DEPARTMENT OF COMMERCE

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY RADIO DIVISION

Washington, January 31, 1929—No. 142

CONTENTS

ABBREVIATIONS AND SYMBOLS

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

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

34075—29——1

NEW STATIONS

Commercial land stations, alphabetically, by names of stations

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

Station	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Station controlled by—
Alameda, Calif.[1]	KLR	2446 (122.65)	P	E	Harbor Tug & Barge Co.

[1] Type A3.

Commercial ship stations, alphabetically, by names of vessels

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

Name of vessel	Call signal	Rates	Service	Hours	Owner of vessel	Message accounts settled by—[1]
Alabama	WHDN				Tennessee Coal, Iron & R. R. Co.	
Calmar S. S. Corporation and Ore S. S. Corporation—general call.	WCBO				Calmar S. S. Corporation and Ore S. S. Corporation.	R. M. C. A
Delanson	KOTX	8	PG	X	U. S. S. B.	
Gateway City	KDFD	8	PG	X	do	
Ore S. S. Corporation and Calmar S. S. Corporation—general call.	WCBO				Ore S. S. Corporation and Calmar S. S. Corporation.	Do.
Portland Trawling Co.—general call.	WHDT				Portland Trawling Co.	Do.
Surf[2]	WHDG	8	PG	X	Floyd Del Brown	Do.
Ulua	WHDQ	8	PG		United Fruit S. S. Co.	
Viking	WHDJ	8	PG		George S. Baker, jr.	Do.
Warrior	WHDO				Tennessee Coal, Iron & R. R. Co.	

[1] Formerly listed under station controlled by. [2] Type, A1; fy., 375 (800), 425 (705), 500 (600).

Commercial land and ship stations, alphabetically, by call signals

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

Call signal	Name of station		Call signal	Name of station	
KDFD	Gateway City	b	WHDJ	Viking	b
KLR	Alameda, Calif.	p	WHDN	Alabama	b
KOTX	Delanson	b	WHDO	Warrior	b
WCBO	Calmar S. S. Corporation and Ore S. S. Corporation—general call	b	WHDQ	Ulua	b
WHDG	Surf	b	WHDT	Portland Trawling Co.—general call	b

Government land stations, alphabetically, by names of stations

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

Station	Call signal	Frequency in kilocycles, meters in parentheses	Service	Hours	Station controlled by—
Bryan, Ohio[1]	KRL	206 (1456), 230 (1304), 3365 (89.1), 3370 (89), 5940 (50.51), 5945 (50.46).	FX and FA	X	Department of Commerce, Bureau of Lighthouses.
Fort Wayne, Ind.[1]	WTD	275 (1090)	FX	Y	U. S. Army.
Long Beach, Calif. (naval reserve air base).	NTB		O		U. S. Navy.

[1] Type, A1.

Government land and ship stations, alphabetically, by call signals

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

Call signal	Name of station	Call signal	Name of station
KRL	Bryan, Ohio.....F and A	WTD	Fort Wayne, Ind.....F
NTB	Long Beach, Calif. (naval reserve air base).....O		

Special stations, alphabetically, by names of stations

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

Station	Call signal	Frequency in kilocycles, meters in parentheses	Power (watts)	Station controlled by—
Iowa: Iowa City [1]	W9XAZ	200 (150) to 2100 (142.9)	500	State University of Iowa.
Missouri: Carterville	W9XV	1604 (187), 2398) 125.1), 3088 (97.15), 4795 (62.56).	100	Rev. Lannie W. Stewart.
Aircraft:				
NC-5192	W4XN	2320 (129.3)	10	Pan American Airways.
No. 767	W2XCA	2506 (119.71), 2518 (119.14), 8650 (34.68), 17300 (17.34).	200	Morton B. Kahn.

[1] Television.

ALTERATIONS AND CORRECTIONS

COMMERCIAL LAND STATIONS

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

BOSTON, MASS. (WEY).—Type, A2 and A3; fy., 1,596 (187.97).
BUTLER, PA.—Service, FX.
CHICAGO, ILL., RADIO (WCF).—Rates, 10 cents (52 centimes) per word.
ELIZABETH, N. J.—Changed to Linden, N. J.; station controlled by Southern Radio Corporation.
GALVESTON, TEX., RADIO.—Frequencies published in Radio Service Bulletin No. 141, December 31, 1928, are additional to those published heretofore.
HONOLULU, HAWAII (KGS).—Fy., strike out 22,660 (13.24), add 22,640 (13.251).
LOS ANGELES, CALIF. (KGX).—Fy., strike out 22,660 (13.24), add 22,640 (13.251).
NEW YORK, N. Y. (WGA).—Fy., strike out 22,660 (13.24), add 22,640 (13.251).
PORT ARTHUR, TEX., RADIO.—Loc. 93° 38′ 02″ W., 29° 50′ 24″ N.; fy., strike out 2,055 (146), add 2,256 (133).
SAN FRANCISCO, CALIF. (KGQ).—Fy., strike out 22,660 (13.24), add 22,640 (13.251).
SEATTLE WASH. (KGR).—Fy., strike out 22,660 (13.24), add 22,640 (13.251).
SEATTLE, WASH. (KYF).—Type, A2 and A3; fy., 1,596 (187.97).
Strike out all particulars of the following-named stations: Chicago, Ill. (WLA); Jackson, Ohio; Kokomo, Ind.; California (portable—KJT); California (portable—KJW); San Pedro, Calif.; Springfield, Ohio.

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

ADMIRAL EVANS.—Fy., add 157 (1,911).
ADMIRAL FARRAGUT.—Fy., add 157 (1,911).
ADMIRAL RODMAN.—Hours, N (first class), X (third class).
ALDEN A. WELLS.—Correct name, Alden A. Mills (U. S. L.).
ALEX B. UHRIG.—Fy., 375 (800), 410 (730), 454 (660).
A. M. BYERS.—Fy., 375 (800), 410 (730), 454 (660).

AMERICAN FARMER.—Fy., add 410 (730), 454 (660).
AMERICAN MERCHANT.—Fy., add 410 (730), 454 (660).
ANN ARBOR No. 3.—Fy., 375 (800), 410 (730), 454 (660).
ANN ARBOR No. 5.—Fy., 375 (800), 410 (730), 454 (660).
ANN ARBOR No. 6.—Fy., 375 (800), 410 (730), 454 (660).
ARIZPA.—Message accounts settled by R. M. C. A. (U. S. L.).
AURORA.—Fy., add 410 (730), 454 (660).
BALLCAMP.—Fy., strike out 160 (1,875); rates, all services, 8 cents per word.
BANGU.—Type, B; fy., 375 (800), 425 (705), 500 (600).
BARRALLTON.—Fy., 375 (800), 410 (730), 454 (660).
BARREADO.—Fy., add 145 (2,069), 149 (2,013).
BELLBUCKLE.—Message accounts settled by R. M. C. A. (U. S. L.).
BETHORE.—Fy., add 469 (640).
BIBBCO.—Fy., 375 (800), 425 (705), 500 (600).
BIDWELL.—Fy., add 469 (640).
BLANCHE.—Fy., 375 (800), 454 (660), 500 (600); accounts, owner.
BLUE TRIANGLE.—Name changed to Exmouth.
BONNIE BROOK.—Accounts, R. M. C. A.
BRADDOCK.—Fy., add 375 (800).
BUFFALO BRIDGE.—Fy., 375 (800), 425 (705), 500 (600).
BUTTERCUP.—Fy., 375 (800), 410 (730), 454 (660).
CALICHE.—Type, A, arc; fy., 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 153 (1,961), 159 (1,887), 375 (800), 500 (600).
CAPAC.—Hours, N (first class), X (third class).
C. A. SNIDER.—Name changed to T. A. D. Jones.
CATALINA.—Type, A1 and A2.
CATHWOOD.—Owner, Union Oil Co. of California.
CAUTO.—Fy., 375 (800), 410 (730), 425 (705), 454 (660), 500 (600).
CHESTER W. CHAPIN.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
CITY OF BENTON HARBOR.—Service, PG.
CITY OF JOLIET.—Type, B; fy., add 375 (800).
CITY OF LOWELL.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600); hours, X.
CITY OF OMAHA.—Fy., add 375 (800).
CLEMENS A. REISS.—Fy., 375 (800), 410 (730), 454 (660).
COAMO.—Fy., 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 153 (1,961), 160 (1,875), 375 (800) 425 (705), 500 (600).
COEUR D' ALENE.—Name changed to Examelia.
COLUMBINE.—Service, PG; hours, X; rates, all services 8 cents per word.
CORDOVA. (KFMF).—Accounts, owner.
CORDOVA (WCCS).—Accounts, M. R. T. Co.
CORONADO.—Fy., add 375 (800).
CORRALES.—Type, A1 and A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
CREOLE (WEDN).—Correct call WICB (U. S. L.).
CREOLE (WICB).—Correct call WEDN (U. S. L.).
CUBORE.—Fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
DEROCHE.—Owner, Union Oil Co. of California.
D. G. SCOFIELD.—Fy., 375 (800), 400 (750), 425 (705) 500 (600).
DORA.—Owner, Steamship Dora Corporation.
EASTERN COAST.—Name changed to Diamond Cement.
EASTERN PLANET.—Accounts, R. M. C. A. (U. S. L.).
EDGEFIELD.—Accounts, R. M. C. A. (U. S. L.).
ELKHORN.—Type, A, arc and B; fy., 135 (2,222), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 153 (1,961), 157 (1,911), 160 (1,875), 375 (800), 425 (705), 500 (600).
ETHAN ALLEN.—Fy., 125 (2,400), 131 (2,290), 137 (2,190), 141 (2,128), 143 (2,098), 149 (2,013), 151 (1,987), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 425 (705), 500 (600).
EXAMINER.—Hours, N. (first class), X (third class).
FAYETTE BROWN.—Fy., 375 (800), 410 (730), 454 (660).
FIRMORE.—Fy., add 469 (640).
FLUOR SPAR.—Owner, South Atlantic S. S. Co.
FRANK H. BUCK.—Fy., add 157 (1,911).
GEORGE F. RAND.—Fy., 375 (800), 410 (730), 454 (660).
GRIFFDU.—Owner Charles Nelson Co.

HAHIRA.—Type, A1 and A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).

HALF MOON.—Name changed to Exanthia.

