASH.—Call changed to NBG.
POINT HUENEME, CALIF.—Call changed to NCA.

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

NAX, read Colon, Canal Zone, Radio; NMD, call changed to NCA; NNI, call changed to NBR; NNT, call changed to NGR; NNW, call changed to NCW; NOJ, call changed to NBG; strike out all particulars following the call signals NAFM, NENF, NIQQ.

EXPERIMENTAL 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, 1929]

MARYLAND: Baltimore (W3XA).—Strike out all particulars.

NEW YORK:

Mitchel Field (W2XBG).—Strike out all particulars.

New York (W2XAP).—Strike out all particulars.

New York (W2XR).—Loc., changed to Long Island City, N. Y.

PORTABLE:

CALIFORNIA—

San Diego (W6XJ).—Strike out all particulars.

San Francisco (W6XBB).—Fy., add 4795 (62.57).

NEW JERSEY—Livingston (W2XAN).—Loc., changed to Jones Beach, N. Y. (near).

Truck No. 1 (W10XM).—Fy., add 8650 (34.68), 12850 (23.35), 23120 (12.97)

Truck No. 2 (W10XX).—Fy., add 8650 (34.68), 12850 (23.35), 23120 (12.97)

Truck No. 3 (W10XY).—Fy., add 8650 (34.68), 12850 (23.35), 23120 (12.97)

RELAY BROADCASTING STATIONS, BY NAME OF STATIONS

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

PENNSYLVANIA: Philadelphia (near Bustleton) (W3XAU).—Loc., changed to Philadelphia, Pa. (near Byberry).

VISUAL BROADCASTING STATIONS, BY NAME OF STATIONS

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

ILLINOIS: Addison (W9XAP).—Loc., changed to Chicago, Ill.

NEW YORK: New York (W2XR).—Loc., changed to Long Island City, N. Y.

MISCELLANEOUS

GENERAL ORDER OF THE FEDERAL RADIO COMMISSION

Alaskan station licenses extended until January 25, 1931 (General Order No. 83, January 25, 1930).

It is ordered, That all existing licenses and special authorizations covering the operation of coastal and point-to-point transmitting stations located in the Territory of Alaska, heretofore extended by the Federal Radio Commission's General Orders, Nos. 72, 73, and 80, are hereby extended to and will expire on January 25, 1931.

Provided, however, That this order shall not be deemed or construed as a finding or decision by the commission or as any evidence whatsoever that the continued use or operation of any such station after January 25, 1931, serves or will serve public interest, convenience, or necessity, or that public interest, convenience, or necessity will be served by the granting of any application for license or renewal of license, and the holder of any license or special authorization subject to this order who continues to use or operate any station during the period covered by this order shall be deemed to have consented to such conditions.

It is further ordered, That with regard to stations affected by this order no construction permit, license, or renewal or modification of license shall be granted unless subsequent to the issuance hereof, an application therefor has been made pursuant to the radio act of 1927 and in accordance with the provisions of General Order No. 79 of the commission.

INTERNATIONAL ICE-PATROL SERVICE

The Coast Guard cutters *Modoc* and *Mojave* have been detailed for the season of 1930 to carry on the international ice-observation and ice-patrol service provided for by the International Convention for the Safety of Life at Sea at London in 1913 and 1914.

The object of the ice-patrol service is to locate the icebergs and field ice nearest to the trans-Atlantic steamship lane. It will be the duty of the patrol vessels to determine the southerly, easterly, and westerly limits of the ice and to keep in touch with these fields as they move to the southward in order that radio messages may be sent out daily, giving the whereabouts of the ice, particularly the ice that may be in the immediate vicinity of the regular trans-Atlantic steamship lanes.

During the months of March, April, May, and June, and as much longer as necessary, these two vessels will base on Halifax, Nova Scotia. The patrol will be continuous, and the vessel on patrol will not leave her station until relieved by the other vessel unless it is absolutely necessary to do so.

