

DEPARTMENT OF COMMERCE

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY RADIO DIVISION

Washington, April 30, 1927—No. 121

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ABBREVIATIONS

The necessary corrections to the List of 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. O=west longitude. N=north latitude. S=south latitude.
Call	= Call letters assigned.
System	= Radio system used and sparks per second.
Range	= Normal range in nautical miles.
W. l.	= Wave lengths assigned: Normal wave lengths in italics.
Service	= Nature of service maintained: FX=Point-to-point (fixed service): PG=General public. PR=Limited public. RC=Radiocompass. AB=Aviation beacon. B=Beacon. P=Private. O=Government business exclusively.
Hours	= Hours of operation: N=Continuous service. X=No regular hours.
F. T. Co.	= Federal Telegraph Co.
I. R. T. Co.	= Intercity Radio Telegraph Co.
I. W. T. Co.	= Independent Wireless Telegraph Co.
K. & C.	= Kilbourn & Clark Manufacturing Co.
R. C. A.	= Radio Corporation of America.
T. R. T. Co.	= Tropical Radio Telegraph Co.
U. R. Corp.	= Universal Radio Corp.

W. S. A. Co. = Wireless Specialty Apparatus Co.
 C. w. = Continuous wave.
 I. c. w. = Interrupted continuous wave.
 Kc. = Kilocycles.
 Fy. = Frequency.
 A. c. = Alternating current.
 Y. t. = Vacuum tube.
 U. S. L. = Applies only to the list of Commercial and Government Radio Stations of the United States.

NEW STATIONS

Commercial land stations, alphabetically, by names of stations

[Additions to the List of Radio Stations of the United States, edition of June 30, 1926, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Station	Call signal	Wave lengths	Service	Hours	Station controlled by—
Alpena, Mich. ¹	WGI	96.3, 715, 575, 1,575.	PG	N	Alpena Marine Radio Service.
Baltimore, Md. ²	WMHI	600, 715, 2250	PG	N	R. C. A.
Buffalo, N. Y. ³	WBL	715, 575, 500, 1,575, 1,674, 2,100, 2,400.	PG	N	Do.
Caramoan, P. I. (Camarines Sur) ⁴	KZMN	600, 950, 1,175.....	PG		Philippine insular government.
Stomboat Bay, Alaska (Noyes Island) ⁵	KUU	600, 725.....	P	X	New England Fish Co.
Taku Harbor, Alaska ⁶	KVG	600, 705, 900.....	P	X	Libby, McNeil & Libby.

¹ Loc. (approximately) O 57° 50' 00", N 45° 05' 00"; range, 200; system, composite, v. t. telegraph; rates, 10 cents (52 centimes) per word.

² Loc. (approximately) O 76° 37' 00", N 39° 17' 00"; range, 200; system, R. C. A., v. t. telegraph; rates, 10 cents (52 centimes) per word.

³ Range, 500; system, R. C. A., v. t. telegraph; rates, 10 cents (52 centimes) per word.

⁴ Loc. O 125° 31' 30", N 12° 46' 00"; range, 500; system, Kilbourne & Clark, 1,000; hours, 8 a. m.-12 noon, 2-4.30 p. m. week days; 9-11 a. m. Sundays and holidays; ship service first 10 minutes of each hour; rates, 6 cents per word.

⁵ Loc. (approximately) O 133° 45' 00", N 53° 30' 00"; range, 200.

⁶ Loc. (approximately) O 129° 50' 00", N 58° 00' 00".

Commercial ship stations, alphabetically, by names of vessels

[Additions to the List of Radio Stations of the United States, edition of June 30, 1926, and to the International List of Radiotelegraph Stations published by the Berne bureau]

Name of vessel	Call signal	Rates	Service	Hours	Owner of vessel	Station controlled by—
Amasa Stone (RC) ¹	WPBC		PG	X	Interlake S. S. Co.....	R. C. A.
Anniston.....	KIDM	8	PG	X	U. S. S. B.....	
Charles M. Schwab (RC) ¹	WPBD		PG	X	Interlake S. S. Co.....	Do.
City of Nome.....	WMBZ	8	PG	X	G. M. Bartlett.....	
Cressida.....	WNBD				Berman Oelrichs.....	
Colonel James Pickands (RC) ¹	WPBE		PG	X	Interlake S. S. Co.....	
Coquina.....	WVAA	8	PG	X	Pillsbury & Curtis.....	Do.
Craigmore.....	WXOO	8	PG	X	Morton Salt Co.....	
Dawn Star.....	WMBF				John J. Morgan.....	
Ethel.....	WNBE				Carl Isakson.....	
Harry Coulby ¹	WPBF		PG	X	Interlake S. S. Co.....	Do.
H. J. Lawrence.....	KZOA	8	PG	X	Lawrence S. S. Co.....	
Kishacoquillas.....	KIPJ	8	PG	X	Steamer Kishacoquillas Corporation.....	I. W. T. Co.
Milwaukee Bridge.....	KIBF	8	PG	X	Mulson Navigation Co.....	
M. & J. Tracy.....	WMBV	8	PG	X	M. & J. Tracy.....	
Samuel Mather (RC) ¹	WPBG		PG	X	Interlake S. S. Co.....	R. C. A.
Skyhawk III.....	WMBT				George H. Phelps.....	
S. S. Therpe.....	WNBG				Upper Mississippi Barge Line Co.....	
Venture.....	WNBW				Allen B. Hoffman.....	
Venus ¹	WPBI		PG	X	Interlake S. S. Co.....	Do.
Youngstown (RC) ¹	WPBH		PG	X	Orier Hill S. S. Co.....	

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Commercial land and ship stations, alphabetically, by call signals

[b, ship station; c, land station]

Call signal	Name of station	Call signal	Name of station
KIBF	Milwaukee Bridge..... b	WNBD	Cressida..... b
KIDM	Anniston..... b	WNBE	Ethel..... b
KIFI	Kishacoqui'Isd..... b	WNBG	S. S. Thorpe..... b
KUU	Steamboat Bay, Alaska (Noyes Island)..... c	WNBM	Venture..... b
KVC	Taku Harbor, Alaska..... c	WPBC	Amasa Stone..... b
KZMN	Carrman, P. I. (Camarines Island)..... c	WPBD	Charles M. Schwab..... b
KZOA	H. J. Lawrence..... b	WPBE	Colonel James Pickands..... b
WBL	Buffalo, N. Y..... c	WPBF	Harry Condy..... b
WGI	Albany, Mich..... c	WPBG	Samuel Mather..... b
WMBP	Dawn Star..... b	WPBH	Youngstown..... b
WMBT	Skytark III..... b	WPBI	Venus..... b
WMBV	Lakeland..... b	WVAA	Coqu'Is..... b
WMBZ	City of Nome..... b	WXOO	Craigsmere..... b
WMIH	Baltimore, Md..... c		

Commercial airplane stations, alphabetically, by names of stations

[Additions to the List of Radio Stations of the United States, edition of June 30, 1925, and to the International List of Radiotelegraph Stations published by the Home Bureau]

Station	Call signal	Wave length	Service	Hours	Station controlled by—
America ¹	WTW	600	F	X	America-Trans-Oceanic Co.
Columbia ²	WBJ	600, 900	F	X	Pioneer Instrument Co.

¹ Range, 400-1,000; system, U. S. Navy v. t. telegraph.

² System, composite v. t. telegraph.

NOTE.—These planes are to be used for the New York to Paris flight.

Commercial airplane stations, alphabetically, by call signals

[b, ship station; c, land station]

Call signal	Name of station	Call signal	Name of station
WBJ	Columbia.	WTW	America.

Broadcasting stations, alphabetically by names of States and cities

[Additions to the List of Radio Stations of the United States, edition of June 30, 1925]

State and city	Call signal	State and city	Call signal
Indiana Terre Haute.....	WRPI	Kansas Lawrence.....	WREN

Broadcasting stations, alphabetically, by call signals

Call signal	Location of station (address)	Owner of station	Power (watts)	Wave length	Frequency (kilocycles)
WREN	Lawrence, Kans.....	Jenny Wren Co.....	750	275.1	1,000
WRPI	Terre Haute, Ind.....	Ross Polytechnic Institute.....	100	217.2	1,360

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Government land stations, alphabetically, by names of stations

[Additions to the List of Radio Stations of the United States, edition of June 30, 1926, and to the International List of Radiotelegraph Stations published by the Bureau]

Station	Call signal	Wave length	Service	Hours	Station controlled by—
Bowman Field, Ky. (Louisville) ¹	WYW	1,409.....	O	N	Signal Corps, U. S. Army.

¹ Loc. (approximately) O 85° 45' 00", N 35° 16' 00"; range, 200; system, U. S. Signal Corps v. t. telegraph.

Government ship stations, alphabetically, by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1926, and to the International List of Radiotelegraph Stations published by the Bureau]

Station	Call signal	Wave length	Service	Hours	Station controlled by—
Elise.....	NIZM	.....	O	X	Coast and Geodetic Survey.
Helianthus.....	NIZN	.....	O	X	Do.
Marindin.....	NIZP	.....	O	X	Do.
Mikawa.....	NIZQ	.....	O	X	Do.
Mitchell.....	NIZR	.....	O	X	Do.
Ogden.....	NIZS	.....	O	X	Do.
Rodgers.....	NIZT	.....	O	X	Do.
Scandinavia.....	NIZV	.....	O	X	Do.
Seal ¹	WWFA	130, 600.....	O	X	Alaskan Game Commission.

¹ Range, 25; system, composite, v. t. telegraph.

Government land and ship stations, alphabetically, by call signals

[b, Ship station; c, land station]

Call signal	Name of station	Call signal	Name of Station
NIZM	Elise..... b	NIZS	Ogden..... b
NIZN	Helianthus..... b	NIZT	Rodgers..... b
NIZP	Marindin..... b	NIZV	Scandinavia..... b
NIZQ	Mikawa..... b	WWFA	Seal..... b
NIZR	Mitchell..... b	WYW	Bowman Field, Ky. (Louisville)..... c

Special land stations, alphabetically, by names of stations

[Additions to the List of Radio Stations of the United States, edition of June 30, 1926]

Station	Call signal	Station controlled by—
Bound Brook, N. J.....	3XL	R. C. A.

Special land stations, grouped by districts

Call signal	District and station	Call signal	District and station
3XL	Third district Bound Brook, N. J.		

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ALTERATIONS AND CORRECTIONS

COMMERCIAL LAND STATIONS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1926, and to the International List of Radiotelegraph Stations, published by the Berne Bureau]

BALTIMORE, MD. (WMH) (City of Baltimore, Bureau of Harbors).—Strike out all particulars—replaced by station operated by R. C. A.

COMMERCIAL SHIP STATIONS, ALPHABETICALLY, BY NAMES OF VESSELS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1926, and to the International List of Radiotelegraph Stations, published by the Berne Bureau]

AMERICAN STAR.—Owner of vessel, Charles Nelson Co.

ARCADIA.—Station controlled by F. T. Co.

BERT E. HANEY.—Name changed to M. F. Sterling; owner of vessel, Sterling S. S. Corporation.

CAROLINAS.—Station controlled by I. W. T. Co.

CASTANA.—Owner of vessel, Steamer Castana Corporation.

COMMERCIAL PIONEER.—Owner of vessel, Commercial Pioneer S. S. Co.

CORRALES.—Station controlled by R. C. A.

DARTFORD.—Owner of vessel, John J. Roen.

ELDORADO.—Station controlled by F. T. Co.

JANE NETTLETON.—Station controlled by F. T. Co.

LAKE GILTEDGE.—Owner of vessel, Lake Giltedge S. S. Co.

MALOLO.—Owner of vessel, Malston Co.

MONTICELLO.—Name changed to Oregon; owner of vessel, Oregon S. S. Corporation.

WEST KEENE.—Station controlled by I. W. T. Co.