HALO.—Fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 157 (1,911), 160 (1,875), 375 (800), 500 (600).
HAMPTON ROADS (KESR).—Fy., 125 (2,400), 141 (2,128), 143 (2,098), 160 (1,875), 375 (800), 425 (705), 500 (600).
HAPPY DAYS.—Type, A1 and A2; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
HARRY COULBY.—Fy., 375 (800), 410 (730), 454 (660).
HARRY H. BROWN.—Fy., 375 (800), 410 (730), 454 (660).
H. C. FOLGER.—Fy., add 469 (640).
HELEN.—Fy., 375 (800), 425 (705), 500 (600).
HENRY G. DALTON.—Fy., 375 (800), 410 (730), 454 (660).
HENRY S. GROVE.—Fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 157 (1,911), 160 (1,875), 375 (800), 500 (600).
HIES-MARO.—Name changed to Hilda; owner, Charles Boldt.
H. J. LAWRENCE.—Owner, Alaska Salmon Co.
ILLINOIS (KDSZ).—Fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 153 (1,961), 159 (1,887), 375 (800), 500 (600).
J. A. MOFFETT.—Fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
J. J. SULLIVAN.—Accounts, no longer settled by I. R. T. Co.
J. L. REISS.—Fy., 375 (800), 410 (730), 454 (660).
JOHN J. BOLAND.—Fy., 375 (800), 410 (730), 454 (660).
John P. REISS.—Fy., 375 (800), 410 (730), 454 (660).
JOHN STANTON.—Accounts, no longer settled by I. R. T. Co.
JOHN W. AILES.—Accounts, no longer settled by I. R. T. Co.
JOSEPH SEEP.—Fy., add 469 (640).
LAGONDA.—Fy., 125 (2,400), 143 (2,098), 167 (1,796), 375 (800), 410 (730), 454 (660).
LEBEC.—Fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 157 (1,911), 160 (1,875), 375 (800), 500 (600).
LEBORE.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
LENA.—Correct orthography Elena.
LEVANT ARROW.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 469 (640), 500 (600).
LIBERTY LAND.—Name changed to Excellency.
LIMON.—Hours, N (first class), X (third class).
L. J. DRAKE.—Type, A1 and A2; fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 159 (1,887), 160 (1,875), 375 (800), 400 (750), 410 (730), 425 (705), 454 (660), 469 (640), 500 (600).
LOON.—Type, A2; fy., 375 (800), 400 (750), 425 (705), 500 (600).
LUXPALILE.—Name changed to Excello.
LYNFORD E. GEER.—Fy., 375 (800), 410 (730), 454 (660).
MANCHURIA.—Name changed to President Johnson; owner, American Foreign S. S. Co.
MANISTIQUE.—Fy., 375 (800), 410 (730), 454 (660).
MANITOU.—Fy., 375 (800), 410 (730), 454 (660).
MARSODAK.—Type, B; fy., 375 (800), 425 (705), 500 (600).
MEANTICUT.—Accounts, R. M. C. A. (U. S. L.).
MOSELLA.—Accounts, R. M. C. A. (U. S. L.).
MURSA.—Owner, Los Angeles S. S. Co.
NARCISSUS.—Accounts, R. M. C. A. (U. S. L.).
NORTH AMERICAN.—Fy., 375 (800), 410 (730), 454 (660); hours, N (first class), X (third class).
OCTORARA.—Type, A1, A2 and B; fy., 375 (800), 410 (730), 454 (660).
ONEIDA (KDJO).—Fy., 125 (2,400), 143 (2,098), 151 (1,987), 375 (800), 425 (705), 500 (600).
O. S. MCFARLAND.—Owner, Lakewood S. S. Co.
OSPREY.—Owner, Portland Trawling Co.
PAT DOHENY.—Fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 153 (1,961), 157 (1,911), 160 (1,875), 375 (800), 400 (750), 425 (705), 454 (660), 500 (600); owner, Petroleum Securities Co.

PENMAR.—Correct orthography, Pennmar.
PERE MARQUETTE 21.—Owner, Pere Marquette Railway Co.
PERE MARQUETTE 22.—Owner, Pere Marquette Railway Co.
POINT GORDA.—Accounts, M. R. T. Co.
POINT REYES.—Accounts, M. R. T. Co.
PRICE MCKINNEY.—Accounts, no longer settled by I. R. T. Co.
PURITAN.—Fy., 375 (800), 410 (730), 454 (660).
RAJAH.—Owner, Munson Corporation.
RAYO.—Owner, Sabine Towing Co.
SAUGUS.—Name changed to Exminister.
SCHOHARIE.—Owner, South Atlantic S. S. Co.
SEAFORTH.—Owner, William J. Matheson.
SHREVEPORT.—Name changed to Cities Service Koolmotor.
SOLITAIRE.—Fy., 125 (2,400), 137 (2,190), 141 (2,128), 143 (2,098), 151 (1,987), 153 (1,961), 160 (1,875), 375 (800), 425 (705), 500 (600).
SOUTH AMERICAN.—Fy., 375 (800), 410 (730), 454 (660).
STELLARIS.—Fy., 375 (800), 410 (730), 454 (660).
STUART DOLLAR.—Accounts, owner.
SUHOLCO.—Name changed to Makua.
SULTANA.—Accounts, no longer settled by I. R. T. Co.
SUSAN A. MORAN.—Owner, Tug Susan A. Moran.
THE HARVESTER.—Fy., 375 (800), 410 (730), 454 (660).
THOMAS BRITT.—Owner, Lakewood S. S. Co.
TIONESTA.—Fy., 375 (800), 410 (730), 454 (660).
TRUJILLO.—Type, A2.
TULSA.—Owner, South Atlantic S. S. Co.
VENUS (WPBI).—Fy., 141 (2,128), 143 (2,098), 151 (1,987), 158 (1,899), 160 (1,875), 375 (800), 410 (730), 454 (660).
VERAMAR.—Name changed to Somerset; owner, Merchants & Miners Transportation Co.
WACOSTA.—Type, A, arc; fy., 125 (2,400), 131 (2,290), 133 (2,256), 135 (2,222), 137 (2,190), 141 (2,128), 143 (2,098), 145 (2,069), 149 (2,013), 151 (1,987), 153 (1,961), 157 (1,911), 160 (1,875), 375 (800), 425 (705), 500 (600).
WALUCIA III.—Owner, Henry D. Walbridge.
WEST AMARGOSA.—Accounts, R. M. C. A. (U. S. L.).
WEST CARNIFAX.—Name changed to Exford.
WEST CHETAC.—Owner, American-West African Line.
WEST COBALT.—Accounts, R. M. C. A. (U. S. L.).
WEST ELCASCO.—Accounts, R. M. C. A. (U. S. L.).
WESTERN KNIGHT.—Hours, N.
WEST HARTLAND.—Name changed to Michigan; owner, States S. S. Co.
WEST HENSHAW.—Name changed to Golden Cross.
WEST IVIS.—Owner, Pacific Argentine Brazil Line.
WEST LOQUASSUCK.—Fy., add 375 (800).
W. H. BECKER.—Accounts, no longer settled by I. R. T. Co.
WIDGEON.—Owner, Portland Trawling Co.
WILDWOOD.—Owner, South Atlantic S. S. Co.
WILLIAM A. REISS.—Fy., 375 (800), 410 (730), 454 (660).
WILLIAM MCLAUCHLAN.—Fy., 137 (2,190), 143 (2,098), 151 (1,987), 158 (1,899), 160 (1,875), 375 (800), 410 (730), 454 (660).
WISCONSIN (KURS).—Fy., 375 (800), 410 (730), 454 (660).
W. M. BURTON.—Fy., add 469 (640).
W. W. MILLS.—Fy., add 469 (640).
YOUNGSTOWN (WPBH).—Fy., 137 (2,190), 143 (2,098), 151 (1,987), 158 (1,899), 160 (1,875), 375 (800), 410 (730), 454 (660).
ZELDA.—Owner, John J. Kenney.
Strike out all particulars of the following-named vessels: Apache, Arapahoe, Blanche, Casper, E. R. Sterling, Indian, Invader, Merida, Michigan (KUXB), Vacoil.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY, BY CALL SIGNALS

KEBQ, *read* Golden Cross; KEFC, *read* Exford; KEGS, *read* Michigan; KGCK, *read* Hilda; KIBQ, *read* Exminster; KIPV, *read* Excello; KISS, *read* Excellency; KOVT, *read* Examelia; KUGS, *read* Exmouth; KUNF, *read* Pennmar; KURX, *read* Diamond Cement; KUVX, *read* Exanthia; KUZF, *read* Makua; WACB, *read* Californian (U. S. L.); WCCM, *read* President Johnson; WFCO, *read* Somerset; WGAO, *read* Cities Service Koolmotor; WMU, *read* Linden,

N. J.; WQCS, *read* T. A. D. Jones; WSBE, *read* Elena; strike out all particulars following the call signals KDWR, KDXA, KFEK, KFEN, KIRX, KJT, KJW, KMY, KUXB, WBCA, WBCB, WJQ, WKH, WLA, WNA, WNBP, WTBW.

BROADCASTING STATIONS, BY CALL SIGNALS

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

KDYL (Salt Lake City, Utah).—Power, 1,000; fy., 1,290 (232.6).
KFBK (Sacramento, Calif.).—Owner, James McClatchy Co.
KFBU (Laramie, Wyo.).—Call changed to KWYO.
KFCR (Santa Barbara, Calif.).—Call changed to KDB.
KFEQ (St. Joseph, Mo.).—Power, 2,500.
KFH (Wichita, Kans.).—Power, 500.
KFIF (Portland, Oreg.).—Power, 100.
KFKB (Milford, Kans.).—Owner, KFKB Broadcasting Association.
KFKX (Chicago, Ill.).—Power, 5,000, normally, 10,000 experimentally.
KFMX (Northfield, Minn.).—Power, 1,000.
KGAR (Tucson, Ariz.).—Owner, Tucson Motor Service Co.
KGB (San Diego, Calif.).—Owner, Pickwick Broadcasting Corporation.
KGCB (Oklahoma City, Okla.).—Changed to Enid, Okla.; power, 100.
KGCR (Brookings, S. Dak.).—Power, 100.
KGDA (Dell Rapids, S. Dak.).—Power, 50.
KGFG (Oklahoma City, Okla.).—Power, 100.
KGHD (Missoula, Mont.).—Power, 50.
KGKB (Goldthwaite, Tex.).—Changed to Brownwood, Tex.; power, 100.
KGTT (San Francisco, Calif.).—Owner, Golden Gate Broadcasting Co.
KICK (Red Oak, Iowa).—Owner, Red Oak Radio Corporation.
KMA (Shenandoah, Iowa).—Power, 500 night, 1,000 day.
KPJM (Prescott, Ariz.).—Power, 100.
KPO (San Francisco, Calif.).—Power, 1,000.
KPRC (Houston, Tex.).—Power, 1,000.
KSOO (Sioux Falls, S. Dak.).—Power, 1,000.
KTBI (Los Angeles, Calif.).—Power, 750.
KUJ (Longview, Wash.).—Owner, Columbia Valley Broadcasting Co.
KUSD (Vermillion, S. Dak.).—Power, 500 night, 750 day.
KVI (Tacoma, Wash.).—Changed to Des Moines, Wash. (near); owner, Puget Sound Broadcasting Co.; power, 1,000.
KWKH (Kennonwood, La.).—Power, 20,000.
KWLC (Decorah, Iowa).—Power, 100.
KWTC (Santa Ana, Calif.).—Owner, Pacific-Western Broadcasting Federation.
KYW (Chicago, Ill.).—Power, 5,000 normally, 10,000 experimentally.
WABZ (New Orleans, La.).—Power, 100.
WBBC (Brooklyn, N. Y.).—Power, 500.
WBCM (Bay City, Mich.).—Changed to Hampton Township, Mich.; owner, James E. Davidson; power, 500; fy., 1,410 (212.8).
WBRC (Birmingham, Ala.).—Power, 500.
WDAY (Fargo, N. Dak.).—Changed to West Fargo, N. Dak.; power, 1,000.
WEBE (Cambridge, Ohio).—Power, 100.
WEBQ (Harrisburg, Ill.).—Owner, First Trust & Savings Bank; power, 50.
WEBR (Buffalo, N. Y.).—Power, 100 night, 200 day.
WFBM (Indianapolis, Ind.).—Power, 1,000; fy., 1,230 (243.9).
WGBC (Memphis, Tenn.).—Power, 500.
WGL (Fort Wayne, Ind.).—Power, 100; fy., 1,370 (219).
WGR (Buffalo, N. Y.).—Owner, Radio Station WGR (Inc.).
WHB (Kansas City, Mo.).—Power, 500 night; 2,500 daytime when operating through KMBS-KLDS.
WHBC (Canton, Ohio).—Owner, St. John's Parish.
WIL (St. Louis, Mo.).—Power, 100 night, 250 day.
WJBK (Ypsilanti, Mich.).—Owner, Ernest F. Goodwin, estate.
WKAQ (San Juan, P. R.).—Fy., 890 (337).
WKY (Oklahoma City, Okla.).—Power, 1,000.
WLAP (Louisville, Ky.).—Owner, American Broadcasting Corporation of Kentucky; power, 30; fy., 1,200 (250).
WKBF (Indianapolis, Ind.).—Power, 500.
WKBH (La Crosse, Wis.).—Power, 1,000.
WLBV (Mansfield, Ohio).—Power, 100.