Having located the ice, the vessel on patrol will transmit four daily radio broadcasts, giving ice information for the benefit of shipping, each broadcast being repeated two times with an interval of 2 minutes. Each broadcast will be preceded by the general call CQ on 500 kilocycles (600 meters) from the vessel on patrol (NIDK) immediately followed by the ice broadcast on the frequency specified as follows:

G. C. T.			G. C. T.		
Time		Frequency in kilocycles (meters in parentheses)	Time		Frequency in kilocycles (meters in parentheses)
Seventy-fifth meridian			Seventy-fifth meridian		
0000.....	1900	175 (1,715).	1200.....	0700	175 (1,715).
1100.....	0600	425 (705).	2300.....	1800	425 (705).

The radio procedure will be in accordance with the provisions of the International Radiotelegraph Convention of Washington, 1927, which went into effect January 1, 1929.

Ice information will be given by radio at any time to any ship with which the patrol vessel can communicate. Such information will be furnished as regular radio traffic (without charge) on commercial traffic frequencies.

Ice information broadcasts will be given in as plain, concise English as practicable and will state in the following order: (a) Position of patrol vessel, (b) location and description of ice, (c) other data.

The ice-patrol vessels' general radio call letters are NIDK. This is a special call for the vessel actually on patrol and should not be confused with the regular radio call letters assigned to the individual vessels.

The radio messages from the ice-patrol vessel and from other sources will be given publicity by the Hydrographic Office, as follows:

	Call signal	Time		Frequency in kilocycles (meters in parentheses)	Type of wave
		Seventy-fifth meridian standard			
Washington,	NAA	1700	1200	113 (2,655)	ACW.
		0200	2100	113 (2,655)	ACW.
Boston, Mas	NAD	1600	1100	102 (2,940)	CW.
		2200	1700	102 (2,940)	CW.
New York, I	NAH	1530	1030	102 (2,940)	CW.
		2130	1630	102 (2,940)	CW.
Norfolk, Va.	NAM		0400	122 (2,460)	CW.
			1100	122 (2,460)	CW.

Ice data follows the Hydrographic Bulletin.

APPLICATIONS FOR LAND STATION LICENSES MUST SHOW THE EXACT GEOGRAPHICAL LOCATION

As the Radio Division has received a number of applications for general public, point-to-point, and broadcasting stations, wherein the exact location in degrees, minutes, and seconds have been incorrectly cited, the attention of applicants and others concerned is invited to article 13 of the General Regulations, International Radiotelegraph Convention, Washington, 1927, which requires that the "exact geographical position of the transmitting antenna, indicated by territorial subdivision and by the longitude and latitude in degrees, minutes, and seconds, longitude being calculated with respect to the meridian of Greenwich," be furnished to the International Bureau of the Telegraph Union for promulgation in the lists of stations issued by that bureau. This information is also necessary for the records of this administration and for publication in the list of Commercial and Government Radio Stations of the United States.

REGULATION REGARDING THE USE OF 500 KILOCYCLES (600 METERS) FOR TRAFFIC OTHER THAN CALLING AND DISTRESS

Recently the Radio Division has received a few complaints regarding interference caused by radio operators transmitting traffic on this frequency. Article 17, paragraph 4, of the General Regulations, International Radiotelegraph Convention, requires that "the wave of 500 kilocycles (600 meters) shall be the international calling and distress wave. It may be used, but with *discretion*, for other purposes, if it does not interfere with distress, urgent, safety, or call signals." As interference may be caused at times, unknowingly, by transmitting traffic on this frequency, operators are cautioned to use some other frequency for traffic other than that specified above.

Sections 5 and 32 of the radio act of 1927 provide that any person violating a regulation of the International Radiotelegraph Convention may have his license suspended or fined, respectively.

MASTERS OF VESSELS AND RADIO OPERATORS CAUTIONED TO FOLLOW THE REQUIREMENTS OF ARTICLE 19, INTERNATIONAL CONVENTION

Particular attention is invited to paragraph 22 of this article which provides that the "urgent signal" (XXX) must be used in sending messages relative to the safety of a person on board ship. This provision is to be construed as pertaining to medical advice. To use the distress (S O S) signal and traffic thereto as provided in paragraphs 1 to 20 of this same article in lieu of the "urgent signal" would constitute a violation of section d, article 5, of the convention proper, which provides that countries adhering to the convention agree to prevent the transmission or the placing in circulation of false or deceptive distress signals or distress calls.