Strike out all particulars of the following-named vessels: Brunswick, Juvigny.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY, BY CALL SIGNALS

KDCJ, read M. F. Sterling; WLJ, read Oregon; strike out all particulars following the call signals, KUQX, WNIO.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1926, and to the International List of Radiotelegraph Stations, published by the Berne Bureau]

CAMP CUSTER, MICH.—Loc. (approximately) O 85° 10' 00", N 42° 19' 00"; range, 250; system, U. S. Army v. t. telegraph; w. l., 1,090; service, FX.

CAMP McCLELLAN, ALA.—Loc. O 84° 58' 02", N 32° 21' 44"; range, 350; system, U. S. Army v. t. telegraph; w. l., 141.4; service, FX.

FORT BENNING, GA.—Loc. O 85° 47' 33", N 33° 42' 56"; range, 200; system, U. S. Army v. t. telegraph; w. l., 673.8; service, FX.

FORT BRADY, MICH.—Loc. (approximately) O 84° 21' 00", N 46° 34' 00"; range, 300; system, U. S. Army v. t. telegraph; w. l., 1,199; service, FX.

FORT OGLETHORPE, GA.—Loc. O 85° 15' 25", N 34° 56' 20"; range, 125; system, U. S. Army v. t. telegraph; w. l., 826; service, FX.

FORT SHERIDAN, ILL.—System, U. S. Army v. t. telegraph; w. l., 1,090; service, FX.

FORT THOMAS, KY.—Loc. (approximately) O 84° 25' 00", N 39° 04' 00"; range, 300; system, U. S. Army v. t. telegraph; w. l., 1,090; service, FX.

FORT WAYNE, MICH.—Loc. (approximately) O 83° 03' 00", N 42° 20' 00"; range, 300; system, U. S. Army v. t. telegraph; w. l., 1,304; service, FX.

HOG ISLAND, VA.—Strike out all particulars.

NORTH HEAD, WASH.—Changed to Astoria, Oreg.; loc. O 123° 50' 51", N 46° 11' 05"; w. l., 600, 2,100, 2,677, 4,997; other particulars unchanged.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1926, and to the International List of Radiotelegraph Stations, published by the Berne Bureau]

ALPHABETICALLY BY CALL SIGNALS

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GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS

NDV, strike out all particulars; NKE, changed to NKO; NPE, read, Astoria, Oreg.

BROADCASTING STATIONS, BY CALL SIGNALS

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of June 30, 1926]

WCAR (San Antonio, Tex.).—Call signal changed to KTSA.

WCCO (St. Paul—Minneapolis, Minn.).—This station also uses call signal WGMS when operating through station WLB, University of Minnesota.

Strike out all particulars of the following-named stations: KFFP (Moberly, Mo.); KFOB (Burlingame, Calif.); KFOT (Wichita, Kans.); KGEL (Jamestown, N. Dak.); KMJP (Kansas City, Mo.); WABX (Mount Clemens, Mich., near); WEAU (Sioux City, Iowa); WAOK (Ozone Park, N. Y.); WFAV (Lincoln, Nebr.). For further changes see list of stations issued temporary permits.

MISCELLANEOUS

List of broadcasting stations issued temporary permits

The following broadcasting stations, listed alphabetically by call letters, have been issued temporary permits by the Federal Radio Commission to operate, pending final action on their applications for licenses, with the power and on the frequency indicated. This list, which is up to May 3, 1927, supersedes list in Radio Service Bulletin, No. 117, December 31, 1926.

Call letters	Location of station	Owner	Power	Pre- quency	Wave length
			Watts	Kilo- cycles	Meters
KDEA	East Pittsburgh, Pa.	Westinghouse Electric & Manufacturing Co.	50,000	970	307.1
KDLR	Devils Lake, N. Dak.	Radio Electric Co.	15	1,300	230.6
KDYL	Salt Lake City, Utah	Intermountain Broadcasting Co.	100	1,220	245.8
KELW	Burbank, Calif.	Earl L. White	250	560	535.4
KEX	Portland, Oreg.	Western Broadcasting Co.	5,000	1,240	241.8
KFAB	Lincoln, Nebr.	Nebraska Buick Auto Co.	2,000	880	340.7
KFAD	Phoenix, Ariz.	Electrical Equipment Co.	500	1,100	272.6
KFAU	Boise, Idaho	Independent school district of Boise	5,000	1,070	280.2
KFBB	Havre, Mont.	F. A. Buttrey & Co.	50	1,000	275.1
KFBC	San Diego, Calif.	W. K. Azbill and Dr. Arthur W. Yale	100	1,050	277.6
KFBK	Sacramento, Calif.	Kimball Upson Co.	100	500	594.4
KFBL	Everett, Wash.	Lesse Brothers	100	1,540	195.7
KFBH	Trinidad, Colo.	Trinidad High School	15	1,200	250
KFCB	Laramie, Wyo.	Bishop N. S. Thomas	1,000	800	374.8
KFCR	Phoenix, Ariz.	Nelson Radio Supply Co.	125	1,200	250
KFCR	Santa Barbara, Calif.	Santa Barbara Broadcasting Co.	100	720	415.4
KFDM	Braunton, Tex.	Magnolia Petroleum Co.	500	950	315.0
KFDX	Shreveport, La.	First Baptist Church	500	1,270	235.1
KFDY	Brookings, S. Dak.	South Dakota State College	500	1,000	299.8
KFDZ	Minneapolis, Minn.	Harry O. Iverson	10	1,300	220.6
KFEC	Portland, Oreg.	Mrier & Frank Co.	50	1,190	252
KFEL	Denver, Colo.	Eugene P. O'Fallon (Inc.)	1,000	1,180	254.1
KFRQ	Oak, Nebr.	Scruggin & Co. Bank	1,500	1,120	267.7
KFRY	Kellogg, Idaho	Bunker Hill & Sullivan	10	1,290	231.4
KFGQ	Boone, Iowa	Boone Biblical College	10	1,000	299.8
KFH	Wichita, Kans.	Hotel Lussen	500	1,120	267.7
KFHA	Gunnison, Colo.	Western State College	50	1,180	252
KFHL	Oskaloosa, Iowa	Peter College	10	1,250	239.9
KFI	Los Angeles, Calif.	Earle C. Anthony	5,000	640	468.5
KFIF	Portland, Oreg.	Benson Polytechnic Institute	100	1,210	247.8
KFIO	Spokane, Wash.	North Central High School	100	1,100	272.6
KFIQ	Yakima, Wash.	J. M. Miller	100	1,170	256.3
KFIU	Juneau, Alaska	Alaska Electric Light & Power Co.	10	1,240	225.4
KFIZ	Fond du Lac, Wis.	Fond du Lac Commonwealth	100	1,100	272.6
KFJB	Marshalltown, Iowa	Marshalltown Electric Co.	15	1,210	247.8
KFFF	Oklahoma, Okla.	National Radio Manufacturing Co.	1,000	1,120	267.7
KFJI	Astoria, Oreg.	E. E. Mearsh	15	1,220	245.8
KFJM	Grand Forks, N. Dak.	University of North Dakota	100	1,080	277.6
KFJR	Portland, Oreg.	Ashley C. Dixon & Son	100	1,140	263
KFJY	Fert Dodge, Iowa	Tunwall Radio Co.	700	1,230	243.8
KFJZ	Fert Worth, Tex.	W. K. Branch	50	1,180	254.1
KFKA	Greeley, Colo.	Colorado State Teachers	100	1,100	272.6

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List of broadcasting stations issued temporary permits—Continued

Call letters	Location of station	Owner	Power	Fre- quency	Wave length
			Watts	Kilo- cycles	Meters
KPKX	Hastings, Nebr.	Westinghouse Electric & Manufacturing Co.	23,000	1,040	288.3
KPKZ	Kirkville, Mo.	State Teachers' College	15	1,320	225.4
KFLR	Albuquerque, N. Mex.	University of New Mexico	100	1,150	259.1
KFLU	San Benito, Tex.	San Benito Radio Club	15	1,270	230.1
KFLV	Rockford, Ill.	Swedish Evangelical Church	100	1,310	225.9
KFLX	Galveston, Tex.	George Roy Clough	250	1,250	239.7
KFMR	Sioux City, Iowa	Morningside College	100	1,150	260.0
KFMX	Northfield, Minn.	Carlton College	500	890	333.9
KFNF	Shenandoah, Iowa	Henry Field Seed Co.	1,000	650	461.3
KFOA	Seattle, Wash.	Rhodes Department Store	1,000	660	454.3
KFON	Long Beach, Calif.	Nichols & Wartner	500	1,200	250.0
KFOR	Lincoln, Nebr.	Lincoln Hatchery	100	1,330	225.4
KFOX	Omaha, Nebr.	Technical High School	100	1,210	247.8
KFOY	St. Paul, Minn.	Maurice Gordon Goldberg	250	1,190	252
KFPI	Dublin, Tex.	C. C. Baxter	15	1,100	272.7
KFPM	Greenville, Tex.	New Furniture Co.	18	1,270	238.1
KFPB	Los Angeles, Calif.	Los Angeles County Forestry Department	500	1,200	250.0
KFPW	Cartersville, Mo.	Lannie W. Stewart	50	1,160	258.5
KFPY	Spokane, Wash.	Synona Investment Co.	250	1,100	272.6
KFQA	St. Louis, Mo.	The Principia	100	1,150	260.7
KFQB	Fort Worth, Tex.	Lone Star Broadcast Co.	1,000	590	508.2
KFQU	Holy City, Calif.	W. R. Ritter	100	1,300	230.8
KFQW	Seattle, Wash.	C. F. Krierlin	100	1,590	216.7
KFRC	San Francisco, Calif.	Don Lee (Inc.)	50	760	390.8
KFRU	Columbia, Mo.	Stephens College	500	600	499.7
KFSB	San Diego, Calif.	Airfan Radio Corporation	1,000	1,220	245.8
KFSO	Los Angeles, Calif.	Echo Park Evangelical Association	500	1,000	275.1
KFUL	Galveston, Tex.	T. Goggin & Bros. Music Co.	750	1,160	258.5
KFUM	Colorado Springs, Colo.	W. D. Carley	100	1,230	239.9
KFUO	St. Louis, Mo.	Concordia Seminary	500	650	465.1
KFUP	Denver, Colo.	Fitzsimons General Hospital	100	1,280	234.2
KFUR	Ogden, Utah	Peery Building Co. (Inc.)	50	1,340	223.7
KFUS	Oakland, Calif.	Dr. L. L. Sherman	50	1,170	256.3
KFUT	Salt Lake City, Utah	University of Utah	50	1,140	262.0
KFVD	San Pedro, Calif.	W. J. & C. I. McWhinnie	250	1,400	205.4
KFVE	St. Louis, Mo.	Denson Broadcasting Co.	1,000	1,250	239.9
KFVG	Independence, Kans.	First Methodist Episcopal Church	50	1,270	235.1
KFVI	Houston, Tex.	Headquarters Troop Fifty-sixth Cavalry	50	1,250	239.9
KFVR	Denver, Colo.	The Olinger Corporation Broadcasting	250	1,230	243.8
KFVS	Cape Girardeau, Mo.	Hirsch Battery & Radio Co.	50	1,340	223.7
KFWB	Los Angeles, Calif.	Warner Bros. Pictures	750	1,190	252
KFWC	San Bernardino, Calif.	L. E. Wall	200	1,080	277.6
KFWF	St. Louis, Mo.	St. Louis Truth Center	250	1,401	214.2
KFWH	Eureka, Calif.	F. Wellington Morse, Jr.	100	1,180	254.1
KFWI	San Francisco, Calif.	Radio Entertainments (Inc.)	500	1,200	249.0
KPWM	Oakland, Calif.	Oakland Educational Society	1,000	1,400	214.2
KFWO	Avalon, Calif.	Lawrence Mott	250	1,420	211.1
KFWV	Portland, Oreg.	KFWV Broadcast Studios (Inc.)	50	1,410	212.6
KFXB	Los Angeles, Calif.	Bertram O. Heller	500	1,350	222.1
KFXF	Denver, Colo.	Pikes Peak Broadcasting Co.	500	710	422.3
KFXH	El Paso, Tex.	Bledsoe Radio Co.	100	1,240	241.8
KFXJ	Edgewater, Colo. (near)	R. O. Howell	15	1,390	215.7
KFYF	Oxnard, Calif.	Carl's Radio Den	25	1,400	214.2
KFYR	Bismark, N. Dak.	Honkins Meyer	250	1,210	247.8
KGA	Spokane, Wash.	Northwest Radio Service	5,000	880	340.7
KGAR	Tucson, Ariz.	Tucson Citizen	100	1,230	243.8
KGBS	Seattle, Wash.	A. O. Dailey	100	1,320	227.1
KGBU	Ketchikan, Alaska	Alaska Radio & Service Co.	500	1,310	228.0
KGBX	St. Joseph, Mo.	Foster Hall Tire Co. (Inc.)	100	800	348.6
KGBY	Shelby, Nebr.	Dunning & Taddiken	100	1,480	202.6
KGBZ	York, Nebr.	Dr. George R. Miller	100	900	335.1
KGCA	Decorah, Iowa	Charles Walter Greenley	10	1,070	280.2
KGCB	Oklahoma, Okla.	Wallace Radio Institute	125	940	319
KGCC	Newark, Ark.	Moore Motor Co.	100	1,250	234.2
KGCH	Wayne, Nebr.	Wayne Hospital	250	1,240	241.8
KGCI	San Antonio, Tex.	Liberto Radio Sales	15	1,250	239.9
KGCL	Seattle, Wash.	Louis Warner and Archie Tait	50	1,260	238
KGCN	Concordia, Kans.	Concordia Broadcasting Co.	50	1,450	206.7
KGOR	Brookings, S. Dak.	Cutler's Radio Broadcasting Service	15	1,190	252
KGCU	Mandan, N. Dak.	Mandan Radio Association	100	1,050	285.5
KGCK	Vida, Mont.	First State Bank of Vida	10	1,250	239.9
KGDA	Dell Rapids, S. Dak.	Home Auto Co.	15	1,180	254.1
KGDE	Barratt, Minn.	Jaren Drug Co.	50	1,260	232.4
KGDJ	Cresco, Iowa	H. H. Rathert	10	1,480	202.6
KGDM	Stockton, Calif.	Victor G. Koping and E. F. Peifer	10	1,350	217.3
KGDP	Seattle, Wash.	Two Scouts of America	10	1,150	260.7