WLOE (Chelsea, Mass.).—Owner, Boston Broadcasting Co.
WNBF (Endicott, N. Y.).—Changed to Binghamton, N. Y. (near).
WSMB (New Orleans, La.).—Power, 500.
WSPD (Toledo, Ohio).—Power, 500.
WTBQ (Wilmington, Del.).—Call changed to WILM; owner, Delaware Broadcasting Co.
Strike out all particulars of the following-named stations: KFWO (Avalon, Calif.); KGHA (Pueblo, Colo.).

GOVERNMENT LAND STATIONS, ALPHABETICALLY, BY NAMES OF STATIONS

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

New Brunswick, N. J. (Hadley Field).—Service, FA and FX.
Strike out all particulars of the following-named stations: Camp Custer, Mich. (Battle Creek); Fort De Lesseps, C. Z.; Presidio of Monterey, Calif.; Toledo, Ohio.

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

Albatross II.—Call changed to WTDA.
Brant (NURQ).—Call changed to WTDB.
Crane (NUDJ).—Call changed to WTDC.
Eider (NURK).—Call changed to WTDD.
Strike out all particulars of the following-named vessel: Morrill.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY, BY CALL SIGNALS

NUDJ, changed to WTDA; NURK changed to WTDB; NURP changed to WTDC; NURQ changed to WTDD; strike out all particulars following the call signals KRL (Toledo, Ohio); NEXL, WTD Camp Custer, Mich. (Battle Creek); WVM (Presidio of Monterey, Calif.) WZR.

SPECIAL STATIONS, BY NAMES OF STATIONS

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

Cliffwood, N. J. (W2XF).—Fy., 1,500 (200) to 60,000 (5); power, 50.
Deal, N. J. (W2XJ).—Fy., 78.5 (3,820) to 95 (3,160), 667 (449.8) to 858 (349.7). 1,000 (300), to 60,000 (5); power, 15,000.
East Pittsburgh, Pa. (W8XAV).—Fy., 2,000 (150) to 2,100 (142.9); power, 40,000 (television).
East Pittsburg, Pa. (W8XI).—Strike out all particulars.
Honolulu, Hawaii (W6XP).—Fy., 1,604 (187), 2,398 (125.1), 3,208 (93.5), 4,795 (62.56).
Jersey City, N. J. (W2XBY).—Fy., 1,704 (176.06), 4,324 (69.4), 8,650 (34.68), 17,300 (17.34), 34,240 (8.76).
Los Angeles, Calif. (W6XBW).—Strike out all particulars.
Los Angeles, Calif. (W6XY).—Changed to Los Angeles, Calif. (portable); (200) power, 100.
New York, N. Y. (W2XB).—Fy., 550 (545) to 1,500 (200).
New York, N. Y. (W2XBB).—Changed to Brooklyn, N. Y.
New York, N. Y. (W2XBR).—Power, 1,000.
Ocean Beach, N. J. (W2XG).—Change to Ocean Township, N. J.; fy., 1,500 to 60,000 (5); power, 5,000.
Ossining, N. Y. (W2XX).—Fy., 2,000 (150) to 2,100 (142.9); power, 100 (television).
South Schenectady, N. Y. (W2XAD).—Fy., 15,340 (19.557) (relay broadcasting).
South Schenectady, N. Y. (W2XAF).—Fy., 9,530 (31.48) (relay broadcasting).

PORTABLE:
LOS ANGELES, CALIF. (W6XAB).—Fy., 20 (15,000) to 50 (6,000); power, 500.
MONMOUTH COUNTY, N. J. (W2XAV).—Change to Ocean Township, N. J. (portable); fy., 1,500 (200) to 60,000 (5); power, 50.
SCHENECTADY, N. Y. (W2XAK).—Changed to South Schenectady, N. Y. (stationary).
SCHENECTADY, N. Y. (W2XAZ).—Changed to South Schenectady, N. Y. (stationary).
TRUCK (W6XQ).—Fy., 315 (952), to 350 (857), 1,500 (200) to 6,000 (50).
AIRCRAFT: NC3314 (W4XM).—Fy., 2,320 (129.3); power, 10.

RADIOBEACON STATIONS

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

AMBROSE CHANNEL LIGHTSHIP, N. Y.—Hours, strike out from 10 to 10.15 a. m. and from 4 to 4.15 p. m., in thick weather at which intervals the radiobeacon is not operated.
COLUMBIA RIVER LIGHTSHIP, OREG.—Hours operator stands watch on a fy. of 500 (600) (U. S. L.).
FIRE ISLAND LIGHTSHIP, N. Y.—Hours, strike out from 10 to 10.15 a. m. and from 4 to 4.15 p. m. in thick weather at which intervals the radiobeacon is not operated.
FIVE FATHOM BANK LIGHTSHIP, N. Y.—Hours, strike out from 10 to 10.15 a. m. and from 4 to 4.15 p. m. in thick weather at which intervals the radiobeacon is not operated.
SWIFTSURE BANK LIGHTSHIP, WASH.—Hours operator stands watch on a fy. of 500 (600) (U. S. L.).

MISCELLANEOUS

Vessels equipped with a radio compass

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

Name	Call signal	Owner
COMMERCIAL		
Adam E. Cornelius	KDVF	American S. S. Co.
California	WMCM	American Line S. S. Corporation.
Cathwood	KURC	Union Oil Co. of California.
Clifford F. Moll	KDWA	American S. S. Co.
Deroche	KOBJ	Union Oil Co. of California.
Malama	KIBF	Matson Navigation Co.
President Polk	KDOZ	Dollar S. S. Line.
Radiant	WFDP	Union Oil Co. of California.
Theodore H. Wickwire	KDZC	American S. S. Co.
Utacarbon	KUMC	Union Oil Co. of California.
Virginia	WSBW	American S. S. Lines.

LOST COMMERCIAL RADIO OPERATORS' LICENSES

Hereunder is a list of radio operators' licenses which have been reported to this bureau as having been lost. Should any of them be found, they should be returned to the bureau for cancellation. Inspectors and others concerned should see that lost licenses are not being used by unauthorized persons.

Name	Class	No.	Date issued	Port issued
Broussard, Joseph E	First	5925	Dec. 14, 1928	New Orleans.
Chipp, Rodney D	do	5092	May 11, 1928	New York.
Eaker, Robert H	do	1158	Aug. 13, 1927	Do.
Griffith, Elmer G	do	7718	July 23, 1926	Baltimore.
Pederson, William K	do	5052	Apr. 24, 1928	New York.
Solak, Louis J	do	4172	Feb. 21, 1928	Detroit.
Foy, Oscar	do	19	July 6, 1927	Washington.
Boldt, Earl H	do	4531	Dec. 24, 1927	New York.
Larkin, Michael E	do	5320	Aug. 15, 1928	Do.
Kuback, Frederick	do	4594	Feb. 4, 1928	Do.
McNeely, Fred W	do	2430	Mar. 10, 1928	New Orleans.
Parker, Allen B	do	5539	Apr. 23, 1928	Do.
Gylfe, A. Eugene	Second	1284	Mar. 26, 1928	Seattle.
Myers, Donald	First	1771	Oct. 25, 1928	Philadelphia.
Tuttle, Le Roy	do	4345	Sept. 23, 1927	Chicago.
Goss, Kenneth E	do	5162	June 9, 1928	New York.
McCarroll, George M., jr	do	16372	Oct. 14, 1926	Do.
Harrison, Thornton R	do	17085	Feb. 4, 1927	Do.
Leaf, Morris H	do	16429	Oct. 22, 1926	Do.
Murray, Richard R	do	17084	Feb. 4, 1927	Do.
Coffin, Charles C	Second	6640	Jan. 28, 1927	San Francisco.
Zablocki, Michael F	First	2938	Nov. 9, 1927	Do.

List of Philippine stations assigned new call signals

Station	Old call	New call (effective January 1, 1929)
Philippine Insular Government coastal stations:		
Alabat	KZBB	KBA
Aparri	KZAD	KAW
Balangiga	KZBL	KBL
Basco	KZAB	KAB
Borongan	KZBN	KBN
Butuan	KZBT	KBT
Calapan	KZAC	KAN
Caramoan	KZMN	KAR
Catanauan	KZTN	KAT
Catbalogan	KZCT	KAC
Dapa	KZDP	KBD
Dapitan	KZDN	KAD
Hinatuan	KZHN	KAH
Infanta	KZBP	KAI
Isabela de Basilan	KPN	KPG
Legaspi	KZAJ	KAL
Mambajao	KZMB	KUM
Pandan	KZPN	KBP
Pasay	KZCM	KAM
Sogod	KZSD	KBS
Surigao	KZAM	KAS
Tandag	KZTG	KAG
Tolong	KZTL	KTS
Virac	KZAH	KAV
Radio Corporation of the Philippines:		
Manila [1]	KZIK	KAX
Manila [1]	KZIL	KAY
Manila [1]	KZIM	KAZ
Manila [1]	KZOR	KBI
Manila [1]	KZOS	KBJ
Radio Corporation of the Philippines—Continued		
Manila [1]	KZOT	KBK
Manila [1]	KZED	KTO
Manila [1]	KZEG	KTP
Manila [1]	KZET	KTR
Manila [1]	KZUV	KUS
Manila [1]	KZUW	KUV
Manila [1]	KZUX	KUW
Manila [2]	KZRC	KAA
Manila [3]	KZEJ	KTN
Cebu [3]	KZEK	KTL
Iloilo [3]	KZEL	KTJ
Macleod & Co.:		
Manila	KZCP	KUH
Cebu	KZCN	KUI
Davao	KZCK	KUK
Cadwallader Gibson Lumber Co.:		
Manila	KZDX	KUE
Sipaco	KZDY	KUF
Limay	KZDZ	KUG
Panabutan Lumber & Plantation Co.:		
Manila	KZMM	KUA
Panabutan [4]	KZPL	KUC
Mindanao Lumber Co.: Naga-Naga [4]	KZEN	KUQ
Camiguin Lumber Co.: Camiguin Island	KZCX	KUX
Hercules Lumber Co.: Lumarao [4]	KZAP	KUZ

[1] Transoceanic.
[2] Marine.
[3] Interisland.
[4] Public use, operated by Bureau of Posts.