REVISED AMATEUR STATION REGULATIONS

[Revised January 18, 1930]

Information relative to amateur radio licenses should be secured and applications for station and operator's licenses should be filed through the district supervisors of radio of the Department of Commerce.

An amateur station is a station operated by a person interested in radio technique solely with a personal aim and without pecuniary interest. Amateur licenses will not be issued to stations of other classes.

Amateur radio stations are authorized for communication only with similarly licensed stations, except as indicated below, and on wave lengths or frequencies within the following bands:

Kilocycles	Meters	Kilocycles	Meters
1,715-2,000	175.0-150.0	28,000-30,000	10.71-30.0
3,500-4,000	85.7-75.0	56,000-60,000	5.36-5.0
7,000-7,300	42.86-41.1	400,000-401,000	0.75-0.748
14,000-14,400	21.43-20.83		

and at all times unless interference is caused with other radio services, in which event a silent period must be observed between the hours of 8 and 10.30 p. m., local time, and on Sundays during local church services.

Amateur radiotelephone apparatus will be licensed for operation only in the following bands:

Kilocycles	Meters	Kilocycles	Meters
1,715-2,000	175.0-150.0	14,100-14,300	21.23-20.98
3,500-3,560	85.70-84.50	56,000-60,000	5.36-5.0

Provided, however, That operation in the band of 14,100 to 14,300 kilocycles will be permitted only by operators holding extra first-class operator's licenses or, lacking such licenses, by operators who in their applications for station licenses show special technical qualification and ability to operate within the limits prescribed herein.

Amateur television and operation of picture-transmission apparatus will be permitted only in the following bands:

Kilocycles	Meters
1,715-2,000	175.0-150.0
56,000-60,000	5.36-5.0

Spark transmitters will not be authorized for amateur use.

Amateur stations must use circuits loosely coupled to the radiating system or devices that will produce equivalent effects to minimize key impacts, harmonics, and plate supply modulations. Conductive coupling, even though loose, will not be permitted, but this restriction shall not apply against the employment of transmission-line feeder systems to Hertzian antennae.

The frequency of the waves emitted must be as constant and as free from harmonics as the state of the art permits.

The station operator must announce call letters and location as frequently as may be practicable when station is in operation, and in any event not less than once during each 15 minutes of transmission. This requirement is waived when such announcement would interrupt a single consecutive message, and in such cases the announcement of the call letters and location shall be made at the beginning and end of such message.

Amateur stations are not permitted to communicate with commercial or Government stations unless authorized by the licensing authority except in an emergency or for testing purposes. This restriction does not apply to communica-

tion with small pleasure craft such as yachts and motor boats holding limited commercial station licenses which may have difficulty in establishing communication with commercial or Government stations.

Amateur stations are not authorized to broadcast news, music, lectures, sermons, or any form of entertainment, or to conduct any form of commercial correspondence.

No person shall operate an amateur station except under and in accordance with an operator's license issued to him by the Secretary of Commerce.

ICELAND AND YUGOSLAVIA RATIFY THE INTERNATIONAL CONVENTION

These countries deposited have their ratifications of the International Radio Convention, Washington, 1927, with the Department of State.

PROCEDURE OF SAYVILLE, N. Y., RADIO FOR TRANSMITTING TRAFFIC LISTS

This station, call signal WSL, will broadcast traffic lists for ships for which it has traffic to transmit as follows: 500 kc/s. (600 m.) and 120 kc/s. (2,500 m.) every 3 hours, beginning at 0050 and 0350 G. M. T., and every 3 hours thereafter.

Individual calls for ships for which it may have traffic will be as made as follows: 13,060 kc/s. (22.97 m.), 1,300 to 2,100 G. M. T. (day frequency); 8,670 kc/s. (34.60 m.), 2,100 to 1,300 G. M. T. (night frequency); 500 kc/s. (600 m.) and 120 kc/s. (2,500 m.), at other times when traffic warrants.

TRANSMITTING FREQUENCIES OF CULLERCOATS (GREAT BRITAIN) RADIO

This station is now equipped for transmitting on the following frequencies: 500 (600 m.) calling, 410 (731.7 m.) and 1,364 (220 m.) working.