RADIO SERVICE BULLETIN

List of broadcasting stations issued temporary permits—Continued

Call letters	Location of station	Owner	Power	Fre-	Wave
				quency	length
			Watts	Kilo-	Meters
				cycles	
KGDR	San Antonio, Tex.	Radio Engineers	15	1,550	229.9
KGDW	Humboldt, Nebr.	Frank J. Rist	100	1,340	341.8
KGDY	Oldham, S. Dak.	J. Albert Loesch	15	1,420	309.7
KGEF	Los Angeles, Calif.	Trinity Methodist Church	500	570	529
KGEH	Eugene, Oreg.	Eugene Broadcasting Station	50	1,370	336.1
KGEK	Yuma, Colo.	Boehler Electric Equipment Co.	10	1,160	262
KGEN	El Centro, Calif.	E. R. Irey and F. M. Bowler	15	1,080	377.6
KGEO	Grand Island, Nebr.	Hotel Yancy	100	1,110	370.1
KGEQ	Minneapolis, Minn.	Fred W. Herrmann	50	600	533.1
KGER	Long Beach, Calif.	C. Merwin Babyns	100	920	325.9
KGES	Central City, Nebr.	Central Radio Electric Co.	10	1,465	305.4
KGEU	Lower Lake, Calif.	L. W. Clement	50	1,350	323.1
KGEW	Fort Morgan, Colo.	City of Fort Morgan	10	1,170	324.2
KGEY	Denver, Colo.	J. W. Diatz	15	1,470	304
KGEZ	Kathlamet, Mont.	Flathead Broadcasting Association	100	850	351.7
KGFH	Iowa City, Iowa	Albert C. Dunkel	10	1,340	323.7
KGFF	Alva, Okla.	Earl E. Hampshire	25	1,450	303.4
KGFC	Oklahoma City, Okla.	Pull Gospel Church	50	780	384.4
KGFH	La Graciana, Calif.	Frederick Robinson	100	1,370	313.8
KGFI	Fort Stockton, Tex.	M. L. Farris	15	1,360	320.4
KGFI	Los Angeles, Calif.	Ben S. McClashan	100	1,350	315.7
KGFK	Haltom, Minn.	Klitsen County Enterprise Co.	50	1,340	323.7
KGFL	Trinidad, Colo.	Trinidad Broadcasting Co.	50	1,245	322.1
KGFM	Yuba City, Calif.	George W. Johnson	15	670	447.5
KGFN	Aneta, N. Dak.	Haraldson & Tolingstad	15	1,350	322.1
KGFP	Mitchell, S. Dak.	Mitchell Broadcast Co.	10	1,140	393
KGO	Oakland, Calif.	General Electric Co.	12,500	830	361.2
KGHC	San Antonio, Tex.	Gena Roth & Co.	50	1,360	320.4
KGHS	Amarillo, Tex.	Gish Radio Service	100	1,240	334.9
KGTT	San Francisco, Calif.	Glad Tidings Tabernacle	50	1,440	306.6
KGU	Honolulu, Hawaii	Marian A. Maloney	500	1,110	370.1
KGW	Portland, Oreg.	Morning Oregonian	1,000	610	491.6
KGY	Lacey, Wash.	St. Martin's College	50	1,060	377.6
KHJ	Los Angeles, Calif.	Tunes Mirror Co.	500	740	405.2
KHQ	Spokane, Wash.	Louis Warner	1,000	760	394.5
KICK	Anita, Iowa	Atlantic Automobile Co.	100	1,100	372.4
KJBS	San Francisco, Calif.	J. Brunton & Sons (Inc.)	5	1,360	320.4
KJR	Seattle, Wash.	Northwest Radio Service Co.	5,000	780	381.4
KKP	do.	City of Seattle Harbor Department	50	1,150	300.7
KLDS	Independence, Mo.	Reorganized Church of Jesus Christ	1,500	680	440.9
KLIT	Portland, Oreg.	Lewis Irvine Thompson	10	880	343.6
KLK	Oakland, Calif.	Warner Brothers	350	1,300	348.9
MLX	Oakland, Calif.	Tribune Publishing Co.	500	650	503.2
KLZ	Denver, Colo.	Reynolds Radio Co. (Inc.)	500	780	384.4
KMA	Shenandoah, Iowa	May Seed & Nursery Co.	500	620	481.8
KMED	Medford, Oreg.	W. J. Virgin	50	1,200	342.9
KMIC	Inglwood, Calif.	J. R. Fouch	250	1,150	300.7
KMJ	Fresno, Calif.	The Fresno Bee	50	1,250	324.2
KMMJ	Clay Center, Nebr.	M. M. Johnson Co.	1,000	1,210	328.9
KMO	Tacoma, Wash.	KMO (Inc.)	500	1,200	342.9
KMOX	St. Louis, Mo.	Voice of St. Louis	5,000	1,070	360.2
KMTR	Los Angeles, Calif.	KMTR Radio Corporation	500	790	373.5
KNRC	Santa Monica, Calif.	Clarence H. Jubb	100	1,240	328
KNX	Los Angeles, Calif.	Los Angeles Express	500	690	394.9
KOA	Denver, Colo.	General Electric Co.	12,500	830	362.4
KOAC	Corvallis, Oreg.	Oregon Agricultural College	500	1,070	360.2
KOB	State College, N. Mex.	New Mexico College of Agriculture	5,000	800	368.6
KOCH	Omaha, Nebr.	Omaha Central High School	500	1,100	326.6
KOCW	Chickasha, Okla.	Oklahoma College for Women	500	1,110	370.1
KOIL	Council Bluffs, Iowa	Moist Motor Oil Co.	5,000	980	305.9
KOIN	Portland, Oreg.	KOIN (Inc.)	1,000	940	319
KOLO	Durango, Colo.	Gerald K. Hunter	5	800	352.7
KOMO	Seattle, Wash.	Fisher's Island Station	1,000	950	305.9
KOWW	Walla Walla, Wash.	Frank A. Moore	500	1,180	308.6
KPBM	Seattle, Wash.	Pacific Coast Biscuit Co.	50	570	528
KPNM	Prescott, Ariz.	Wilburn Radio Service	15	1,400	214.2
KPNP	Muscataine, Iowa	Central Radio Co.	100	1,180	217.2
KPO	San Francisco, Calif.	Hale Bros. and The Chronicle	1,000	700	429.2
KPPC	Pasadena, Calif.	Pasadena Presbyterian Church	50	1,210	228.9
KPRC	Houston, Tex.	Houston Printing Co.	500	1,070	294.9
KPN	Pasadena, Calif.	Pasadena Star-News Publishing Co.	1,000	690	312.6
KQV	Pittsburgh, Pa.	Douglas Hill Electric Co.	100	850	351.7
KQW	San Jose, Calif.	First Baptist Church	100	1,120	367.7
KHAC	Shreveport, La.	Caddo Radio Club	50	1,260	280.4
KRLD	Dallas, Tex.	Dallas Radio Laboratories (Inc.)	500	690	390.9
KRLO	Los Angeles, Calif.	Freeman, Lang, and A. B. Scott	250	680	440.9

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List of broadcasting stations issued temporary permits—Continued