Amateur stations, experimental stations, and technical and training school stations

Name of owner	Location	Call
Thomas A. Wallace	S. Francisco del Monte, Rizal	K1AB
Joseph Weinstein	Fort Mills, Corregidor	K1AF
Jose E. Jimenez	835 South Fernando, Manila	K1AT
Harry I. Hall	Camp Nichols, Rizal	K1BD
Emil Gisel	United States Army, Manila	K1BG
John W. Willey	Plaza Dilao, Manila	K1BJ
Sixtieth Coast Artillery	Fort Mills, Corregidor	K1CM
Stanley M. Mathes	Army and Navy Club, Manila	K1CY
Alfonso de Lange	Manila	K1DL
Gregoria Zalbidea	554 El Dorado, Manila	K1GZ
Eladio Licauco	San Juan del Monte, Rizal	K1EL
Elmer C. Holmes	Sta. Lucia, W. C., Manila	K1HM
John R. Schultz	Calauan, Laguna	K1JR
James McGraw	Fort Mills, Corregidor	K1MC
Compañia Gral. de Tabacos de Filipinas	S. S. Mauban	K1MN
Paul W. Streeter	Clark Field, Pampanga	K1PW
Roy R. Newman	Camp Stotsenburg, Pampanga	K1RN
Newton E. Thompson	Manila	K1XA
Radio Corporation of the Philippines	do	K1XR
Radio Institute of the Philippines	do	K1ZB
Philippine School of Arts and Trades	do	K1ZC
Fred Johnson Elser	Baguio	K3AA
Francis J. Cooper	Victorias, Occidental Negros	K7AD
C. L. Hogan	San Carlos, Occidental Negros	K7AH
Leon C. Grove	Tagbilaran, Bohol	K7LG
O. E. Linquist	Iloilo, Iloilo	K7OE
Thomas A. Wallace	Binaluan, M. S., Palawan	K8AA
S. Hilario Escudero	Naga-Naga, Zamboanga	K9DR
W. N. Haltiwanger	Pettit Barracks, Zamboanga	K9PB
Panabutan Lumber & Plantation Co	Panabutan, Zamboanga	K9PL
Twelfth Signal Company	Fort McKinley, Rizal	K1HR

REGULATIONS GOVERNING THE ISSUANCE OF BROADCASTING STATION OPERATOR LICENSE AMENDED

Paragraph 4, first sentence, of the Regulations Governing the Issuance of Radio Operators' Licenses, published in RADIO SERVICE BULLETIN No. 141, December 31, 1928, is amended to read: "Applicants for this class of license must pass code tests in transmission and reception at a speed of at least 16 words per minute in Continental Morse Code, in code groups, and 20 words per minute in Continental Morse Code, in plain language (five characters to the word)."

GENERAL ORDERS OF THE FEDERAL RADIO COMMISSION

Picture and television transmissions restricted in use of frequencies in the broadcast band (General Order No. 56, January 14, 1929).—From and after the date hereof and until further order of the commission, neither picture broadcasting nor television broadcasting will be permitted in the broadcast band between 550 and 1,500 kilocycles, except upon written application to and formal authority from the commission, and then only between the hours of 1 and 6 a. m., local time at the location of the transmitter. The written applications shall be on forms provided for that purpose by the commission.

For the purpose of determining whether picture broadcasting and/or television broadcasting may be permitted in the broadcast band in the future either at all or to a greater extent than above authorized, the commission has determined to hold a hearing for the presentation of evidence as to whether such broadcasting can be accommodated on a 10-kilocycle band of frequencies; whether such transmission will result in undue interference with the broadcasting of other stations; whether there is any general public interest in having such transmission take place in the broadcast band rather than in the high-frequency band, and such other questions as will bear upon the issue of whether permission of such transmission in the broadcast band will serve public interest, convenience, or necessity. This hearing will be held at the office of the commission at Washington, D. C., on February 14, 1929.

Postponement of regulation governing chain programs (General Order No. 57, January 18, 1929).—The Federal Radio Commission hereby postpones the effective date of General Order No. 43, limiting duplicated operation on cleared channels to stations more than 300 miles apart, until March 1, 1929.

Extension of coastal, point-to-point, experimental and ship radio station licenses until March 16, 1929 (General Order No. 58, January 28, 1929).—It is ordered:

1. That all existing licenses covering coastal, point-to-point, experimental and ship radio transmitting stations, heretofore extended by the commission's General Orders 1, 3, 26, 39, 47, and 54, be, and the same are hereby, further extended for a period of 45 days to terminate at 3 o'clock a. m., eastern standard time, March 16, 1929.

2. That all licenses of these classes which have expired since December 22, 1928, and upon which renewal applications have been filed but not acted upon by the commission, be, and the same are hereby extended from expiration date to 3 o'clock a. m., eastern standard time, March 16, 1929.

This order, however, is subject to the conditions that it 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 said stations serves, or will serve, public interest, convenience, or necessity, or that public interest, convenience, or necessity would be served by the granting of any pending application for a renewal of any of said licenses; and any licensee subject to this order who continues to use or operate his station during the period covered by this order shall be deemed to have consented to said conditions. The commission reserves the right to change the frequency assignment of any station, the license of which is affected by this order, during the extension herein provided if, in the opinion of the commission, such changes are advisable.

This order is subject to the following exception: It shall not apply to any existing licenses heretofore issued by this commission (as distinguished from licenses issued by the Department of Commerce prior to the establishment of the commission under the radio act of 1927, approved on February 23, 1927); all licenses in such cases to be governed by the terms and conditions of their respective licenses from the commission.

INTERNATIONAL ICE-PATROL SERVICE

The Coast Guard cutters *Modoc* and *Tampa* have been detailed for the season of 1929 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 lanes. 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 radiobroadcasts, giving ice information, for the benefit of shipping, each broadcast being repeated two times with an interval of two minutes between each repeat. 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:

Time		Frequency, kilocycles
G. C. T.	Seventy-fifth meridian	
0000	1900	175
1100	0600	425
1200	0700	175
2300	1800	425

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:

Station	Call signal	Time: G. C. T.	Time: Seventy-fifth meridian-standard	Frequency, kilocycles	Type of wave
Washington, D. C.	NAA	[1] 1700	[1] 1200	113	ACW.
		0200	2100	113	ACW.
Boston, Mass.	NAD	1600	1100	102	CW.
		2200	1700	102	CW.
New York, N. Y.	NAH	1530	1030	102	CW.
		2130	1630	102	CW.
Norfolk, Va.	NAM	0900	0400	122	CW.
		1600	1100	122	CW.

[1] Ice data follows the hydrographic bulletin.

ALTERATION IN TIME SIGNALS TRANSMITTED BY DAVENTRY, ENGLAND, RADIOPHONE STATION

These signals are now transmitted at 1,030, 1,300, 1,645, 1,815, 2,200 daily, and on Sundays at 1,030, 1,530, 2,100, 2,200.

ALTERATION IN BAR LIGHT VESSEL, LIVERPOOL BAY, ENGLAND, RADIOBEACON

The beacon signals are now transmitted every four minutes, during thick or foggy weather, commencing at 01, 05, 09, etc., minutes past each hour in lieu of at 00, 04, 08, etc. The clear weather transmission of the Morse letters GGM for one minute will commence at 01, 05, 09, 29, 33, and 37 minutes past each hour instead of at 00, 04, 08, 28, 32, and 36.

RADIOBEACON ESTABLISHED AT MIDDLEGRUND FORT LIGHTHOUSE, DENMARK

A radiobeacon has been established at this light station, located in approximately, 55° 43′ 15″ N., 12° 40′ 15″ E. The signal is transmitted on a frequency of 316 (950) consisting of the Morse letters MG MG MG followed by the letter A which is transmitted twelve times in succession, occupying 1 minute and 22.5 seconds. A silent period of 2 minutes and 37.5 seconds follows.

CHANGES IN FREQUENCIES OF GERMAN RADIOBEACONS

About February 1, the frequencies of the stations named hereunder will be changed as follows:

Station	Geographical location (approximately): N.	Geographical location (approximately): E.	Frequency in kilocycles, meters in parentheses
	° ′	° ′	
Borkum Riff Light Vessel	53 46	6 04	304 (987).
Norderney Light Vessel	53 56	7 14	304 (987).
Weser Light Vessel	53 54	7 50	296 (1,012).
Warnemunde Lighthouse	54 11	12 05	296 (1,012).
Elbe Island Light Vessel	54 01	8 13	289 (1,037).
Amrumbank Light Vessel	54 33	7 53	289 (1,037).
Stubbenkammer	54 34	13 40	289 (1,037).

WEATHER BULLETINS TRANSMITTED BY ORLY, FRANCE, STATION

These bulletins are now transmitted from this station located in approximately 48° 40′ N., 2° 22′ E. as follows: At 0650, first aviation bulletin—1,800 observations—on a frequency of 150 (200), c. w.; at 0850, general weather bulletin—valid until 1500—on a frequency of 150 (200), c. w.; at 1205, general weather bulletin—for the whole of France—valid until 2000—on a frequency of 178 (1680) c. w.; at 1650, general weather forecast, on a frequency of 150 (200), c. w. The transmissions at 0650 and 1205 are suspended on Sundays and holidays.

TSINGTAO, CHINA, STATION, WEATHER BULLETINS

Weather bulletins are transmitted from this station located in approximately 36° 03′ N., 120° 17′ E. as follows: Local synoptic bulletins at 0030 and 1030 on a frequency of 300 (1,000); weather reports and forecasts at 0600 on a frequency of 500 (600) and 107 (2,800); Far East synoptic bulletins at 0620 on 107 (2,800). Observations from 28 stations are transmitted.

METHOD OF TRANSMITTING NAVIGATIONAL WARNINGS BY CHILEAN STATIONS

The following abbreviations will be used by the Department of Navigation and Hydrography in radiotelegraph Notices to Mariners:

The positions of shoals, wrecks and other navigational dangers will be given by bearings from three objects on the chart; if three are not available, two will be used; or by bearing and distance when only one object is available.

Bearings will be true and reckoned clockwise from 0 to 360°, and the figures denoting the bearing will follow the name of the object selected. When a single object is used the bearing and distance (meters) will be given thus: (45 Morro Capiapo 1500; meaning: Bearing 045° from Morro Capiapo, distance 1,500 meters. Bearings of lighthouses will be given to the lighthouse.

Buoys and beacons will be described by name. Depths and heights will be given in meters. Depths not on the chart will be reduced to ordinary datum and will be preceded by the word "profundiad," thus: Profundiad 145; meaning: Depth 145 meters. Heights will be preceded by the word "altitud," thus: Altitud 250; meaning: Height 250 meters.