RADIOBEACON ESTABLISHED AT NORTH FORELAND, ENGLAND

An experimental radiobeacon has been established at the lighthouse located in latitude 51° 22' N., longitude 1° 27' E. (approximately) to test its suitability for a permanent installation. It operates on a frequency of 300 (1,000 m.).

During thick weather, whenever the atmosphere in the vicinity of the lighthouse is obscured so as to impede navigation the beacon transmits continuously for 1 minute, every 4 minutes, as follows: (a) The Morse letters MMF (— — — . . — .) will be emitted continuously at the rate of 15 words per minute, for 48 seconds, approximately; (b) a continuous dash (————) for 10 seconds, approximately; (c) the Morse letters MMF made once, of 2 seconds, approximately (the whole transmission of a, b, and c occupies 1 minute); (d) a silent period of 3 minutes. During clear weather, in order to afford facilities for obtaining bearings, three emissions of the complete signal described above, will be made consecutively at half-hourly intervals (approximately) commencing at 19 minutes past the hour.

Masters of vessels equipped with a radio compass intercepting these signals are particularly requested to forward reports as to its general effectiveness and correctness of its character and bearings to the secretary, Trinity House, London, England. Reports should give the date, time, geographical bearing of, and distance from, the beacon at which each observation was made.

FURTHER INFORMATION REGARDING ORFORDNESS, ENGLAND, RADIOBEACON

This beacon will continue its experiments until April 20, 1930. The distance at which bearings have been taken extends up to 300 miles, but errors, due to coastal refraction, may be found.

CHANGE IN TIME SIGNALS TRANSMITTED BY NAUEN, GERMANY

This station now transmits time signals on a frequency of 16.6 (18,060 m.), c. w., from 1201 to 1206, G. M. T. The new international system of time signals is transmitted twice daily, immediately after the ordinary time signals. Each transmission comprises a series of 306 signals sent in 300 seconds of mean time. The procedure is as follows:

G. M. T.		Signal
A.	m. s.	
12	01 00	1st dash (—) followed by 60 dots (. . . . etc.)
12	02 00	62d dash (—) followed by 60 dots.
12	03 00	123d dash (—) followed by 60 dots.
12	04 00	184th dash (—) followed by 60 dots.
12	05 00	245th dash (—) followed by 60 dots.
12	06 00	306th dash (—) followed by 60 dots.

Each dash is of 0.5 second duration and its commencement coincides with the beginning of each minute.

CHANGES IN TRANSMISSIONS OF GALE WARNINGS AND TIME SIGNALS BY DAVENTRY AND LONDON, ENGLAND, RADIOTELEPHONE STATIONS

The gale transmissions from London (2LO) and Daventry (5XX) are now transmitted as follows: Week days at 1030; at 1300 and 1645 (Daventry only); at 1830; at approximately 2115 (with the Daventry shipping forecast). Sundays at 1030 (with the Daventry shipping forecast); at 1500 (Daventry only) and at 2100 (with the Taventry shipping forecast).

The time signals are transmitted as follows: Week days at 1030 and 1300 from London (2LO) and Daventry (5XX); at 1645 from Daventry (5XX); at 1830 from London (2LO), Daventry (5XX) and Daventry (5GB); at 2100 from London (2LO) and Daventry (5XX); at 2215 from Daventry (5GB) and at 2330 from Daventry (5XX). Sundays at 1030 from Daventry (5XX); at 1500 from London (2LO) and Daventry (5XX); at 1630 from Daventry (5GB) and at 2100 from London (2LO), Daventry (5XX) and Daventry (5GB).

During the period when British daylight saving time is in force, the transmitting times will be 0930, 1200, etc., G. M. T.

FREQUENCIES AND TIME OF TRANSMISSION OF ICE REPORTS BY GERMAN RADIO-TELEPHONE STATIONS CHANGED

The new frequencies and time of transmission are as follows: Bremen, 941 (318.8 m.), at 0720, 1300, and 2250; Hamburg, 806 (372 m.), at 0720, 1300, and 2250; Kiel, 1219 (246 m.), at 0720, 1300, and 2250; Königsberg, 1087 (276 m.), at 1000 and 1700. These reports are given in English and German.