Call letters	Location of station	Owner	Power	Fre-	Wave
				quency	length
				Kilo-	Meters
			Watts	cycles	
KBAC	Manhattan, Kans.	Kansas State Agricultural College	500	880	340.7
KBBA	Shreveport, La.	W. G. Patterson	1,000	1,150	260.7
KBCJ	Sioux City, Iowa	Perkins Bros. Co.	500	1,150	260.7
KBD	St. Louis, Mo.	Pulitzer Publishing Co.	500	550	545.1
KBEI	Pocatello, Idaho	KBEI Broadcasting Association	500	1,150	260.7
KBL	Salt Lake City, Utah	Radio Service Corporation	1,000	1,000	299.8
KBMR	Santa Maria, Calif.	Santa Maria Valley Railroad	100	1,000	299.8
KBO	Clarinda, Iowa	Berry Seed Co.	500	740	405.2
KBOO	Sioux Falls, S. Dak.	Sioux Falls Broadcasting Association	250	1,370	218.8
KTAB	Oakland, Calif.	Associated Broadcasters	1,000	990	302.8
KTAP	San Antonio, Tex.	Robert B. Bridge	10	1,340	223
KTBI	Los Angeles, Calif.	Bible Institute	750	1,020	293.9
KTBR	Portland, Oreg.	M. E. Brown	50	1,140	263
KTCL	Seattle, Wash.	American Radio Tel. Co.	1,000	1,050	285.8
KTIE	Hot Springs, Ark.	New Arlington Hotel	500	800	374.8
KTNT	Muscatoine, Iowa	Norman Baker	1,100	600	333.1
KTSA	San Antonio, Tex.	Alamo Broadcasting Co.	2,000	1,140	263
KTUE	Houston, Tex.	Uhalt Electric	5	1,140	263
KTW	Seattle, Wash.	First Presbyterian Church	1,000	700	454.3
KUOA	Fayetteville, Ark.	University of Arkansas	500	1,000	299.8
KUOM	Missoula, Mont.	University of Montana	500	800	374.8
KUSD	Vermillion, S. Dak.	University of South Dakota	250	1,060	277.6
KUT	Austin, Tex.	University of Texas	500	1,100	272.6
KVI	Tacoma, Wash.	Puget Sound Radio Broadcasting Co.	15	870	344.6
KVOO	Bristow, Okla.	Southwestern Sales Corporation	1,000	800	374.8
KVOS	Seattle, Wash.	L. L. Jackson and L. Kessler	500	900	333.1
KWBS	Portland, Oreg.	Schaeffer Radio Co.	15	1,400	211.2
KWCR	Cedar Rapids, Iowa	H. F. Paar	500	1,360	220.4
KWG	Stockton, Calif.	Portable Wireless Tel. Co.	50	1,210	247.8
KWKC	Kansas City, Mo.	Wilson Duncan Studios	100	1,270	235.1
KWKH	Shreveport, La.	W. K. Henderson	1,000	900	333.1
KWLC	Decatur, Iowa	Luther College	50	700	428.3
KWSC	Pullman, Wash.	State College of Washington	500	850	348.6
KWTC	Santa Ana, Calif.	John Wesley Hancock	5	1,140	263
KWUC	Lemars, Iowa	Western Union College	1,500	1,100	269
KWWG	Brownsville, Tex.	Chamber of Commerce	500	1,080	277.6
KXL	Portland, Oreg.	KXL Broadcasters	50	770	389.4
KYA	San Francisco, Calif.	Pacific Broadcasting Corporation	500	1,640	182.3
KYW	Chicago, Ill.	Westinghouse Electric & Manufacturing Co.	5,000	500	335.4
KZM	Oakland, Calif.	Preston D. Allen	100	1,250	239.9
WAAD	Cincinnati, Ohio	Ohio Mechanical Institute	25	1,100	272.8
WAAP	Chicago, Ill.	Chicago Daily Drovers	500	1,080	277.6
WAAM	Newark, N. J.	Isalah R. Nelson	500	1,140	263
WAAT	Jersey City, N. J.	Frank V. Bremer	500	1,270	235.1
WAAW	Omaha, Neb.	Omaha Grain Exchange	500	780	384.4
WABC	Richmond Hill, N. Y.	Atlantic Broadcasting Corporation	5,000	850	348.6
WABF	Pringleboro, Pa.	Markle Broadcasting Corporation	250	1,070	280.2
WABI	Bangor, Me.	First Universalist Church	100	1,110	270.1
WABO	Rochester, N. Y.	Hickson Electric Co.	100	1,080	277.6
WABQ	Philadelphia, Pa.	Keystone Broadcasting Co.	100	1,150	260.7
WABR	Toledo, Ohio	Scott High School	50	880	340.7
WABW	Wester, Ohio	The College of Wester	50	1,450	206.8
WABY	Philadelphia, Pa.	John Magaldi, Jr.	50	1,240	241.6
WABZ	New Orleans, La.	Collis Place Baptist Church	50	1,600	187.5
WADC	Akron, Ohio	Allen T. Simons	1,000	1,100	272.8
WAFD	Detroit, Mich.	Albert B. Parfet Co.	250	1,250	239.9
WAGM	Royal Oak, Mich.	Robert L. Miller	50	1,330	225.4
WAGE	Somerville, Mass.	Willow Garage	5	1,200	249.9
WAIT	Taunton, Mass.	A. H. White & Co.	10	1,310	228.9
WAIU	Columbus, Ohio	American Insurance Union	5,000	1,020	293.9
WALK	Portable	Albert A. Walker	50	1,470	204
WAMD	Minneapolis, Minn.	Radson Radio Corporation	1,000	1,230	243.8
WAPI	Auburn, Ala.	Alabama Polytechnic Institute	1,000	650	461.3
WARS	Brooklyn, N. Y.	Amateur Radio Specialty	500	1,190	252
WASH	Grand Rapids, Mich.	Baxter Launderers and Cleaners	500	1,170	256.3
WATT	Boston, Mass.	Edison Electric Illuminating Co.	100	1,470	204
WBA	West Lafayette, Ind.	Purdue University	500	1,100	272.6
WBAK	Harrisburg, Pa.	Penn. State Police	500	1,050	285.1
WBAL	Baltimore, Md.	Consolidated Gas & Power Co.	5,000	1,220	245.8
WBAO	Decatur, Ill.	James Milliken University	100	1,110	270.1
WBAP	Fort Worth, Tex.	Carter Publications	1,500	650	475.9
WBAW	Nashville, Tenn.	Waldron Drug Co.	100	1,270	236.1
WBAX	Wilkes-Barre, Pa.	J. H. Stenger, Jr.	100	1,170	256.3
WBBC	Brooklyn, N. Y.	Brooklyn Broadcasting Corporation	500	1,120	267.7
WBRL	Richmond, Va.	Grace Covenant Presbyterian Church	100	1,310	228.9
WBBM	Chicago, Ill.	Atlas Investment Co.	5,000	1,350	220.4
WBFP	Petoskey, Mich.	Petoskey High School	100	1,260	238

List of broadcasting stations issued temporary permits—Continued

Call letters	Location of station	Owner	Power	Frequency	Wave length
			Watts	Kilo-cycles	Meters
WBDZ	(Portable), Illinois	O. L. Carrell	100	1,470	204
WBON	Chicago, Ill.	Foster M. McDonnell	500	1,190	252
WBES	Takoma Park, Md.	Bliss Electrical School	100	1,350	222.1
WBET	Boston, Mass.	Boston Transcript Co.	500	760	394.5
WBKN	Brooklyn, N. Y.	Arthur Paake	100	1,210	247.8
WBMII	Detroit, Mich.	Braun's Music House	100	850	352.7
WBMS	Union City, N. J.	George Julius Schowrer	100	1,310	228.7
WBQY	New York, N. Y.	Baruchrome Corporation	500	1,010	298.9
WBON	Richmond Hill, N. Y.	Atlantic Broadcasting	500	1,270	236.1
WBRO	Birmingham, Ala.	Birmingham Broadcasting Co.	250	1,210	247.8
WBRE	Wilkes-Barre, Pa.	Baltimore Radio Exchange	100	1,300	230.8
WBRI	Tilton, N. H.	Booth Radio Laboratory	500	650	461.3
WBRS	Brooklyn, N. Y.	North American Broadcasting Corporation	100	1,210	247.8
WBSO	Wellesley Hills, Mass.	Hobson's Statistical Organization	100	1,240	241.9
WBT	Charlotte, N. C.	Charlotte Chamber of Commerce	250	1,080	278.1
WBZ	Springfield, Mass.	Westinghouse Electric & Manufacturing Co.	20,000	900	333.1
WBZA	Boston, Mass.	do.	500	900	333.1
WCAC	Mansfield, Conn.	Connecticut Agricultural College	500	1,050	276.1
WCAD	Canton, N. Y.	St. Lawrence University	500	1,140	263
WCAE	Pittsburgh, Pa.	Kaufmann & Bear Co.	500	650	461.3
WCAH	Columbus, Ohio	C. A. Entekin	250	1,135	265.3
WCAJ	University Place, Nebr.	Nebraska Wesleyan University	100	1,150	259.1
WCAL	Northfield, Minn.	St. Olaf College	500	850	352.9
WCAM	Camden, N. J.	City of Camden	1,000	850	352.9
WCAO	Baltimore, Md.	Monumental Radio (Inc.)	500	1,000	295.1
WCAT	Rapid City, S. Dak.	South Dakota State School of Mines	100	1,250	239.9
WCAU	Philadelphia, Pa.	Universal Broadcasting Co.	500	1,080	277.8
WCAX	Burlington, Vt.	University of Vermont	100	1,100	272
WCAZ	Carthage, Ill.	Carthage College	50	1,220	245.8
WCBA	Allentown, Pa.	Chas. W. Heimbach	150	1,150	259.1
WCBD	Zion, Ill.	Wilber Glenn Vulliamy	5,000	870	344.8
WCBF	New Orleans, La.	Urbalt Radio Co.	5	1,140	259
WCBH	Oxford, Miss.	University of Mississippi	100	1,250	241.8
WCBM	Baltimore, Md.	Hotel Chateau	100	1,310	229.9
WCBR	Providence, R. I.	Charles H. Munster	100	1,400	207.2
WCBT	Springfield, Ill.	Harold L. Dewing and Charles Masler	250	1,250	240.8
WCCO	Minneapolis, Minn.	Washburn Crosby Co.	5,000	720	416.4
WCFL	Chicago, Ill.	Chicago Federation of Labor	1,500	610	491.8
WCLO	Camp Lake, Wis.	C. E. Whitmore	100	1,300	230.8
WCLS	Joliet, Ill.	WOLS (Inc.)	150	1,450	206.8
WCMA	Culver, Ind.	Culver Military Academy	500	1,050	276.5
WCOA	Pensacola, Fla.	City of Pensacola	500	1,190	252
WCOB	Columbus, Miss.	Crystal Oil Co.	100	1,150	259.8
WCOT	Providence, R. I.	Jacob Conn	100	1,130	265.3
WCOW	Chicago, Ill.	Clinton R. White	500	750	399.6
WCSE	Portland, Me.	Congress Square Hotel Co.	500	600	499.7
WCSS	Springfield, Ohio	Wittenberg College	750	1,210	247.8
WCWK	Fort Wayne, Ind.	Chester W. Keen	500	1,250	239.2
WCWB	Bridgeport, Conn.	The Connecticut Portable Broadcasting Station	100	1,470	204
WDAD	Nashville, Tenn.	Dads Auto Accessories	1,000	1,330	225.4
WDAE	Tampa, Fla.	Tampa Daily Times	500	1,100	272.6
WDAP	Kansas City, Mo.	Kansas City Star	1,000	820	365.6
WDAG	Amarillo, Tex.	J. Laurence Martin	500	1,140	263
WDAH	El Paso, Tex.	Trinity Methodist Church	100	1,120	267.7
WDAY	Fargo, N. Dak.	Radio Equipment Corporation	250	1,150	260.7
WDBJ	Roanoke, Va.	Richardson-Wayland Electrical Co.	250	1,210	247.8
WDBK	Cleveland, Ohio	WDBK Broadcasting Station Co.	500	1,320	227.1
WDBO	Winter Park, Fla.	Rollins College	500	1,250	239.2
WDBZ	Kingston, N. Y.	Under Management of Kingston Chamber of Commerce	50	1,290	232.4
WDEL	Wilmington, Del.	Wilmington Electrical Specialty Co.	100	1,130	265.3
WDGY	Minneapolis, Minn.	George W. Young	500	1,140	263
WDOD	Chattanooga, Tenn.	Chattanooga Radio Co.	500	1,170	256.3
WDRC	New Haven, Conn.	Deolittle Radio Corporation	500	1,120	267.7
WDWF	Providence, R. I.	Dutes Wilcox Flint	500	450	666.6
WDWM	Newark, N. J.	Radio Industries Broadcast Co.	500	1,070	280.2
WDZ	Pensacola, Ill.	James L. Bush	100	1,050	277.8
WEAF	New York, N. Y.	National Broadcasting Co.	5,000	810	401.6
WEAL	Rhine, N. Y.	Cornell University	250	1,150	259.1
WEAM	North Plainfield, N. J.	Borough of North Plainfield	250	1,150	259.1
WEAN	Providence, R. I.	The Shepard Co.	500	820	365.8
WEAO	Columbus, Ohio	Ohio State University	750	1,020	293.9
WEAR	Cleveland, Ohio	Willard Storage Battery Co.	1,000	770	389.6
WEBC	Superior, Wis.	W. C. Bridgman	250	1,240	241.6
WEBS	Cambridge, Ohio	Roy W. Waller	10	1,250	239.2
WEHR	Chicago, Ill.	Kidswater Beach Hotel	6,000	610	479.2

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List of broadcasting stations issued temporary permits—Continued