Latitude and longitude will be given in degrees, minutes, and seconds, preceded by the letter "L" for latitude and "G" for longitude. Degrees, minutes, and seconds will be represented by a six-figure group, each two of which will correspond to degrees, minutes, and seconds, respectively, thus: L 330407, G 754907; meaning: Lat. 33° 04′ 07″, Long. 75° 49′ 07″.

NAVIGATIONAL WARNINGS BY BRITISH STATIONS

Radio 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. Full particulars are given in the undermentioned schedule.

Attention is invited to the fact that unless sufficient time has elapsed for information to be received regarding light buoys and buoys in exposed positions which are liable to be extinguished or to operate correctly, or to break adrift without warning, it naturally follows that data can not be transmitted until such information has been received.

Schedule

Station	Call signal	Latitude, longitude	Time (G. M. T.)	Kilocycles (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.

Schedule—Continued

Station	Call signal	Latitude, longitude	Time (G. M. T.)	Kilocycles (meters)	Additional details
		° ′			
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 27 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)	Broadcasts to shipping in the Atlantic.

NOTE.—All warnings are preceded by the radio safety signal — — — (TTT), repeated at short intervals 10 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.

RADIOBEACON AND SUBMARINE FOG SIGNAL ESTABLISHED ON AMRUM BANK LIGHT VESSEL, GERMANY

The radiobeacon of this light vessel located in approximately 54° 33′ N., longitude 7° 53′ E., operates on a frequency of 289 (1,037), i. c. w.; range, 50 miles at day, 75 miles at night; call, DCB. The characteristic is as follows: A group of signals is transmitted for 30 seconds and is repeated 7 times in 3½ minuyes, followed by a silent interval of 4 minutes; total period, 7½ minutes. The group of signals is as follows:

· — · — · · — ·	Silent	16 dashes (— — — &c.) each of 1 sec. duration, with intervals of 0.253 sec. between each dash.	Silent
6.6 sec.	1.253 sec.	19.795 sec.	2.352 sec.

The group of seven signals will be transmitted 6 times between the 15th and 56th minutes of every hour, simultaneously with the radiobeacon signals transmitted from Borkum Riff and Weser lightvessels.

Description of submarine fog signal: Oscillator sounding 4 notes every 30 seconds, thus: Note 1 second, silent 1 second, note 1 second, silent 1 second, note 3 seconds, silent 1 second, note 1 second, silent 21 seconds.

These signals commence after the last dot of the radiobeacon signal and are transmitted continuously, including the period in which no radiobeacon signal is sent, viz, from the 56th to the 15th minute of the hour.

The radiobeacon signal and submarine fog signal can be used for the determination of bearing and distance by either of the following methods:

(*a*) When the 16 dashes of the radiobeacon signal are being transmitted, count the number of dashes until the signal synchronises with the receipt of the first note of the submarine signal. The number of the radiobeacon dash is the required distance in miles.

(*b*) Count the number of seconds which elapse between receiving the final dot of the radiobeacon signal and the receipt of the first note of the submarine signal; multiply this number by 0.8, and the product is the required distance in miles.

Until further notice the radiobeacon signal will also be operated daily in clear weather between the following periods: 0815—0856, 1315—1356, 1815—1856, G. M. T.

If a vessel wishes to determine her distance during these periods, or desires to receive the radiobeacon and submarine fog signals at times other than those specified, she should wireless a request to this effect to Norderney Light Vessel (DCP). The radiotelegraph station is engaged during the first 15 minutes of every hour between 0700 and 1000, and between 1300 and 1900.

FOREIGN BROADCASTING STATIONS

The following list of foreign broadcasting stations includes all stations outside the United States and its possessions which transmit programs for popular reception, which are listed in the files of the electrical equipment division. Included are a number of short-wave stations, some of which transmit on short waves only, and some transmitting on short and broadcast waves simultaneously.

NORTH AMERICA

Location	Call signal	Wave length	Power
		Meters	*Watts*
Canada:			
Bowmanville, Ontario	CKGW	312.3	960
Brantford, Ontario	CFGC	296.9	50
Burnaby, British Columbia	CFYC	410.7	500
Calgary, Alberta	CFAC, CNRC	434.5	500
Do	CFCN, CNRC	434.5	1,000
Do	CJCJ, CHCA	434.5	250
Charlottetown, Prince Edward Island	CFCY	312.3	100
Chilliwack, British Columbia	CHWK	247.8	5
Cobalt, Ontario	CKMC	247.8	5
Edmonton, Alberta	CHCY, CNRE	516.9	250
Do	CHMA	516.9	500
Do	CJCA	516.9	500
Do	CKUA	516.9	500
Fredericton, New Brunswick	CFNB	247.8	25
Halifax, Nova Scotia	CHNS	322.4	100
Hamilton, Ontario	CHML	340.7	50
Do	CHOS	340.7	10
Do	CHOC	340.7	100
Iroquois Falls, Ontario	CFCH	499.7	250
Kamloops, British Columbia	CFJC	267.7	15
King, York County, Ontario	CFRB	291.1	1,000
Kingston, Ontario	CFMC	267.7	20
Do	CFRC	267.7	200
London, Ontario	CJGC	329.5	500
Midland, Ontario	CKPR	267.7	50
Moncton, New Brunswick	CNRA	475.9, 322.4	500
Montreal, Quebec	CFCF, CNRM	410.7	1,650
Do	CHYC	410.7	750
Do	CKAC, CNRM	410.7	1,200
Moose Jaw, Saskatchewan	CJRM	296.9	50
Ottawa, Ontario	CKCO	434.5	100
Do	CNRO	434.5	500
Prescott, Ontario	CHWC	296.9	50
Preston	CKPC	247.8	10
Quebec, Quebec	CHRC	340.7	5
Do	CKCI	340.7	25
Do	CKCV, CNRQ	340.7	50
Red Deer, Alberta	CKLC, CHCT, CJCR	356.8	1,000
Reginal, Saskatchewan	CHWC	312.3	15
Do	CKCK, CNRR, CJBR	312.3	500
St. George	CKCR	257.7	25
St. Hyacinthe, Quebec	CKSH	312.3	50
Saskatoon, Saskatchewan	CFQC, CNRS	329.5	500
Do	CHUC	329.5	500
Do	CJWC	329.5	250

NORTH AMERICA—Continued

Location	Call signal	Wave length	Power
		Meters	*Watts*
Canada—Continued.			
Scarboro, Ontario	CJYC, CKCX, CKOW	291.1	500
Sea Island, British Columbia	CJOR	291.1	50
Summerside, Prince Edward Island	CHGS	267.7	25
Toronto, Ontario	CFOH, CKSM, CNRT	356.9	500
Do	CHIC, CHNC, CKNC	356.9	500
Do	CKCL, CJSC	356.9	500
Unity, Saskatchewan	CHSC	267.7	50
Vancouver, British Columbia	CFCQ	410.7	10
Do	CKCD, CHPC	410.7	1,000
Do	CKFC	410.7	50
Do	CKWX	410.7	10
Do	CNRV	291.1	500
Victoria, British Columbia	CFCT	329.5	500
Winnipeg, Manitoba	CKY	389.4	500
Yorktown, Saskatchewan	CJGX	475.9	500
Cuba:			
Caibarien	6EV	250	50
Do	6LO	325	250
Camaguey	7AZ	225	10
Do	7GT	195	5
Do	7LO	230	20
Camajuani	6YR	200	20
Ciego de Avila	7BY	235	20
Do	7FU	200	15
Do	7HS	192	15
Cienfuegos	6BY	260	200
Colon	5EV	360	100
Guanajay	1AZ	275	30
Habana	PW1H	376	500
Do	CMC	347	500
Do	2AB	250	10
Do	2AZ	334	30
Do	2CP	280	10
Do	2HP	205	200
Do	2JP	245.5	15
Do	2OH	300	15
Do	2OK	360	100
Do	2RK	326	50
Do	2SE	211	10
Do	2UF	228	100
Do	2WX	261	150
Do	2XA	230	200
Do	2XX	225	10
Hershey	2FG	226	20
Mariano	2JF	252	15
Do	2JL	294	7½
Do	2MA	277	50
Do	2SW	274	7½
Nuevitas	7NM	264	20
Sagua la Grande	6HS	200	10
Sancti Spiritus	6KP	280	20
Santa Clara	6MN	210	20
Santiago	8HS	200	30
Do	8BY	150	30
Do	8KW	250	15
Tuinucu	6KW	368	100
Guatemala: Guatemala		310	1,000
Haiti: Port au Prince	HHK	361.2	1,000
Mexico:			
Chihuahua	CZF	310	250
Mazatlan	CYR	475	250
Merida	CYY	548	100
Mexico City	CYA	300	500
Do	CYB	275	500
Do	CYH	375	100
Do	CYJ	400	2,000
Do	CYL	400	500
Do	CYO	425	100
Do	CYX	325	500
Do	CZE	350	500
Monterey		311	250
Do	CYH		
Oaxaca	CYF	265	100
Pueblo	CYU	312	100
Tampico	CYQ	322	100
Do	CYZ		20
Torreon	CYM	225	1,500
Vera Cruz	CYC	337	50
Do	CYD		
Salvador: Salvador	AQM	482	500

SOUTH AMERICA

Location	Call signal	Wave length	Power
		Meters	*Watts*
Argentina:			
Buenos Aires	B2	275	100
Do	D3	253.3	100
Do	LOJ	270	1,000
Do	LOL	236	2,000
Do	LON	210	5,000
Do	LOO	252	1,000
Do	LOQ	261.8	3,000
Do	LOR	344.8	1,000
Do	LOS	291.2	5,000
Do	LOT	400	1,000
Do	LOV	361.5	1,000
Do	LOW	303	1,000
Do	LOX	380	1,000
Do	LOY	315.2	1,000
Do	LOZ	330	1,000
Cordoba	H5	275	100
Do	H6	250	20
La Plata	LOP	425	1,000
Mendoza	LOU	380	500
Do	M6	348	10
Rosario	F2	270	100
Santa Fe	F1	279	20
Bolivia:			
La Paz		175	50
Do		300	50
Do			
Brazil:			
Bahia	SKV	600	50
Do	SQBE	24	
Curytiba	SQAF	340	8
Juiz de Fora	SQAY	380	200
Para		34	
Pernambuco		310	300
Porto Alegre			
Rio de Janeiro	SQAA	400	2,000
Do	SQAB	310	500
Do	SQAJ	260	500
Santos	SQAI	280	10
Sao Paulo	SQBO	225.4	1,000
Do	SQAG	360	1,000
Do	SQAK	350	10
Sorocaba		425	
Chile:			
Antofagasta	CMAO		
Concepcion	CMAI	345	1,500
Santiago	CMAD	320	1,000
Do	CMAE	280	100
Tacna	CMAT	550	200
Talcahuano			
Temuco	CMAK	245	100
Valparaiso		400	50
Asuncion			12
Paraguay:			
Peru: Lima	OAX	360	1,500
Uruguay:			
Montevideo	CWOA	428.4	1,000
Do	CWOF	300	100
Do	CWOG	280	10
Do	CWOH	300	50
Do	CWOK	260	50
Do	CWOL	272	100
Do	CWOM	265.5	20
Do	CWON	256.5	200
Do	CWOO	294	50
Do	CWOR	350	500
Do	CWOS	380	500
Do	CWOW		500
Salta	CWOI	272	50
Do	CWOJ	250	10
Venezuela: Caracas	AYRE	375	1,000