FREQUENCIES AND TIME OF TRANSMISSIONS OF WEATHER REPORTS BY FRENCH STATIONS CHANGED

Issy-les-Moulineaux (FLJ) and St. Pierre des Corps (FYG) now transmit on 9,231 (32.5 m.) and 50 (6,000 m.), respectively. Occasionally when it is impracticable to make the 1920 transmission from FYG the bulletin is transmitted at 1930 from Lyon (FYP) on 72.29 (4,150 m.), c. w.

TIME OF TRANSMISSION OF WEATHER BULLETINS FROM GIBRALTAR CHANGED

This station, call signal GYU, now transmits weather bulletins containing meteorological observations at Gibraltar at 0705, 1305, and 1805 daily.

CHANGES IN LURCHER LIGHTSHIP, NOVA SCOTIA, RADIOBEACON

The call signal of the lightship, situated in the Bay of Fundy, has been changed to VGA.

The characteristic of the station is the transmission of its call signal (VGA) on a frequency of 295 k/cs. (1,017 m.), i. c. w., for a period of 1 minute and 15 seconds followed by a silent interval of 1 minute and 45 seconds, thus:

During thick weather, whenever the atmosphere in the vicinity of the lightship is obscured so as to impede navigation, the beacon will operate continuously, and in clear weather it will operate hourly for 4 minutes and 15 seconds, commencing at 4 minutes and 30 seconds past the hour.

Masters of vessels equipped to receive these signals are requested to listen in within the vicinity of this station and report the results of such reception to the Director of Radio, Department of Marine, Ottawa, Canada.

SCHEDULE OF NAVIGATIONAL WARNINGS BY BRITISH STATIONS

Navigational warnings containing information relating to derelicts, temporary extinction of lights, or displacement of principal aids to navigation, drifting mines, and other important hydrographic matter are transmitted to shipping as shown in the schedule hereunder. Attention is called to the fact that information can not be given regarding light buoys and buoys in exposed positions which are liable to be extinguished or to operate improperly or to break adrift without warning until the facts have been ascertained.

Schedule

Station	Call signal	Position (latitude, longitude)	Time (G.M.T.)	Wave ke/s (meters)	Additional details
Niton.....	GNI	50 35 N. 1 17 W.		500 (600)	Does not broadcast, but advises ships approaching or leaving the port of Southampton.
Land's End.....	GLD	50 07 N. 5 40 W.	0200, 0800, 1400, 2000	500 (600)	Broadcasts to shipping in the English Channel and Bay of Biscay.
Fishguard.....	GRL	52 01 N. 4 59 W.	0218, 0818, 1418, 2018	500 (600)	Broadcasts to shipping approaching or leaving St. George's Channel and the Bristol Channel.
Seaforth.....	GLV	53 28 N. 3 01 W.		500 (600)	Does not broadcast, but advises ships approaching the port of Liverpool of dangers within the area bounded by Northwest Mark (Formby Point)—Northwest Lightboat—Hilbre Islet. Vessels leaving the River Mersey and requiring such warnings by wireless can obtain them on request of this station at the usual coast station charges for inquiry and reply.
Port Patrick.....	GPK	54 51 N. 5 07 W.	0218, 0818, 1418, 2018	500 (600)	Broadcasts to shipping in the North Channel and Firth of Clyde.
Wick.....	GKR	58 26 N. 3 06 W.	0200, 0800, 1400, 2000	500 (600)	Broadcasts to shipping in the North Sea, and to shipping approaching or leaving the Pentland Firth.
Cullercoats.....	GCC	55 02 N. 1 26 W.	0218, 0818, 1418, 2018	500 (600)	Broadcasts to shipping in the North Sea.
Humber.....	GKZ	53 20 N. 0 17 E.		500 (600)	Does not broadcast but advises ships approaching or leaving the Humber. The navigational warning is broadcast on receipt, and repeated during the ensuing 72 hours.
North Foreland...	GNF	51 22 N. 1 25 E.	0200, 0800, 1400, 2000	500 (600)	Broadcasts to shipping in the English Channel and North sea. Information re wrecks in River Thames above Southend will only be broadcast immediately after the casualty, and at each scheduled hour of broadcast for the following 24 hours; after which no further transmission will be made.
Valencia.....	GCK	51 56 N. 10 21 W.	0218, 0818, 1418, 2018	500 (600)	Broadcasts to shipping in the Atlantic.
Malin Head.....	GMH	55 22 N. 7 20 W.	0200, 0800, 1400, 2000	500 (600)	Do.