Call letters	Location of station	Owner	Power	Fre-	Wave
				quency	length
			Watts	Kilo-	Meters
				cycles	
WEBR	Buffalo, N. Y.	H. H. Howell	100	3,238	243.8
WEBW	Beloit, Wis.	Beloit College	500	1,120	267.7
WEDO	Chicago, Ill.	Emil Denmark Broadcasting Station	1,000	1,200	240.0
WEEL	Boston, Mass.	Edison Electric Illuminating Co.	500	800	348.0
WEHS	Evanston, Ill.	A. T. Becker	100	1,340	241.8
WEMO	Berrien Springs, Mich.	Emmanuel Missionary College	500	960	315.0
WENR	Chicago, Ill.	Commonwealth Edison Co.	1,000	1,130	265.3
WEPB	Gloucester, Mass.	Matheson Radio Co.	100	1,020	293.0
WEW	St. Louis, Mo.	St. Louis University	1,000	830	361.2
WFAA	Dallas, Tex.	Dallas News and Dallas Journal	500	630	473.9
WFAM	St. Cloud, Minn.	Times Publishing Co.	10	1,100	272.0
WFBC	Knoxville, Tenn.	First Baptist Church	50	1,200	249.9
WFBE	Cincinnati, Ohio	Garfield Place Hotel Co.	500	1,200	232.4
WFBG	Alltoona, Pa.	W. F. Oable Co.	100	1,080	277.6
WFBJ	Collegeville, Minn.	St. John's University	100	1,270	236.1
WFBL	Syracuse, N. Y.	The Onondaga Co.	750	1,100	252
WFBN	Indianapolis, Ind.	Marchants Heating and Lighting Co.	250	1,120	267.7
WFBR	Baltimore, Md.	Fifth Infantry, National Guard	100	1,180	254.1
WFBZ	Galesburg, Ill.	Knox College	50	1,180	254.1
WFCI	Pawtucket, R. I.	Frank Crook (Inc.)	100	1,160	258.5
WFDF	Flint, Mich.	Frank D. Fallain	100	1,280	234.2
WFHH	Clearwater, Fla.	Fort Harrison Hotel	500	850	352.7
WFI	Philadelphia, Pa.	Strawbridge & Clothier	500	760	394.5
WFIW	Hopkinsville, Ky.	The Acme Mills (Inc.)	1,000	1,350	217.3
WFKB	Chicago, Ill.	Francis E. Dridgman (Inc.)	1,000	1,380	217.3
WFKD	Philadelphia, Pa.	Foukrod Radio Eng. Co.	10	1,160	272.0
WFLA	Boca Raton, Fla.	Boca Raton Radio Corporation	1,000	1,410	212.6
WFLB	Brooklyn, N. Y.	Fiathush Radio Corporation	500	1,460	205.4
WGAL	Lancaster, Pa.	Lancaster Electric Supply	10	1,210	247.8
WGBC	Memphis, Tenn.	First Baptist Church	15	1,080	277.6
WGBF	Evansville, Ind.	Pinke Furniture Co.	500	1,270	236.1
WGHI	Seranton, Pa.	Seranton Broadcasters (Inc.)	50	1,250	239.0
WGHS	Astoria, N. Y.	Gimbel Bros.	500	850	315.0
WGIX	Dromo, Me.	University of Maine	250	1,290	234.2
WGCP	Newark, N. J.	May Radio Broadcast Corporation	500	1,160	252
WGES	Chicago, Ill.	Oak Leaves Broadcasting Corporation	500	940	319
WGHP	Mount Clemens, Mich.	George Harrison Phelps (Inc.)	1,500	1,110	270.1
WGL	New York, N. Y.	International Broadcast Corporation	100	720	416.4
WGM	Jeanette, Pa.	Verne and Elton Spencer	100	1,110	270.1
WGMU	New York, N. Y.	Atlantic Broadcasting Corporation	100	1,470	204
WGN	Chicago, Ill.	The Tribune Co.	23,000	990	302.8
WGR	Buffalo, N. Y.	Federal Radio Corporation	750	940	319.1
WGST	Atlanta, Ga.	Georgia School of Technology	500	1,110	270.1
GWWB	Milwaukee, Wis.	Radiocast Corporation of Wis.	1,000	780	384.4
WGY	Schenectady, N. Y.	General Electric Co.	50,000	790	379.0
WHA	Madison, Wis.	University of Wisconsin	750	360	835.4
WHAM	Rochester, N. Y.	Stromberg Carlson Telephone Manu- facturing Co.	50	1,060	277.0
WHAP	New York, N. Y.	William H. Taylor Finance Corporation	500	1,010	296.0
WHAR	Atlantic City, N. J.	F. P. Cooks Sons (Inc.)	500	1,090	275.1
WHAS	Louisville, Ky.	Courier Journal and Louisville Times	500	760	399.8
WHAZ	Troy, N. Y.	Rensselaer Polytechnic Institute	500	700	379.5
WHB	Kansas City, Mo.	Sweeney Auto School Co.	500	820	365.0
WHBA	Oil City, Pa.	C. C. Shaffer	10	1,200	249.0
WHBC	Canton, Ohio	St. John's Catholic Church	10	1,180	254.1
WHBD	Bellefontaine, Ohio	Chamber of Commerce	100	1,350	222.1
WHBF	Rock Island, Ill.	Beardsley Specialty Co.	100	1,350	222.1
WHBL	Portable	C. L. Carroll	100	1,470	204
WABM	Portable	C. L. Carroll	100	1,470	204
WBDN	St. Petersburg, Fla.	First Avenue Methodist Episcopal Church	10	1,260	238
WBHP	Johnstown, Pa.	Johnstown Auto Co.	500	1,170	256.3
WBHQ	Memphis, Tenn.	Broadcasting Station WBHQ (Inc.)	100	1,290	232.4
WBHU	Anderson, Ind.	Citizens Bank	15	1,370	218.8
WLBW	Philadelphia, Pa.	D. R. Klenke	100	1,350	218.7
WBRY	West De Pere, Wis.	St. Norberts College	50	1,200	249.0
WIDI	Minneapolis, Minn.	W. H. Dunwoody Institute	600	1,050	277.0
WHFC	Rochester, N. Y.	Hickson Elec. Co. (Inc.)	500	1,160	258.5
WHK	Chicago, Ill.	Triangle Broadcasters	200	1,150	258.5
WHK	Cleveland, Ohio	Radio Air Service Corporation	500	1,100	272.0
WHN	New York, N. Y.	George Schubel	500	830	361.2
WHO	Des Moines, Iowa	Bankers Life Co.	5,000	570	526
WHT	Chicago, Ill.	Radiophone Broadcasting Corporation	5,000	1,260	218
WIAD	Philadelphia, Pa.	Howard R. Miller	100	1,280	234.2
WIAS	Burlington, Iowa	Homo Electric	100	1,180	254.1
WIBA	Madison, Wis.	Capital Times-Strand Theater	250	1,270	216.1
WIBG	Elkins Park, Pa.	St. Paul's Protestant Episcopal Church	50	1,350	222.1
WIBI	Flushing, N. Y.	F. B. Zittell, jr.	100	1,370	218.8
WIBJ	Portable	C. L. Carroll	100	1,470	204

List of broadcasting stations issued temporary permits—Continued

Call letters	Location of station	Owner	Power	Frequency	Wave length
			Watts	Kilo-cycles	Meters
WIBS	Elizabeth, N. J.	Lieut. Thos. F. Hamler	150	1,450	204.6
WIBU	Poyonetta, Wis.	Wisconsin State Journal Co.	20	1,450	204.1
WIBW	Portable	O. L. Carroll	100	1,470	204.7
WIBX	Utica, N. Y.	WIBX (Inc.)	150	1,250	234.2
WIBZ	Montgomery, Ala.	A. D. Trum	15	1,500	200.0
WIOC	Bridgeport, Conn.	Bridgeport Broadcasting Station	500	1,000	300.0
WIL	St. Louis, Mo.	Benson Radio Broadcasting Co.	250	1,100	272.7
WIOD	Milani, Fla.	Carl G. Fisher Co.	1,000	1,210	247.8
WIP	Philadelphia, Pa.	Gimbel Bros.	400	800	375.0
WJAD	Waco, Tex.	Frank P. Jackson	500	850	352.9
WJAG	Norfolk, Nabr.	Norfolk Daily News	500	1,110	270.3
WJAK	Kokomo, Ind.	J. A. Kautz	30	1,150	260.9
WJAM	Cedar Rapids, Iowa	D. M. Kerham	100	1,120	267.7
WJAR	Providence, R. I.	The Outlet Co.	500	620	483.6
WJAS	Pittsburgh, Pa.	Pittsburgh Radio Supply House	500	1,000	300.0
WJAX	Jacksonville, Fla.	City of Jacksonville	1,000	850	352.9
WJAY	Cleveland, Ohio	Cleveland Radio Broadcasting Co.	1,000	650	460.9
WJAZ	Mount Prospect, Ill.	Zenith Radio Corporation	4,000	700	428.6
WJBA	Joliet, Ill.	J. H. Lutz, Jr.	50	1,450	204.6
WJBB	St. Petersburg, Fla.	Financial Journal	150	1,180	254.2
WJBO	La Salle, Ill.	Hummer Furniture Co.	100	1,250	234.2
WJBI	Red Bank, N. J.	Robert S. Johnson	250	1,370	218.9
WJBK	Ypsilanti, Mich.	Ernest F. Goodwin	15	1,200	250.0
WJBL	Decatur, Ill.	William Gushard Dry Goods Co.	500	1,110	270.3
WJBO	New Orleans, La.	Valdemar Jensen	100	1,120	267.7
WJBR	Omro, Wis.	Gensch & Stearns	100	1,320	227.1
WJBT	Chicago, Ill.	John S. Boyd (Inc.)	10	640	468.8
WJBU	Lewisburg, Pa.	Rucknell University	100	1,420	204.2
WJBW	New Orleans, La.	C. Carlson, Jr.	30	1,110	270.3
WJBY	Gooden, Ala.	Electric Construction Co.	50	1,110	270.3
WJBZ	Chicago Heights, Ill.	Roland G. Pamer and Anthony Coppetelli	100	1,430	203.5
WJJD	Meosheart, Ill.	L. O. O. M., Supreme Lodge of the World	1,000	810	370.2
WJFW	Ashtabula, Ohio	J. P. Wilson	30	1,250	234.2
WJR	Pontiac, Mich.	Station WJR (Inc.) and WCX, the Detroit Free Press	5,000	480	625.0
WJE	Bound Brook, N. J.	R. C. A.	40,000	620	484.3
WKAJ	Milwaukee, Wis.	WKAJ Broadcasting	500	1,100	272.7
WKAQ	San Juan, P. R.	Radio Corporation of Porto Rico	500	880	340.9
WKAU	East Lansing, Mich.	Michigan State College	1,000	1,000	300.0
WKAU	Lacuna, N. H.	Lacuna Radio Club	100	1,340	223.7
WKHH	Joliet, Ill.	Sanders Bros.	150	1,400	214.3
WKBO	Birmingham, Ala.	H. L. Arley	50	1,350	222.2
WKBE	Webster, Mass.	K. & B. Electric Co.	100	1,110	270.3
WKBG	Indianapolis, Ind.	Noble B. Watson	500	1,230	243.9
WMBG	Illinois (portable)	C. L. Carroll	100	1,470	204.0
WKBB	La Crosse, Wis.	Callaway Music Co.	500	1,200	250.0
WKBI	Chicago, Ill.	Fred L. Schenewolf	50	1,500	200.0
WKBL	Monroe, Mich.	Monroe Radio Manufacturing Co.	15	1,100	272.7
WKBM	Newburgh, N. Y.	John Wilbur Jones	100	1,020	294.1
WKBW	Youngstown, Ohio	W. P. Williamson, Jr. (Radio Electric Service Co.)	100	800	375.0
WKBO	Jersey City, N. J.	Osmith Corporation	500	1,420	204.2
WKBQ	Battle Creek, Mich.	Battle Creek Inquirer News Co.	50	1,100	272.7
WKBQ	New York, N. Y.	Starlight Amusement Park	500	1,040	288.3
WKBS	Galesburg, Ill.	Permi N. Nelson	500	630	476.2
WKBT	New Orleans, La.	First Baptist Church	40	1,400	214.3
WKBW	New Castle, Pa. (portable)	Harry K. A. Armstrong	50	1,470	204.0
WKBV	Brookville, Ind.	Knorr Battery & Electric Co.	700	1,270	236.2
WKBW	Buffalo, N. Y.	Churchill Evangelistic Association	1,000	1,610	186.3
WKBZ	Ludington, Mich.	Karl L. Ashbacher	15	1,170	256.4
WKDR	Kenosha, Wis.	Edward A. Dato	15	610	491.5
WKJC	Lancaster, Pa.	Kirk Johnson & Co.	50	1,100	272.7
WKRC	Cincinnati, Ohio	The Kodel Radio Corporation	1,500	920	326.1
WKY	Oklahoma City, Okla.	WKY Radiophone Co.	150	800	375.0
WLAF	Louisville, Ky.	Virginia Avenue Baptist Church	30	1,000	300.0
WLBS	Minneapolis, Minn.	University of Minnesota	500	1,080	277.8
WLBC	Muncie, Ind.	D. A. Burton	50	1,540	194.8
WLBG	Kansas City, Mo.	Everett L. Dillard	125	1,420	204.2
WLBH	Petersburg, Va.	H. A. Gamble	100	1,500	200.0
WLBH	Portable	Joseph J. Lombardi	10	1,320	227.1
WLBH	East Venona, Ill.	Wenona Legion Broadcasters (Inc.)	500	1,050	285.7
WLRL	Evans Point, Wis.	Wisconsin Department of Markets	750	1,060	283.0
WLBW	Boston, Mass.	Browning Drake Corporation	50	740	405.4
WLBW	Portable	William Rwert Hiler	50	1,470	204.0
WLBW	Galesburg, Ill.	Frederick A. Treble, Jr.	100	1,220	245.9
WLBW	Ashland, Ohio	Robert A. Fox	15	1,500	200.0
WLBQ	Atwood, Ill.	E. Dale Trout	25	1,300	230.8