EUROPE

Austria:			
Graz		365.8	500
Innsburck		294.1	500
Klagenfurt		272.7	500
Linz			500
Vienna	ORV	517.2	14,000
Do	EATH	37	
Do	OHK2	70	

EUROPE—Continued

Location	Call signal	Wave length	Power
		Meters	*Watts*
Belgium:			
Antwerp		265.5	100
Brussels	BAV	508.5	1,500
Do		230	
Ghent		275	
Liege		205	100
Do		294.1	100
Czechoslovakia:			
Bratislav	OKR	300	500
Brunn	OKB	441.2	2,400
Kosice	OKK	263	2,000
Prague	OKP	384.9	5,000
Danzig: Danzig		272.7	
Denmark:			
Copenhagen	D7RL	42.12,84.25	
Do	D7MK	32.05	
Do		337	500
Kalundborg		1,535	7,500
Soro		1,153.8	1,500
Estonia:			
Tallinn		1,200	100
Do		408	700
Finland:			
Bjorneborg (Pori)		254.2	100
Helsingfors		500	1,000
Do		240	2,000
Jakobstad (Pietersaarki)		275	200
Jyvaskyla		297	200
Lahtis		1,525	40,000
Do		318	180
Tammerfors (Tampere)		400	250
France:			
Agen	2BD	297,30.75	500
Bamboul			
Beziers		180	
Biarritz		198	
Bordeaux		419	1,500
Chateau-Thierry			
Fecamp		200	
Lille		267.3	
Limoges		285	
Lyon	YN	480	1,000
Do	YR	290,40.2	5,000
Marseille		300	1,000
Mont de Marsan		390	300
Montpellier		238	200
Nancy		15.5	
Nice		246	
Nimes		240	
Nogent sur Seine	F8AV	80	
Paris	FL	32,1,500,2,650	20,000
Do	FPTT	458	1,000
Do	F8GC	350,61	500
Do		340.9	500
Do		1,750	3,000
Do		308,37	250
Rennes		294	1,500
Strasbourg		222.2	
Toulouse	MRD	260	1,000
Do		389.6	2,000
Germany:			
Augsburg		566	700
Berlin		438.9	800
Do	AFT	2,900	8,000
Do		566	2,000
Do		2,525	
Bremen		252.1	700
Breslau		322.6	4,000
Doberitz	AFK	37.65,67.65	
Dirtmund		283	700
Dresden		275.2	700
Elberfield		468.8	750
Frankfort-on-the-Main		428.6	4,000
Freiburg		577	750
Gleiwitz		250	700
Hamburg		394.7	4,000
Hanover		297	700
Kaiserlautern		204.1	4,000
Kassel		272.7	700
Kiel		254.2	700
Konigsberg		329.7	4,000
Langenberg		468.8	8,000

EUROPE—Continued

Location	Call signal	Wave length	Power
Germany—Continued.		*Meters*	*Watts*
Leipzig		365.8	4,000
Muenster		241.9	1,500
Munich		535.7	4,000
Nauen	AGC	17.2	
Do	AGJ	56.7	
Nuremberg		303	750
Schaerbeck		230	
Stettin		236.2	700
Stuttgart		379.7	4,000
Hungary:			
Budapest	MT1	555.6	2,000
Do	MT2	1,050	400
Do	MT3		12,000
Iceland:			
Akureyri	G2SH	192	
Reykjavik		333.3	500
Irish Free State:			
Cork	6CK	400	1,000
Dublin	2RN	319.1	1,500
Italy:			
Genoa			6,000
Milan	IMI	315.8	7,000
Naples	INA	333.3	1,500
Rome	IRO	449	3,000
Do	I1AX	45	
Latvia: Riga	KCX	526.3	2,000
Lithuania: Kovno		2,000	2,000
Luxemburg: Luxemburg	LOAA	217.4	250
Netherlands:			
De Bilt	PCFF	1,100	
Hilversum	HDO	1,060	1,000
Do	PCJJ	30.2, 31.4	
Huizen		1,840, 340.9	
Kootwijk		184	25,000
Scheveningen		1,875	
Norway:			
Bergen		370.4	1,500
Do	LGN	30	
Halesund			
Oslo		370.4	1,500
Porsgrund		405	1,000
Stavanger		277.6	1,500
Tromsoe			
Trondhjem		243.9	1,000
Poland:			
Katowice		422	2,000
Krakow		422	1,300
Poznan		270.3	1,500
Warsaw		1,111.1	8,000
Wilna			
Portugal:			
Lisbon			
Do	P1AA	305	500
Rumania [1]			
Spain:			
Almeria		320	1,000
Barcelona	EAJ1	344.8	1,000
Do	EAJ13	462	1,000
Bilbao	EAJ9	434.8	1,000
Cadiz	EAJ3	400	1,000
Cartagena	EAJ16	330	1,000
Madrid	EAJ2	420	600
Do	EAJ7	375	1,200
Do	EAM	30.7	
Malaga	EAJ25	100	100
Oviedo	EAJ19	280.4	200
Salamanca	EAJ27	500	500
San Sebastian	EAJ8	297	3,000
Seville	EAJ17	434.8	600
Sweden:			
Boden	SASE	1,190	600
Boras	SMYB	230.8	150
Eskilstuna	SMUC	250	200
Falun	SMZK	335.3	500
Gavle	SMXF	204.1	200
Goteborg	SASB	416.1	600
Halmstad	SMSB	215.8	200
Halsingborg	SMYE	229	200

[1] Rumania has no broadcasting station up to the date of latest reports, although it is proposed to erect several.

EUROPE—Continued

Location	Call signal	Wave length	Power
Sweden—Continued.		*Meters*	*Watts*
Hudiksvall	SM8L	272.7	150
Jonkopings	SMZD	201.3	250
Kalmar	SM8W	254.2	200
Karlsborg	8AS	52.5	
Karlskrona	SM8M	196	200
Karlstad	SMXG	220.6	250
Kiruna	SMTG	238.1	400
Kristinehamn	SMTJ	202.7	250
Malmberget	SMXO	400	250
Malmo	8ASC	260.9	600
Motala	8ASG	1,380	30,000
Norrkoping	SMVV	275.2	250
Orebro	SMTI	236.2	200
Ormskoeldsvik	SMZA	222.2	200
Ostersund	8ASF	720	600
Saffle	SMTS	252.1	400
Stockholm	8ASA	454.5	1,000
Sundsvall	8ASD	545.6	600
Trollhattan	SMXQ	278.8	400
Uddevalla	SMZP	294.1	500
Umea	SM8M	229	200
Uppsala	SMRM	500	150
Varberg	SM8O	297	300
Switzerland:			
Basel	HB3	1,000	300
Berne		411,032	1,500
Geneva	HB1	760	500
Lausanne	HB2	850	600
Zurich	H9XD	85,032	1,500
Do		500	1,500
United Kingdom:			
Aberdeen	2BD	500	1,500
Belfast	2BE	306.1	1,500
Birmingham	5IT	326.1	1,500
Bournemouth	6BM	491.8	1,500
Cardiff	5WA	353	1,500
Caterham	2NM	32.5	
Daventry	5XX	1,600	16,000
Do	5SW	24	
Dundee	2DE	294	200
Edinburgh	2EH	288.5	500
Glasgow	5SC	405.4	1,500
Hull	6KH	294	200
Leeds, Bradford	2LS	277.8, 252.1	500
Liverpool	6LV	297	200
London	2LO	361.4	3,000
Manchester	2ZY	384.6	1,500
Newcastle	5NO	312.5	1,500
Nottingham	5NG	275.2	200
Plymouth	5PY	400	200
Sheffield	6FL	272.7	200
Stoke-on-Trent	6ST	294	200
Swansea	5SX	294	200
Yugoslavia: Zagreb		275.2	100

EUROPE-ASIA

Russia:			
Armavir	RA47	720	200
Artemovsk	RA56	790	1,200
Astrakhan	RA26	700	1,000
Baku	RA45	750	4,000
Bogorodsk	RA8	750	700
Dneipropetrovsk	RA30	525	1,000
Erivan	RA49	1,050	1,200
Gomel	RA39	925	1,200
Irkutsk	RA57	1,100	500
Ivanovo-Vosnesensk	RA7	800	180
Kharkov	RA43	475, 1,700	4,000
Kiev	RA45	775	1,200
Koursk	RA34	575	1,000
Krasnodar	RA38	513	1,000
Leningrad	RA42	1,000	10,000
Do	RA59	150	350
Minsk	RA18	860	1,200
Moscow	RA1	1,450	40,000
Do	RA2	450	500
Do	RA4	450	300
Nalchik	RA67	1,075	240
Nizhni-Novgorod	RA13	840	1,800

EUROPE-ASIA—Continued

Location	Call signal	Wave length	Power
Russia—Continued.		*Meters*	*Watts*
Novorossisk	RA32	1,117	4,000
Odessa	RA40	975	1,200
Orenburg	RA25	640	1,000
Petropavlovsk	RA64	350	45
Petrozavodsk	RA46	765	2,000
Rostov-on-Don	RA14	820	4,000
Samara	RA22	900	1,200
Saratov	RA32	420	200
Sevastopol	RA9	900	250
Smolensk	RA68	330	20
Do	RA72	150	800
Stalino	RA77	730	1,200
Stavropol	RA20	550	1,200
Sverdlovsk	RA15	1,050	500
Tashkent	RA27	715	2,000
Tiflis	RA11	870	4,000
Tomsk	RA21	300	150
Tver	RA44	690	1,200
Ulyanovsk	RA51	500	20
Vel Ustjuk	RA16	650	1,200
Vladivostok	RA17	480	1,500
Vologda	RA41	875	1,200
Voronezh	RA12	950	240
Turkey: Osmanieh		1,200	6,000

ASIA

Ceylon: Colombo		800	1,500
China:			
Harbin	COHB	445	
Mukden	COMK	425	2,000
Shanghai		342	250
Do		342	250
Do		342	250
Tientsin	XOL	480	500
Do	GEC	280	50
Chosen: Seoul	JODK	357	1,000
Dutch East Indies:			
Bandoeng	ANE	310, 15.93, 31.26	6
Batavia	JFC	220.7	40
Malabar	ANH		
Surabaya		140	500
Do		175	
Hong Kong: Victoria	GOW	300	1,500
India:			
Bombay	2AX	320	50
Do	2FV	387	100
Do	7BY	357.1	3,000
Madras	2GR	400	200
Calcutta	7CA	370.4	3,000
Rangoon	2HZ	350	40
Japan:			
Hirasio	JHBB	37.5	
Hiroshima	JOFK	353	
Kumamoto	JOGK	380	2,000
Nagoya	JOCK	360	1,000
Osaka	JOBK	385	1,000
Taipeh	JFAB	39.5	
Tokyo	JOAK	375	1,000
Kwangtung: Dairen	JQAK	395	5,000
Straits Settlements: Singapore	1SE	330	100