NOTE.—All warnings are preceded by the safety signal — — — (TTT), repeated at short intervals ten times on full power; the warning is broadcast 1 minute later.

The warnings are first of all broadcast immediately upon receipt by the station concerned, and then at the above-mentioned times.

A repetition of any warning can be obtained by request to the station concerned, at the usual coast station charge for inquiry and reply. Operators should, however, make every effort to get the warning at the scheduled hours of transmission.

Warnings relating to lights on light buoys, etc., will not be broadcast at 0800 or 0818 throughout the year or at 1400 and 1418 during the period May 13 to August 6.

Warnings will be broadcast at the scheduled hours as long as may be necessary, but the cancellation of a previous warning will not be broadcast except under special circumstances.

FOG LANDING DEVELOPMENTS

The Bureau of Standards is serving as the research division of the Department of Commerce Aeronautics Branch. One of the developments upon which the bureau is engaged is the use of radio to permit airplanes to land at an airport in dense fog when the ground is invisible. This work has been in progress for about a year. Numerous methods and devices are being tried.

The pilot landing in fog must be given instantaneous information on his three coordinates in space; that is, he must be guided to and along a suitable runway, must know how far along it he has gone, and the height of the landing path above ground must be properly regulated. Of these three requirements, the first is given by a small directive radiobeacon, the second by a marker beacon, and the third by a landing beam. The pilot receives the indications of each by a visual instrument, except that the marker beacon indication may be either visual or aural. The first of these, the runway localizing beacon, has been installed by the bureau both at its own field, College Park, Md., and at Mitchel Field, Long Island, for the Guggenheim Fund. At Mitchel Field successful blind landings were made by Lieut. J. H. Doolittle last September, using this beacon in conjunction with several nonradio instruments.

At College Park all three elements of the system have been installed—the runway localizing beacon, marker beacons, and the landing beam. The first two are identical in principle with the directive range beacons and marker beacons developed for use on the airways for guiding airplanes from one airport to another; these are described in bureau release, Aircraft Radiobeacon Development by the Bureau of Standards, in Air Commerce Bulletin, August 15, 1929, and in several papers in the Bureau of Standards Journal of Research and the Proceedings of the Institute of Radio Engineers.

The method now being tried to provide the third element of the system—that is, to mark out a landing path of suitably varying height as the airplane approaches the landing—is a directed beam. This beam of 60,000 to 100,000 kilocycles, is directed at a small angle above the horizontal. A very simple receiving arrangement with visual indicator is used on the airplane. When the airplane is so maneuvered as to keep the deflection of this indicator always at a fixed point the airplane follows a gliding path down to the ground which is quite suitable for the landing operation. In one experiment the landing path marked out by the beam began at a height of 2,000 feet, approximately 3 miles from the transmitter; at 1 mile it was 240 feet high; at 1,000 feet, 15 feet above ground; and at 500 feet, 5 feet above ground. These results were obtained in flight tests made by the bureau's airplane. It will be noted that the slope of the path decreases as the pilot approaches the ground; this tends to facilitate a proper landing.

Each of the three elements of the landing system is being perfected by detailed study and trial flights. Many technical problems remain to be overcome. As the elements of the system are tried in combination, some of them may be entirely altered. The work has advanced to the point, however, where the bureau is convinced that it will be possible to give instantaneous position in three dimensions to a pilot in such manner that he may successfully land in dense fog.

ACCURACY OBTAINABLE WITH PIEZO OSCILLATORS

In order to secure actual data on their possibilities, as well as to develop and improve piezo oscillators for use as standards of radiofrequency, the Bureau of Standards has conducted observations on a number of specially designed piezo oscillators in recent months. The circuit arrangements of all these piezo oscillators are broadly the same, being designed to minimize the effects of external influences on the frequency of operation. The construction is such that the standards are portable and of a size which could be used in a radio transmitting station.