RADIO SERVICE BULLETIN

List of broadcasting stations issued temporary permits—Continued

Call letters	Location of station	Owner	Power	Fre-	Wave
				quency	length
			Watts	Kilo-	Meters
				cycles	
WLBV	Oil City, Pa.	Petroleum Telephone Co.	250	930	322.4
WLBX	Long Island City, N. Y.	John N. Braby	250	1,300	324.6
WLBZ	Iron Mountain, Mich.	Almona Electric	50	1,300	319.9
WLBY	Dover-Foxcroft, Me.	Thompson L. Ouseway	250	980	305.9
WLBI	Ithaca, N. Y.	Lutheran Association of Ithaca	50	1,130	265.3
WLIT	Philadelphia, Pa.	Lit Dico	500	790	394.5
WLS	Chicago, Ill.	Sears, Roebuck & Co.	3,000	870	344.6
WLTS	Do.	Lane Technical High School	100	2,160	254.5
WLW	Harrison, Ohio	The Crossley Radio Corporation	6,000	710	424.3
WLWL	New York, N. Y.	Missionary Society of St. Paul	1,000	780	384.4
WMAA	Cazenovia, N. Y.	C. B. Meredith	500	1,080	374.1
WMAF	South Dartmouth, Mass.	Round Hills Radio Corporation	1,000	680	444.9
WMAK	Lockport, N. Y.	Norton Laboratories (Inc.)	750	730	399.8
WMAL	Washington, D. C.	M. A. Lasse	150	1,030	302.9
WMAN	Columbus, Ohio	Hockett Radio Station	50	1,080	377.6
WMAQ	Chicago, Ill.	Chicago Daily News	1,000	870	447.5
WMAZ	St. Louis, Mo.	Klinghikway Presbyterian Church	100	1,210	347.8
WMB	Macon, Ga.	Moreau University	500	1,150	361.7
WMBB	Portland, Me.	Le Roy Joseph Beebe	100	1,200	348.9
WMBD	Chicago, Ill.	The American Bond & Mortgage Co.	500	1,200	348.9
WMBE	Detroit, Mich.	Michigan Broadcasting Co. (Inc.)	100	1,170	354.3
WMBF	Peoria Heights, Ill.	Peoria Heights Radio Laboratory	250	1,080	377.6
WMBG	St. Paul, Minn.	Dr. C. S. Stevens	10	1,260	336.4
WMBH	Miami Beach, Fla.	Fleurwood Hotel Corporation	500	780	384.4
WMBI	Richmond, Va.	Havens & Martin	15	1,340	320.4
WMBJ	Portland, Me.	Edwin Dudley Aber	100	1,470	304
WMBK	Chicago, Ill.	Moody Bible Institute	500	1,040	388.3
WMBL	Monaca, Pa.	William Roy Melshadray	50	1,080	377.6
WMBM	Lakeland, Pa.	Benedict Radio Studios	10	780	379.5
WMBN	Memphis, Tenn.	Seventh Day Adventist Church	10	1,400	314.2
WMBP	Auburn, N. Y.	Radio Service Laboratories	200	1,280	338
WMBQ	Brooklyn, N. Y.	Paul J. Gollhofer	100	1,430	307.7
WMBR	Tampa, Fla.	F. J. Reynolds	100	1,200	348.9
WMBT	Harrisburg, Pa.	Mack Battery Co.	500	820	368.6
WMBU	Pittsburgh, Pa.	Paul J. Miller	50	740	406.2
WMBV	Youngstown, Ohio	Youngstown Broadcasting Co. (Inc.)	50	1,080	377.6
WMBW	Bloomington, Ill.	Robert A. Isaacs	15	1,410	312.6
WMC	Memphis, Tenn.	Commercial Publishing Co.	500	680	438.7
WMD	Hoboken, N. J.	Greedy Square Hotel Co.	500	880	342.7
WME	Lapeer, Mich.	First Methodist Protestant Church	30	1,480	302.6
WMI	Jamaica, N. Y.	Paul J. Prinz	10	1,320	327.6
WMIJ	New York, N. Y.	Madison Square Garden	500	990	302.6
WMK	Boston, Mass.	The Shepard Stores	100	1,070	382.2
WML	Do.	Co.	500	710	424.3
WMO	Norman, Okla.	University of Oklahoma	500	1,180	354.1
WMP	Omaha, Nebr.	R. J. Rockwell	500	1,180	354.1
WMPA	Philadelphia, Pa.	Lanning Bros. Co.	100	1,200	348.9
WMPB	Yankton, S. Dak.	Gurney Seed & Nursery Co.	250	1,280	338
WMPD	Perot Park, Ill.	M. T. Rafferty	500	1,250	338
WMPF	Endicott, N. Y.	Hewitt-Wood Radio Co.	50	1,450	304.4
WMPG	New Bedford, Mass.	New Bedford Broadcasting Co.	250	1,210	347.8
WMPH	Knoxville, Tenn.	Lordsdale Baptist Church	50	890	338.9
WMPI	Bloomington, Ill.	Harvey R. Storm	15	1,410	312.6
WMPJ	Washington, Pa.	John Brownlee Springs	15	1,400	314.2
WMPK	Hochester, N. Y.	Gordon P. Brown	15	1,430	307.7
WMPL	Memphis, Tenn.	Popular Radio Shop	20	950	315.6
WMPM	Newark, N. Y.	Herman Lubinsky	500	820	368.6
WMPN	Knoxville, Tenn.	Peoples Telephone & Telegraph Co.	2,500	1,150	367.7
WMPQ	Greensboro, N. C.	Wynne M. Nelson	500	1,340	328.7
WMPR	New York, N. Y.	Department Plants and Structures	1,000	570	529
WMPD	San Antonio, Tex.	Southern Equipment Co.	5,000	780	394.5
WMPF	Lawrenceburg, Tenn.	James D. Vaughan	250	790	379.5
WMPG	Trenton, N. J.	Franklyn J. Wolff	100	1,250	338.9
WMPH	Davenport, Iowa	Palmer School Chiropractic	5,000	620	483.6
WMPI	Jamestown, N. Y.	A. E. Newton	25	1,090	378.1
WMPJ	Paterson, N. J.	O'Dea Temple of Music	1,000	680	438.7
WMPK	Ames, Iowa	Iowa State College	5,000	1,110	372.1
WMPL	Chicago, Ill.	Trisnon (Inc.)	5,000	1,280	338
WMPM	Peekskill, N. Y.	Harold E. Smith	500	1,290	337.4
WMPN	Rochester, N. Y.	Titus-Ets Corporation	500	600	509.7
WMPD	Manitowoc, Wis.	Mikadov Theatre	50	2,180	254.1
WMPF	Philadelphia, Pa.	John Wanamaker	500	500	609.2
WMPG	Purawood, Mich.	Walker B. Giles	500	1,240	351.8
WMPH	Kansas City, Mo.	Unity School of Christianity	1,000	1,080	374.1
WMPI	Newark, N. J.	L. Bamberger	500	740	408.2
WMPJ	Batavia, Ill.	Peoples Pulpit Association	5,000	1,000	374.1
WMPK	Jaffrum City, Mo.	Missouri State Marketing Bureau	500	850	440.9