OCEANIA

Australia:			
Adelaide	5CL	392	1,000
Do	5DN	313	100
Bathurst	2MK		
Brisbane	4CM	278	50
Do	4MB	337	250
Do	4QG	385	1,000
Hobart	7ZL	525	3,000
Melbourne	3AR	484	320
Do	3LO	371	1,000
Do	3UZ	319	20
Do	3WR	303	20
Mildura	3EO	286	20

OCEANIA—Continued

Location	Call signal	Wave length	Power
Australia—Continued.		*Meters*	*Watts*
Newcastle	2HD	288	20
Northbridge	2UW	263	100
Perth	6WF	1,250	1,000
Rockhampton	4RN	323	100
Sydney	2BE	326	20
Do	2BL	353	1,000
Do	2FC	442	2,000
Do	2GB	326	1,500
Do	2KY	280	300
Do	2UE	297	50
Do	2WA	462	100
Toowoomba	4GR	294	20
New Zealand:			
Auckland	1YA	420	500
Christchurch	3AC	400	500
Dunedin	4YA	380	110
Palmerston	22F	280	-------
Wellington	2YK	295	60

AFRICA

Algeria:			
Algiers		310	100
Do	8DB	310	100
Canary Islands: Las Palmas	EAR5	250-350	200
Egypt: Cairo	SRE	255	-------
Kenya: Nairobi	7LO	400-35	-------
Morocco:			
Casablanca	CNO	305	25
Do	AIN	51	-------
Rabat		414	-------
Tunisia:			
Carthage	TNU	1,850	-------
Constantine	8KR	42.8	-------
Tunis	TUA	45, 1,450	100
Union of South Africa:			
Cape Town		372	1,200
Durban		398	1,200
Johannesburg	JB	32, 443.5	900
Pretoria		328	-------

INFORMATION CONCERNING TESTING OF PIEZO OSCILLATORS FOR BROADCASTING STATIONS

Prior to the general allocation of broadcast station frequencies required under Federal Radio Commission General Order No. 40, the Bureau of Standards made the following statement:

In case a broadcasting station is now using a piezo oscillator which has been calibrated by the Bureau of Standards and is required to change its frequency by the action of General Order No. 40, the Bureau of Standards will calibrate a piezo oscillator for the new frequency without charge to the station.

In case a broadcasting station is using a piezo oscillator which has not been calibrated by the Bureau of Standards it may be submitted for test and a fee will be charged according to test fee schedule 163.

This arrangement will be terminated March 1, 1929. After that time all tests of piezo oscillators will be charged for according to test fee schedule 163.

The Bureau of Standards now requires from two to five days to complete a test after the apparatus is received. The time required depends on the type of piezo oscillator. Information concerning testing may be obtained by writing the Bureau of Standards, Washington, D. C.

RADIO EQUIPPED AIRPLANE OF THE BUREAU OF STANDARDS

The Department of Commerce assigned to the Bureau of Standards a cabin airplane for use in the development of radio aids to air navigation. This airplane was originally designed to carry four passengers and a pilot. In order to convert it to a flying laboratory two seats were removed and a permanent radio installation made. A set of complete transmitting and receiving equipment having a top which forms a desk was installed in front of the observers' seats. The essential navigation instruments are duplicated on an instrument board above this desk. On this instrument board and on the one in front of

the pilot visual reed indicators for the directive radiobeacon and marker beacons are provided. Two persons may observe the operation of the radio equipment and at the same time be completely informed as to the operation of the airplane without disturbing the pilot. The top of the desk is shock mounted and available for use in testing experimental equipment which it may be desirable to try out in the air.

In order to have satisfactory operation of the receiving and transmitting equipment the entire airplane structure was bonded and the engine ignition system completely shielded. The shielding is so successful that a very sensitive aircraft receiving set may be operated at full sensitivity without interference from the engine ignition. Power for the operation of the transmitting set is obtained from a generator driven by the airplane engine.

This airplane which is in fact a flying radio laboratory is being used in the study of the operation of the radiobeacon system and other uses of radio under conditions of flight.

RECENT PUBLICATIONS OF BUREAU OF STANDARDS ON AIRCRAFT RADIO DEVELOPMENTS

Within the past few months the Bureau of Standards has issued the following publications concerning the work which has been done on the development of radio aids to air navigation. Announcements of these papers were made as they appeared, but it is believed that a complete list will be useful.

Development of Radio Aids to Air Navigation. J. H. Dellinger and H. Pratt. Proceedings Institute of Radio Engineers, **16,** pp. 889–920; July, 1928. (General description of the work which has been done to develop radio aids, particularly the directive beacon system using a visual indicator.)

Bibliography on Aircraft Radio. C. B. Jolliffe and E. M. Zandonini. Proceedings Institute of Radio Engineers, **16,** pp. 985–999; July, 1928. (References to all books and articles having to do with the use of radio in connection with aircraft.)

Apparent Night Variations with Crossed-coil Radiobeacons. H. Pratt. Proceedings Institute of Radio Engineers, **16,** pp. 652–657; May, 1928. (Study of the transmissions from a directive radiobeacon, aural type, located in a mountainous region to determine the errors which may be caused by fading, irregular terrain, etc.)

Receiving Sets for Aircraft Beacon and Telephony. H. Pratt and H. Diamond. Bureau of Standards Journal of Research, **1,** pp. 543–563; October, 1928. Research Paper No. 19. 15 cents. (The necessary features of a receiving set for use on aircraft are discussed and the design details of two satisfactory types developed by the bureau are given.)

Design of Tuned-reed Course Indicators for Aircraft Radiobeacon. F. W. Dunmore. Bureau of Standards Journal of Research, **1,** pp. 751–769; November, 1928. Research Paper No. 28. 5 cents. (This describes the design, construction, and characteristics of several types of tuned-reed indicators for use in connection with the visual radiobeacon system. These indicators operate from an ordinary aircraft receiving set.)

Unidirectional Radiobeacon for Aircraft. E. Z. Stowell. Bureau of Standards Journal of Research, **1,** pp. 1011–1022; December, 1928. Research Paper No. 35. 10 cents. (An antenna arrangement is described for a directive radiobeacon which confines the maximum signal to one direction zone.)

Reprints of the research papers of the Bureau of Standards may be obtained at the prices stated from the Superintendent of Documents, Government Printing Office, Washington, D. C. Reprints of the papers in the Proceedings Institute of Radio Engineers are not available by purchase from the Government. Copies of the Proceedings Institute of Radio Engineers may be obtained from the Institute of Radio Engineers, 33 West Thirty-ninth Street, New York City, for $1 per copy.

A nontechnical description of the work on the development of radio aids to air navigation has been prepared in mimeographed form and a limited number of copies is available for free distribution. Requests for copies of this pamphlet should be addressed to Bureau of Standards, Washington, D. C.

REFERENCES TO CURRENT RADIO LITERATURE

This is a monthly list of references prepared by the radio laboratory of the Bureau of Standards and is intended to cover the more important papers of interest to professional radio engineers which have recently appeared in periodicals,

books, etc. The number at the left of each reference classifies the reference by subject, in accordance with the scheme presented in A Decimal Classification of Radio Subjects—An Extension of the Dewey System, Bureau of Standards Circular No. 138, a copy of which may be obtained for 10 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C. The various articles listed below are not obtainable from the Government. The various periodicals can be consulted at large public libraries.

R100.—*Radio principles*

R113 Radio transmission and the upper atmosphere (editorial). Experimental Wireless and Wireless Engineer (London), **5**, pp. 657–659; December, 1928.

Abstract of a paper by Appleton comparing the three methods for determining the effective height of the Heaviside layer. The frequency change method, the angle of incidence method, and the group retardation method should give the same equivalent height of the ionozed layer.

R113 Bäumler, M. Feldstärkemessungen auf grosse Entfernungen im Rundfunkwellenbereich. (Field strength measurements at great distances in the bradcasting range.) Elektrische-Nachrichten Technik, **5**, pp. 473–477; November, 1928.

Report of cooperative field intensity measurements at Konigsberg, Hamburg, Karlsruhe, and Dresden. All these stations took readings of waves (190, 405, and 585 meters) arriving in the form of long dashes (30 seconds duration) from a sending station located at the Reichspostant at Doeberitz. Day and night effects are reported.

R113 Sreenivasan, K. Über die Wellenausbreitung in einem dispergierenden Medium. (On the wave propagation in a dispersed medium.) Zeits. für Hochfrequenztechnik, **32**, pp. 121–124; October, 1928.

It is shown that the group velocity of high-frequency waves varies for different frequencies when passing through a dispersed medium such as the Heaviside layer. It seems to be, therefore, evident that a modulated wave on account of its two side bands should produce distortion after passing through this ionized layer.

R113 Fuchs, J. Der Einfluss der Erdatmosphäre auf die Ausbreitung kurzer Wellen. (On the influence of earth atmosphere on the propagation of short waves.) Zeits. für Hochfrequenztechnik, **32**, pp. 125–129; October, 1928.

It is shown that the strength of the received signal for short waves after passing over sea water depends on the distribution of the pressure of the atmosphere. From this it follows that the atmosphere produces scattering similar to diffused reflection.

R113.5 Goldstein, S. The influence of the earth's magnetic field on electric transmission in the upper atmosphere. Proc. Royal Soc. (London), **121A**, pp. 260–285; November, 1928.

Based on lectures by Prof. J. Larmor. The theory of the effect of the magnetic field of the earth on the propagation of electromagnetic waves in the Heaviside layer is given in much detail.

R114 Schindelhauer, F. Über elektromagnetische Störungen. (On electromagnetic disturbances). Elektrische-Nachrichten Technik, **5**, pp. 442–449; November, 1928.

Study of the clicks and grinders by means of the direction finder due to Watson-Watt. The author concludes that since the direction of the maximal disturbance is either along or perpendicular to the earth's magnetic axis, most of the atmospherics are due to field changes above the surface of the earth. These field changes cause the electron to be drawn from the sun towards the earth and then produce the eddies of the Heaviside layer. The first causes the clicks and the latter the grinders.

R114 Watson-Watt, R. A. Present status of knowledge of atmospherics. Experimental Wireless and Wireless Engineering (London), **5**, pp. 629–652; November, 1928.

Reviews work done on this subject by himself and others up to present date.

R120 Moser, W. Die Übertragung der Energie vom Sender zur Antenne bei kurzen Wellen. (The transfer of energy of short waves from the transmitting set to the antenna.) Elektrische-Nachrichten Technik, **5**, pp. 422–426; November, 1928.

Description of the system carrying the high frequency power to various individual antennas used for beam transmission. The parallel wire and the concentric tube system is used for feeding the power into the antennas and a method is described by means of which the losses of the distributors can be found.

R125.6 Meissner, A. and Rother, H. Über die Bestimmung des günstigsten Ausstrahlwinkels bei horizontalen Antennen. (On the determination of the favorable radiation angle in horizontal antennas.) Zeits. f. Hochfrequenztechnik, **32**, pp. 113–115; October, 1928.