The essential differences among the piezo oscillators were in the design of the quartz plate holder. The following summary indicates the various types of mounting:

600-1 and 200-1; circular plate, thickness vibration, horizontal position with air gap between quartz plate and top electrode, glass spacers, all surfaces plane parallel.

200-3; circular plate, thickness vibration, vertical position with air gap between quartz plate and each electrode, marble spacer, plate held in position rigidly at three points equally spaced around edge. All voltages for operation of the piezo oscillator obtained from 110 volt a. c. supply.

N-5; rectangular plate, length vibration, horizontal position with air gap between quartz plate and top electrode, bakelite spacer.

100-1; rectangular plate, length vibration, horizontal position with top plate resting on quartz plate.

25-1; rectangular plate, length vibration, vertical position, electrodes sputtered on quartz plate.

The quartz plates were all kept at their working temperatures continuously except for short accidental interruptions. 100-1 and 200-3 were transported several times by truck to and from the Bureau of Standards field station at College Park, Md.; the other piezo oscillators were moved occasionally about the radio laboratory.

The following table gives the results of observation made on these piezo oscillators. Measurements were made each day during the period of observation. The maximum variation gives the worst performance and, in general, the operation was much better. Except in the two cases noted the variations were random and did not show any long-time frequency trend in either a positive or negative direction.

Oscillator No.	Months of observation	Average frequency	Maximum variation, in parts per million	Oscillator No.	Months of observation	Average frequency	Maximum variation, in parts per million
600-1	8	599.913	±6	N-5 ¹	1½	199.9998	±5
200-1	2	200.0024	±3	100-1 ²	3½	99.9998	±15
200-1 ³	3½	200.0014	±8	100-1 ⁴	2	100.0075	±10
200-3	1½	200.0013	±3	25-1 ⁵	3½	24.997	+23
N-5 ¹	1½	199.9988	±6				

¹ Minor change in circuit arrangement and temperature.

² A constant decrease in frequency.

³ A constant decrease in frequency. Temperature changed.

⁴ Change took place at time this piezo oscillator was taken from Bureau of Standards to College Park and returned. Design of plate holder such that changes would be expected when moved.

⁵ Initial frequency. Change in frequency was continuous and appears to be approaching a constant value. Change indicates that sputtered electrode is dropping off the plate.

These data indicate that it is possible to construct piezo oscillators for use as frequency standards which are capable of maintaining an accuracy of greater than 1 part per 100,000 over a period of several months. This accuracy satisfies the needs of radio transmitting stations and such standards would be adequate for station standards.

Detailed information concerning the construction of piezo oscillator 200-1 is given in a paper now in press which will appear within a few months and will be announced in these columns.

METHOD AND APPARATUS USED IN TESTING PIEZO OSCILLATORS FOR BROADCASTING STATIONS

A paper of the above title, by E. L. Hall, has been published in the January issue of the Bureau of Standards Journal of Research. The devices described have an important part to play in limiting interference to the reception of broadcast programs. A piezo oscillator is the most suitable frequency standard thus far devised for use in radio broadcasting stations, and can be used either to measure or to control the frequency of the station. Most of the piezo oscillators tested by the bureau are for use in checking (i. e., measuring) the frequency of the station. Piezo oscillators are capable of extremely high precision in the measurement of their frequency, by the use of a beat note produced by adjusting another generator to a similar frequency. This principle is employed in the methods and apparatus described in the paper.

After preliminary tests to determine the suitability of the quartz plate and its fundamental frequency, the piezo oscillator is kept in a temperature-controlled room for not less than two days, during which frequency measurements are made. The method consists in measuring the frequency of the piezo oscillator under test in terms of a standard 200-kc temperature-controlled piezo oscillator. This is done by adjusting a radio-frequency generator to the frequency which the piezo oscillator under test should have. This adjustment is made by using harmonics from a 10-kc generator which is kept accurately set in terms of the 200-kc standard by observations on a special form of beat indicator. The frequency difference between the test piezo oscillator and the generator in terms of the standard is measured by comparison with an audio-frequency generator. A frequency meter of special design is used to check the frequency difference and determine the sign of the correction to be applied. The method described is also useful in the calibration of frequency meters and the measurement of station frequencies.

The method and further details are given in Bureau of Standards Research Paper No. 135, a copy of which may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C.