List of broadcasting stations issued temporary permits—Continued

Call letters	Location of station	Owner	Power	Fre-	Wave
				quency	length
			Watts	Kilo-	Meters
				cycles	
WFOH	New York, N. Y.	Concourse Radio Corporation	500	1,100	272.6
WPDQ	Buffalo, N. Y.	Hiram L. Turner	50	1,460	205.4
WPEP	Waukegan, Ill.	Maurice Mayer	500	1,410	212.6
WPG	Atlantic City, N. J.	Municipality of Atlantic City	1,500	1,000	299.8
WPRC	Harrisburg, Pa.	Wilson Printing & Radio Co.	100	1,260	235.7
WPBC	State College, Pa.	Pennsylvania State College	500	1,150	260.7
WPSW	Philadelphia, Pa.	Philadelphia School of Wireless Tele-	50	1,270	234.1
		graphy.			
WQAA	Parkersburg, Pa.	H. A. Beale, Jr.	500	1,360	220.4
WQAE	Springfield, Vt.	Moore Radio News Station	50	1,220	245.8
WQAM	Miami, Fla.	Electrical Equipment Co.	750	1,050	285.5
WQAN	Scranton, Pa.	Scranton Times	100	1,200	249.9
WQAO	Cliffside, N. J.	Calvary Baptist Church	500	830	361.2
WQJ	Chicago, Ill.	Calumet Radio Broadcasting Co.	500	670	447.5
WRAF	Laporte, Ind.	Radio Club (Inc.)	100	1,840	223.7
WRAK	Escanaba, Mich.	Economy Light Co.	50	1,120	267.7
WRAK	Galesburg, Ill.	Lombard College	100	1,230	243.8
WRAV	Yellow Springs, Ohio	Antioch College	100	1,140	263
WRAW	Reading, Pa.	Avenue Radio & Electric Shop	100	1,260	238
WRAX	Philadelphia, Pa.	Bershad Church (Inc.)	500	1,120	267.7
WRBC	Valparaiso, Ind.	Immanuel Lutheran Church	500	1,060	277.6
WRC	Washington, D. C.	Radio Corporation of America	700	640	468.5
WRCO	Raleigh, N. C.	Wynne Radio Co.	250	1,100	252
WRRC	Memphis, Tenn.	WRRC (Inc.)	15	1,180	254.1
WREO	Lansing, Mich.	Reo Motor Car Co.	500	1,050	285.5
WRES	Wollaston, Mass.	Harry Leonard Sawyer	100	1,000	299.8
WRHF	Washington, D. C.	Washington Radio Hospital fund	50	1,170	259.3
WRHM	Minneapolis, Minn.	Rosedale Hospital	1,000	1,190	252
WRM	Urbana, Ill.	University of Illinois	1,000	1,100	272.6
WRMU	New York, N. Y.	Atlantic Broadcasting Corporation	100	1,470	204
WRNY	do.	Experimenter Publishing Co.	500	800	374.8
WRPI	Terre Haute, Ind.	Rose Polytechnic Institute	100	1,330	217.3
WRR	Dallas, Tex.	City of Dallas	500	1,220	245.8
WRRS	Racine, Wis.	Racine Radio Co.	50	830	361.2
WRSC	Chelsea, Mass.	William S. Pote	15	1,110	270.1
WRST	Bay Shore, N. Y.	Radiolac Manufacturing Co. (Inc.)	150	1,480	202.6
WRVA	Richmond, Va.	Larus & Bros. Co. (Inc.)	1,000	1,170	256.3
WSAJ	Cincinnati, Ohio	United States Playing Card Co.	3,000	920	325.9
WSAJ	Grove City, Pa.	Grove City College	250	1,310	228.9
WSAN	Allentown, Pa.	Allentown Call Publishing Co.	100	1,310	228.9
WSAR	Fall River, Mass.	Doughty & Welch Electric Co.	100	1,380	217.3
WSAX	Chicago, Ill.	Zenith Radio Corporation	100	940	319
WSAZ	Huntington, W. Va.	McKeller Electric Co.	100	1,230	243.8
WEB	Atlanta, Ga.	Atlanta Journal Co.	1,000	700	428.3
WEBC	Chicago, Ill.	World Battery Co.	1,000	1,040	288.3
WBET	South Bend, Ind.	South Bend Tribune	500	950	315.6
WBDA	New York, N. Y.	Seventh Day Adventist Church	250	1,140	263
WBEA	Virginia Beach, Va.	Virginia Beach Broadcasting	500	580	516.9
WBKX	Springfield, Tenn.	338 Tire & Vulcanizing Co.	150	2,200	242.9
WBKC	Bay City, Mich.	World's Star Knitting Co.	500	1,150	260.7
WBM	Nashville, Tenn.	National Life & Accident	1,000	1,060	282.8
WBMB	New Orleans, La.	Haenger Amusement Co.	500	940	319
WBME	Dayton, Ohio	S. M. K. Radio Corporation	500	1,000	275.1
WBOE	Milwaukee, Wis.	School of Engineering	1,000	1,220	245.8
WBOM	Woodhaven, N. Y.	Union Course Laboratories	100	1,040	288.3
WBRO	Hamilton, Ohio	Harry W. Fahrlander	100	1,160	252
WSSH	Boston, Mass.	Trueman Temple Baptist Church	100	1,150	260.7
WSUI	Iowa City, Iowa	State University of Iowa	500	620	483.6
WBVB	Buffalo, N. Y.	Seneca Vocational School	50	1,370	218.8
WSYR	Syracuse, N. Y.	Clive B. Meredith	500	850	352.7
WTAD	Quincy, Ill.	Illinois Stock Medicine Broadcasting Cor-	500	1,270	234.1
		poration.			
WTAG	Worcester, Mass.	Worcester Telegram	500	550	545.1
WTAL	Toledo, Ohio	Toledo Broadcasting Co.	100	1,180	254.1
WTAM	Cleveland, Ohio	Willard Storage Battery	5,000	770	389.4
WTAQ	Eau Claire, Wis.	C. B. Van Gorden	500	1,180	254.1
WTAR	Norfolk, Va.	Reliance Electrical Co.	500	1,150	260.7
WTAB	Batavia, Ill.	Richmond Harris & Co.	3,500	1,000	275.1
WTAW	College Station, Tex.	Agricultural College of Texas	500	1,110	270.1
WTAX	Streator, Ill.	Williams Hardware Co.	50	1,500	200.6
WTAZ	Lambertsville, N. J.	Thomas J. McGuire	15	1,150	260.7
WTHO	Ferndale, Mich.	W. J. Thomas Radio Co.	250	1,370	218.8
WTIC	Hartford, Conn.	Travelers Insurance Co.	500	630	475.9
WTRL	Midland Park, N. J.	Technical Radio Laboratory	15	930	322.4
WWAE	Joliet, Ill.	I. J. Crowley	2,000	1,240	241.8
WWJ	Detroit, Mich.	Evening News Association	1,000	850	352.7
WWL	New Orleans, La.	Loyola University	100	1,000	275.1
WWNC	Asheville, N. C.	Asheville Chamber of Commerce	500	1,150	254.1
WWRL	Woodside, N. Y.	W. H. Reuman	100	1,160	252

RADIO SERVICE BULLETIN

15

REGULATIONS GOVERNING OPERATION OF BROADCASTING STATIONS PROMULGATED BY THE FEDERAL RADIO COMMISSION

Broadcasting frequency band—General Order No. 4, April 5, 1927.—In view of the manifest inconvenience which would result to the listening public from any immediate widening of the frequency band devoted to radio broadcasting, the Federal Radio Commission will not at this time allocate to broadcasting station frequencies other than those between 550 and 1,500 kilocycles (545.1 to 199.9 meters), except on specific request of such stations. It believes, however, that the band between 1,500 and 2,000 kilocycles (199.9 to 149.9 meters) should, so far as may be practicable, be held open for experimental work in broadcasting and allied forms of radio service, to the end that, with the further development of the art, this band may be eventually made available for broadcasting, whether for the ear or the eye, if it shall prove particularly well adapted to such type of service to the public.

Extension of broadcast licenses—General Order No. 5, April 5, 1927.—On Sunday, April 24, at 11.50 p. m., terminates the period of 60 days during which, under section 40 of the radio act of 1927, no holder of a license or an extension thereof issued by the Secretary of Commerce, under the act of August 13, 1912, is subject to the penalties provided in the radio act of 1927 for operating a station without a license.

The Federal Radio Commission will issue a temporary permit to operate a radio broadcasting station, good only until final action is taken by the commission on the application for license, to each holder of a license or an extension thereof from the Secretary of Commerce, under the act of August 13, 1912, whose application for a license under the radio act of 1927, has been received by the Federal Radio Commission on or before April 24, 1927, and such temporary permit shall, until withdrawn, be considered as having the force and effect of a license in so far as the penalties provided in the radio act of 1927 are concerned.

After April 24, 1927, any person operating a radio broadcasting station otherwise than under the authority of such a temporary permit or a license issued by the Federal Radio Commission will be deemed by the commission to be operating a broadcasting station without a license.

Portable broadcasting stations licensed only for a limited period—General Order No. 6, April 25, 1927.—Since the exact location of any radio broadcasting transmitter is an essential feature of the license, the Federal Radio Commission, as already announced, will not consider any application for a broadcasting license, except for a very limited period of time, in which the permanent location of the transmitter is not specified. However, for the purpose of enabling so-called portable stations which were duly licensed under the law of 1912 to render service to the public during the spring and summer months, the Federal Radio Commission will issue to such stations licenses for not more than 120 days, to operate with not more than 100 watts power output, and with frequencies of 1,470 and 1,490 kilocycles only. Any such permit may be revoked by the commission at any time if it be shown that the operation of the station thus licensed is causing interference prejudicial to the public interest.

Maintenance of frequency prescribed for broadcasting stations—General Order No. 7, April 28, 1927.—The Federal Radio Commission hereby fixes a maximum of one-half kilocycle as the extreme deviation from authorized frequency which will be permitted to any broadcasting station operating under permit or license issued under the terms of the radio act of 1927. The Department of Commerce is hereby requested to notify its proper agents immediately of this order and to direct them to report promptly any apparent violations thereof. Maintenance of the assigned frequency, within the limits herein prescribed, is the duty of each radio broadcasting station, and violation of this order will be deemed by the Federal Radio Commission cause for the revocation of license under section 14 of the radio act of 1927.

To facilitate the execution of this order, each radio broadcasting station is hereby directed, effective 12.01 a. m., local time, Monday, May 9, to announce twice each day, at the beginning and end of its program, that it is broadcasting on a frequency of _____ kilocycles by authority of the Federal Radio Com-

RADIO SERVICE BULLETIN

VESSELS EQUIPPED WITH A RADIOCOMPASS

The following-named vessels have been equipped with a radiocompass (direction finder): *Carrabelle, Cassimir, John A. Topping, Francis E. House, George Stephenson, Howard M. Hanna, Jr., John H. McLean, J. Pierpont Morgan, Malietoa, Peter Reiss, Robert Hobson, Sir Wm. Fairbairn, Victoria, William F. Stifel, William Livingstone, Zenith City.*

HOURS OF OPERATION OF THUNDER BAY ISLAND LIGHT STATION RADIOBEACON CHANGED

Beacon will be operated each day during clear weather from 2.30 to 3 and 8.30 to 9 a. m.; and from 2.30 to 3 and 8.30 to 9 p. m. (Ninetieth meridian time).

CHANGES IN NAVAL RADIOCOMPASS STATIONS

The following changes should be made in the list of Commercial and Government radio stations, page 115:

Type	Station	Call	Position
Humboldt Bay.....	Eureka, Calif.....	NPW...	Lat. 40° 41' 49" N.; long. 124° 15' 33" W.
	Point St. George, Calif..	NYW...	Lat. 41° 47' 05" N.; long. 124° 15' 01" W.

Notes under the table, change, "United States Naval Radio Station, Boston, Mass.," to "United States Naval Radio Station, Deer Island, Mass."

Page 116, delete; "Key West, Fla.; NAR; lat. 24° 33' 22" N., long. 81° 48' 23" W.; c. w. and a. c. w.

"Great Lakes, Ill.; NAJ; lat. 42° 18' 30" N., long. 87° 50' 00" W.; c. w. and i. c. w."

The Fort Stevens (Oreg.) compass station now has a transmitter of its own, call signal NZR, which is located in latitude 46° 11' 32" N., longitude 123° 59' 15" W. This station is prepared to furnish beacon service on 800 meters. Type of transmission is c. w. and i. c. w.

TIME SIGNALS TRANSMITTED BY CHEBUCTO HEAD, NOVA SCOTIA

This station, call signal VAV, located in longitude 63° 31' 20" W., latitude 44° 30' 01" N., transmits time signals daily (Sundays excepted) on 600 meters, spark at 1,400 G. M. T. corresponding to 9 a. m. eastern standard time.

The procedure is as follows:

G. M. T.						Signal
h.	ss.	s.	h.	m.	s.	
13	58	0 to 13	58	57		Transmits a dot (.) at each second.
13	59	0				(.) Time signal.
13	59	3 to 13	59	50		Transmits a dot (.) at each second.
14	0	0				(.) Time signal.

DAYLIGHT-SAVING TIME ESTABLISHED IN FOREIGN COUNTRIES

The legal time has been advanced one hour in Belgium in the night of April 9 and 10, at midnight; in Spain on April 9 at 11 p. m. until midnight October 1; in France in the night of April 9 and 10 at 11 p. m.; in Great Britain on April 10 at 2 a. m. until October 2 at 2 a. m.

CANADIAN ICE PATROL ESTABLISHED

An ice patrol will be maintained in the Gulf of St. Lawrence from Cape Ray to Bird Rocks, Bird Rocks to the vicinity of Heath Point, Heath Point to Cape Ray from the opening of navigation in the spring until the route is clear of ice. The

a special call and will be used by whatever vessel is engaged in the service. A regular message embodying ice conditions from Cape Race to Quebec and recommendations as to route to be followed will be made up by the ice patrol every four hours, commencing as from midnight eastern standard time, seventy-fifth meridian, and kept on file for immediate transmission by radio to ships, upon request. This information will also be broadcast four times daily by the ice patrol (VCQ) as follows: At 8 a. m. and 8 p. m. (E. S. T.) on 600 meters, spark, and at 8.30 a. m. and 8.30 p. m. (E. S. T.) on 1,621 meters, i. e. w.

The coast stations at North Sydney (VCO) and Grindstone (VCN) will copy this message and will be prepared to pass the same to ships requesting it. Cape Race (VCE) will also include a brief summary of the message in his regular ice broadcast at 9.15 a. m. and 9.15 p. m. (E. S. T.) daily.

Ships requiring the latest information on the Gulf route should communicate directly with the ice patrol vessel VCQ on 600 meters, spark. The work of the patrol will be greatly facilitated if incoming ships will cooperate in applying information regarding ice in their vicinity.