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

R125.6 Gresky, G. Die Wirkungsweise von Reflektoren bei kurzen elektrischen Wellen. (The operation of reflectors for short electric waves.) Zeits. für Hochfrequenztechnik, **32**, pp. 149–162; November, 1928.

The beam effect of a vertical antenna for the case of a cylindrical parabolic reflector and a plane reflector (several vertical wires along a straight wire) is experimentally studied. For the parabolic reflector the ratio of focal length to wave length should be 0.27 and for the plane reflector 0.2. The tuned reflectors give smaller dimensions.

R125.6 Böhm, O. Die Bündelung der Energie kurzer Wellen. (The concentration of the energy of short waves.) Elektrische-Nachrichten Technik, **5**, pp. 413–421; November, 1928.

Explains the beam transmission system employed by the Telefunken Co. A very clear presentation of the underlying principles giving at first the radiation characteristic of the dipole, then that of a group of dipoles along a straight line and in a plane.

R125.6 Gothe, A. Über Drahtreflektoren. (On wire reflectors.) Elektrische-Nachrichten Technik, **5,** pp. 427–430; November, 1928.

Description of the action of reflector antennas. Wire reflectors reduce the strength of the backward beam considerably. Complete screening by means of reflectors is only possible if the radiation coupling between antenna and reflector is variable so that the amplitude and the phase of the reflector current can be properly adjusted.

R130 Podliasky. Equilibres instables et regimes statiques parasites dans les circuits electriques associes aux triodes. (Unstable equilibrium and regular static parasites in electric circuits associated with tubes.) L'Onde Electrique, **7,** pp. 475–487; November, 1928.

Conclusion of the paper on pp. 287–306 of the July, 1928, issue of this periodical.

R131 Rajski, C. Les capacities internes de la lampe a plusieurs electrodes. (Interelectrode capacities of multi-electrode tubes.) L'Onde Electrique, **7,** pp. 461–474; November, 1928.

Expressions are derived for the interelectrode capacities of electron tubes taking the space charge into consideration. If the tube is not burning, the usual interelectrode capacities (filament-grid, filament-plate, and grid-plate) are observed but when the filament is emitting electrons it is necessary to consider four capacities, the grid capacity, the plate capacity, the grid-plate capacity, and the plate-grid capacity.

R134.75 Boella, M. Sur le calcul des amplificateurs a moyenne frequence pour superheterodyne. (On the calculation of the intermediate frequency amplifier stages of a superheterodyne.) L'Onde Electrique, **7,** pp. 500–508; November, 1928.

Analytical treatment of the amplifier stages of a superheterodyne used for the amplification of the intermediate frequency.

R134.75 Ramsay, J. F. A double superheterodyne. Experimental Wireless and Wireless Engineer (London), **5,** pp. 669–672; December, 1928.

Description of a twofold superheterodyne. The first superheterodyne changes the received high frequency to a 600 kilocycle current which is then amplified by two stages of radio-frequency amplification after which another heterodyne produces a 150 kilocycle current. This is passed through three stages of radio-frequency amplification rectified and amplified by a two stage audio-frequency amplifier.

R144 Waite, G. R., Brickwedde, F. G., Hall, E. L. Electrical resistance and magnetic permeability of iron wire at radio-frequencies. Physical Review, **32,** pp. 967–73; December, 1928.

Discussion of the results of B. Wwednensky and K. Theodortschik and those of the authors of this paper who could not detect a critical variation in the resistance of iron wire in the vicinity of 3,000 kilocycles.

R144 Jackson, W. The effect of frequency on the value of high resistances of the grid-leak type. Experimental Wireless and Wireless Engineer (London), **5,** pp. 677–679; December, 1928.

The very high resistance of a grid-leak consists in reality of a pure resistance with a small capacity (a few/$\mu\mu$fds) in parallel. It is shown that above 10° cycles/sec. the effective resistance changes and the parasitic capacity current becomes pronounced.

R200.—*Radio measurements and standardization*

R250 Moullin, E. B. An ampere meter for measuring alternating currents of very high frequency. Proc. Royal Soc. (London), **121A,** pp. 41–71; November, 1928.

Gives the theory and construction of a new high-frequency ammeter which is based on the repulsion between two parallel conductors carrying the current to be measured. The frequency effect can be calculated. One conductor is fixed and the other one can move against a small elastic constant. This motion is a measure of the repulsion force and therefore of the current. It is noted by means of a microscope.

R261 Aiken, C. B. A sensitive vacuum tube voltmeter. Jnl. Optical Soc. of American and Review of Sci. Instruments, **17,** pp. 440–450; December, 1928.

A vacuum tube voltmeter is described which utilizes the heterodyne principle for obtaining increased sensitivity.

R300.—*Radio apparatus and equipment*

R342.15 Koehler, G. The design of transformers for audio-frequency amplifiers with preassigned characteristics. Proc. Institute of Radio Engrs., **16,** pp. 1742–1770; December, 1928.

Requirements of ideal transformer are stated and difficulties encountered in attempting to build transformers for interstage coupling units which will meet these requirements are pointed out.

R343 Küpfmüller, K. Über die Dynamik der selbsttätigen Verstärkungsregler. (On the dynamics of the automatic amplifier stabilizers.) Elektrische-Nachrichten Technik, **5,** pp. 459–467; November, 1928.

A system is described by means of which the amplified intensity is automatically kept constant. Based on the principle developed a receiving set has been built which produces the same output intensities during times at which the input voltage (due to fading) varies up and down.

R344 Eller, K. B. On the variation of generated frequency of a triode oscillator due to changes in filament, current, grid voltage, plate voltage, or external resistance. Proc. Institute of Radio Engrs., **16,** pp. 1706–1728; December, 1928.

General expressions developed for generated frequency of grid-tuned and plate-tuned generators.

R344.4 Ritz, M. Essais sur ondes tres courtes. (Tests on very short waves.) L'Onde Electrique, **7,** pp. 488–499; November, 1928.

Study of transmission of waves of 2 to 8 meters length. Gives generator diagrams. The experimental results agree with those due to R. Mesny.

R344.4 Über eine Methode zur Erzeugung von sehr kurzen elektromagentischen Wellen. (On a method for the production of short electromagnetic waves.) Zeits. für Hochfrequenztechnik, **32,** p. 172; November, 1928.

Description of magnetron oscillator for the production of very short waves, $\lambda = 29$ cm.

R359 Hahnemann, W. Über die neuere Entwicklung des Maschinensenders für kleine Wellenlangen. (On the new development of machine transmitters for short wave lengths.) Elektrische-Nachrichten Technik, **5,** pp. 431–437; November, 1928.

Description of the latest development of the Lorentz alternators with frequency multiplication. The improvements consist in producing frequencies in the broadcast band; filters for reducing the effect of the side bands; increase of the life of the frequency multipliers and reduction of the Thriller effect which causes a periodic change in the frequency.

R376.3 Wolff, I. Sound measurements and loud speaker characteristics. Proc. Institute of Radio Engrs., **16,** pp. 1729–41; December, 1928.

Description given of methods used to measure loud-speaker response. Typical characteristic curves given.

R400.—*Radio communication systems.*

R412 Bailey, A.; Dean, S. W.; Wintringham, W. T. The receiving system for long-wave transatlantic radiotelephony. Proc. Institute of Radio Engrs., **16,** pp. 1645–1705; December, 1928.

Determinations show that frequencies near 60 kilocycles are best suited for transatlantic radiotelephone transmission. Various types of antennas described. Mathematical discussions of wave antenna, antenna arrays, and probability of simultaneous occurrence of telegraph interference are given in appendices.

R500.—*Applications of radio*

R526.1 Stowell, E. Z. Unidirectional radiobeacon for aircraft. Bureau of Standards Journal of Research, December, 1928. Research Paper No. 35. Reprintcopies obtainable for 10 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C.

Description of one of the schemes tried out by the Bureau of Standards for unidirectional radiobeacon work. Directive and nondirective fields are transmitted simultaneously with the proper phase and amplitude relations in order to obtain unidirectional effects.

R570 Birnbaum, H. W. Die Fernlenkversuche der Reichsmarine in den Jahren 1916/1918. (The guid ing experiments of the German Marine in the years 1916 to 1918.) Zeits. für Hochfrequenztechnik, **32,** pp. 162–170; November, 1928.

A description of the system used for guiding airplanes by means of radio.

R592 Crawley, C. A year's progress in commercial wireless. Wireless World and Radio Review, **23,** pp. 801–804; December 12, 1928.

Discusses automatic S. O. S., position finding, less jamming of broadcast, beam telephony.

R800.—*Nonradio subjects*

534 Ballantine, S. Note on the effect of reflection by the microphone in sound measurements. Proc. Institute of Radio Engrs., **16,** pp. 1639–1644; December, 1928. Physical Review, **32,** pp. 988–992; December, 1928.

Attention is called to the fact that ordinary microphones will not indicate the true pressure of an undisturbed sound wave for the entire audio-frequency band. The correction can, however, be found by employing a standard spherical mounting of which the diagram occupies a small area at the pole. A method of this type can, therefore, be used instead of obtaining the calibration curve with the Raleigh disk.

534.3 Watanabe, Y. Über die vermittels einer Stimmgabel erregten Rohrenoszillatoren. (On tuning fork vacuum tube oscillators.) Zeits. für Hochfrequenztechnik, **32,** pp. 116–121; October, 1928.

The equations for these oscillators are derived and the mechanical as well as electrical oscillations are compared in order to give an expression for the frequency obtained in terms of the true frequency of the tuning fork.

535.3 Barnard, G. P. The selenium cell: Its properties and applications. Jnl. Institution Elec. Engrs. (London), **67,** pp. 97–120; December, 1928.

Gives the historical review on the work done with the selenium cell and describes the several factors affecting the conductance. Gives applications to photometric and relay problems and shows applications to the optophone, photophone, talking film, and television. An extended list of references is given at the end of this paper.

537.55 Pardue, L. A., Webb, J. S. Ionic oscillations in the glow discharge. Physical Review, **32,** pp. 946–49; December, 1928.

A detailed experimental study of ionic oscillations in the glow discharge which was originally found by Widdington and Appleton.

537.65 Tawill, E. P. Nouveau mode de developpement d'electricite par torsion dans les cristaux de quartz. (New method of production of electricity by torsion on quartz crystals.) Comptes Rendus, **187,** pp. 1042–1044; December 3, 1928.

A way was found of producing charges on a quartz cylinder axis along the optical axis when applying a torsion about this axis. Suggests calling it strepho-electricity, because it is different from ordinary piezo-electricity. Shows that for a twist in one direction charges of opposite polarity appear on the surface of the envelope of the cylinder and the faces perpendicular to the axis. A twist in the opposite direction reverses the polarity. The polarity also depends on the optical rotation.)

537.65 Mandell, W. The determination of the piezo-electric moduli of ammonium Seignette salt. Proc. Royal Soc. (London), **121A,** pp. 130–140; November, 1928.

Theory and determination of the piezo-electric constants of ammonium Seignette salt.

621.374.2 Landon, V. D. A bridge circuit for measuring the inductance of coils while passing direct current Proc. Institute of Radio Engrs., **16,** pp. 1771–1775; December, 1928.

Bridge circuit described in which inductance of coil is compared to resistances and a capacitance.

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