ADDITIONAL RECEIVING POINT OPENED AT DEVIZES, GREAT BRITAIN

An additional receiving point will be opened at Devizes between the hours of 12.30 and 20.00 G. M. T. daily, except Sundays, from April 4, 1927, to October 29, 1927, inclusive. The 2,100 meters receiver will be used in conjunction with 2,111 meters transmitter. The other receiving wave lengths will be 2,300 and 2,600 meters, and the Devizes transmitter working in conjunction with these will use 2,400 meters. Ships will continue to reply on 2,400 meters to calls made during the assignment period (35 to 45 minutes past each hour G. M. T.). Turns and wave lengths to be used will be allotted by Devizes radio during this period. Outside the assignment and silence periods (35 to 45 minutes and 15 to 18 and 45 to 48 minutes past each hour G. M. T.) ships may call on any of the waves (2,100, 2,300, or 2,600 meters) which may be disengaged. The existing arrangements will remain in force on Sundays and outside the hours of 12.30 to 20.00 G. M. T. on week days.

With a view to reduce signaling and to expedite the handling of traffic the following letters will be used by Devizes radio during assignment periods (35 to 45 minutes past each hour G. M. T.) to indicate to British ships the wave lengths on which it is desired such ships shall send and receive:

W—Meaning, send and receive on 2,100 meters.

X—Meaning, send and receive on 2,400 meters.

Y—Meaning, send on 2,600 meters and receive on 2,400 meters.

Z—Meaning, send on 2,300 meters and receive on 2,400 meters.

The number of a ship's turn will be indicated by the addition of a numeral after the letter.

ACCESSIONS TO THE INTERNATIONAL CONVENTION

Finland on February 5, 1927, and French Guiana on January 5, 1927, adhered to the International Radiotelegraph Convention, signed at London, July 5, 1912.

NEW INTERIOR RATES OF HOLLAND

The interior rates appearing under the heading "Dutch East Indies," on pages 439 and 440 of the International List of Radiotelegraph Stations, should be replaced by the following: Originating radiograms or to destination: (a) From the locality in which the coast station is located, 0 fr. 10 per word for ordinary radiograms and 0 fr. 30 per word for urgent radiograms; (b) from other offices, 0 fr. 40 for ordinary radiograms and 1 fr. 30 for urgent radiograms.

RATES FOR INDO-CHINA

Beginning April 1, 1927, the minimum charge of 5 francs exacted by coast stations is canceled.

LAND-LINE RATES FOR NEW COAST STATION AT BALTIMORE

The land-line rates through this station (see page 2 for other particulars) to points in North America are as follows:

Alabama.....	\$0.07	Nebraska.....	\$0.07
Alaska.....	.15	Nevada.....	.11
Alberta.....	.11	New Brunswick.....	.05
Arizona.....	.11	Newfoundland.....	.12
Arkansas.....	.07	New Hampshire.....	.05
British Columbia.....	.11	New Jersey.....	.05
California.....	.11	New Mexico.....	.09
Colorado.....	.09	New York:	
Connecticut.....	.05	New York City and Brooklyn.....	.04
Delaware.....	.04	Other places.....	.05
District of Columbia.....	.04	North Carolina.....	.06
Florida.....		North Dakota.....	.09
Key West.....	.11	Nova Scotia.....	.06
Other places.....	.07	Ohio.....	.05
Georgia.....	.05	Oklahoma.....	.09
Idaho.....	.11	Ontario.....	.11
Illinois.....	.05	Oregon.....	.06
Indiana.....	.05	Pennsylvania.....	.04
Iowa.....	.07	Prince Edward Island.....	.09
Kansas.....	.07	Quebec.....	.05
Kentucky.....	.05	Rhode Island.....	.05
Labrador.....	.13	Saskatchewan.....	.11
Louisiana.....	.07	South Carolina.....	.05
Maine.....	.05	South Dakota.....	.09
Manitoba.....	.09	Tennessee.....	.05
Maryland.....		Texas.....	.09
Baltimore.....	.03	Utah.....	.09
Other places.....	.04	Vermont.....	.05
Massachusetts.....	.05	Virginia.....	.05
Mexico.....	.20	Washington.....	.11
Michigan.....	.05	West Virginia.....	.05
Minnesota.....	.07	Wisconsin.....	.07
Mississippi.....	.07	Wyoming.....	.09
Missouri.....	.07	Yukon.....	.41
Montana.....	.09		

CASQUETS LIGHTHOUSE, CHANNEL ISLANDS, FRANCE, RADIOBEACON DISCONTINUED

The experimental radiobeacon (fog signal) at this lighthouse, located in approximately 49° 13' N., 2° 23' W., has been discontinued. Arrangements are being made for the provision of a permanent radiobeacon, but several months will elapse before it is in operation.

GALE WARNINGS TRANSMITTED BY BRITISH STATIONS

Gale warnings, which are broadcast by the undermentioned radio stations during the period when ships carrying single operators are not keeping watch, will in future be repeated in the next watch-keeping period for single operators at either of the following times:

Station	Call signal	Position (latitude, longitude)	Time, G. M. T.
Wick.....	GKH	58° 20' N.; 3° 5' W.....	0500, 1200, 1600, or 2000.†
Land's End.....	GLD	50° 7' N.; 5° 40' W.....	
Seaforth.....	GLV	55° 28' N.; 3° 1' W.....	
Malin Head.....	GMH	55° 22' N.; 7° 20' W.....	
Cullercoats.....	GCO	55° 2' N.; 1° 26' W.....	
Niton.....	GNI	50° 35' N.; 1° 17' W.....	
Fishguard.....	GRI	52° 1' N.; 4° 59' W.....	0518, 1218, 1618, or 2018.†
Valencia.....	GOK	51° 56' N.; 16° 21' W.....	

† After the navigational warning, if one is broadcast.—British Admiralty Notice No. 547 of 1927.

RADIO FOG SIGNAL ESTABLISHED AT STUBBENKAMMER (BALTIC), GERMANY, AND SUBMARINE FOG SIGNAL ALTERED

This fog signal (radiobeacon) located in latitude 54° 34' 24" N., longitude 13° 39' 48" E., transmits on 1,050 meters (i. e. w.).

The signals consist of the transmission of the Morse letters SR SR (. . . . —) followed by 15 one-second dashes (.) etc.) every 30 seconds.

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.	Silent
8.5 sec.	1.253 sec.
-----	Silent
18.542 sec. (0.253 sec. interval between each dash)	1.705 sec.

These signals are repeated seven times in three and one half-minutes, followed by a silent interval of four minutes; the whole group of seven signals being transmitted eight times every hour.

The power of the transmitter is 60 watts, giving ranges of 30 miles (day) and 45 miles (night), with a minimum of 2° of arc; increasing to 85 miles with a minimum of 8°. Reception of the signals is possible on an audion receiver, with single valve and reaction coupling, up to 30 miles (day) and 45 miles (night), and on a similar receiver, with two low frequency (audio) valve amplification, up to three times these distances.

The new abridged description of the submarine fog signal is as follows:

Position.—The transmitter for the submarine fog signals is situated on the sea bed in latitude 54° 36' 09" N., longitude 13° 41' 55" E.

Details.—The signals, which are transmitted continuously, consist of the Morse letters SR (. . . . — .) and are sent out as follows:

.	Silent	.	Silent	.	Silent	.
0.6 sec.	0.6 sec.	0.6 sec.	0.6 sec.	0.6 sec.	1.8 sec.	0.6 sec.
Silent	-----	Silent	.	Silent	Total period:	30 seconds.
0.6 sec.	1.8 sec.	0.6 sec.	0.6 sec.	21 sec.		

Bearing.—The bearing of the radio fog signal station is determined in the usual manner by means of the ship's direction finder and that of the submarine fog signal by the submarine sound-receiving apparatus.

Distance.—Using the radio and submarine fog signals in conjunction with each other, the distance of the ship can be determined in the following manner:

The first dot (.) of the submarine fog signal is transmitted after the last dot of the radio fog signal (. . . . — — .). Count the number of radio dashes (— — — — etc.) which follow until the signal synchronizes with the receipt of the first dot (.) of the submarine signal. The number of the radio dash (—) is the required distance in miles from the position of the submarine fog signal transmitter.

Remarks.—The air fog signal at Stubbenkammer shore station (new abridged description "Fog Signal") remains unaltered.—(*British Admiralty Notice No. 558 of 1927.*)

DEVELOPMENT OF RADIO AIDS FOR CIVIL AIRWAYS

Shortly after the formation of the Aeronautics Branch of the Department of Commerce in July, 1926, a program of establishing aids to air navigation was begun. These aids are upper air weather information, airways lighting for night flying, and radio aids. The latter include radio telephony between airplane and ground and a special radiobeacon system. They are as yet in a development status. The experimental work required to perfect and adapt them to the requirements of the civil airways is being done by the Bureau of Standards.

A total of four aircraft radiobeacon stations are now established or under construction in the United States. Two of these were established before the Department of Commerce entered this field of work; they are the station of the War Department at McCook Field, Dayton, Ohio, and that of the Ford Motor Co., at Dearborn, Mich. The other two are the radiobeacons which form part of the experimental aeronautic radio stations established by the Bureau of Standards at College Park, Md., and Bellefonte, Pa. Research and development work have been in progress at the College Park station for some months, and construction work was begun at the Bellefonte station during April. Besides serving as laboratories to determine the best forms of radio aids for the civil airways, these two stations will be available to render actual radio service to the commercial air lines operating through these points after July 1. These lines are, respectively, the Pitcairn Co., operating the New York to Atlanta route, and the National Air Transport (Inc.), operating the New York to Chicago route. It is expected that similar stations will be established by the Department at various other points on the airways of the country.

The radio aids to air navigation which are incorporated in the stations of the Bureau of Standards are three in number, viz: the direction radiobeacon, the

type of radio beam by which the pilots are able to follow the designated course in total darkness or fog. The marker beacons are small radio transmitting sets which are placed at intervals of about 25 miles along the route and supplement the directive beacon by serving as mileposts. The radio telephone transmitting station is used to inform the pilots of weather conditions, landing places, and other navigational facts. In both the Bellefonte and the College Park installation the radio telephone transmitting station is located several miles from the radiobeacon station but is operated from a microphone located at the airport near the beacon station. Provisions are thus made for control of the whole system of radio aids by a single radio operator at the airport, who is also equipped with receiving apparatus for receiving from such airplanes as have transmitting sets. Wire line connections are also provided at Bellefonte for coordination of these operations with the radio telegraph communications between Bellefonte and other airports.

The bureau is carrying on this work with the cooperation of other Government departments, radio manufacturers and wire line companies, and the air transport companies. One of the results of the work to date is the conclusion that radio aids to air navigation will require the use of specially armored cable on airplanes for the engine ignition systems. With this simple precaution taken in the construction or equipping of airplanes all three radio aids can be utilized by the use of a very simple receiving set on each airplane. For the experimental work at Bellefonte one of the post office airplanes used in regular mail flights is being provided with shielding equipment.

While it is not expected that two-way telephony between airplanes and ground will be widely used immediately, the importance of this development will eventually make it an everyday service. Recent experiments at College Park have been devoted to this. Using a 100-watt transmitting set on the airplane, conversations were readily held with persons on the ground at distances up to 50 miles. Not only was conversation carried on between the airplane and the operators at the College Park station, but, through the cooperation of the telephone company, connections were made with the regular exchange. Officials of the Bureau of Standards sat at their desks and conversed with the observer in the airplane. This system was personally inspected by Assistant Secretary MacCracken, who expressed himself as much pleased with the possibilities of the radio telephone development after trying it in flight.

No publications have been prepared on this work and none are contemplated in the immediate future, since the system is still under development. Monthly announcements of the progress of the work are given in *Domestic Air News*, a monthly bulletin issued by the Aeronautics Branch, Department of Commerce.

STANDARD-FREQUENCY STATIONS

As a result of measurements by the Bureau of Standards upon the transmitted waves of a limited number of radio transmitting stations, data are given in each month's *RADIO SERVICE BULLETIN* on such of these stations as have been found to maintain a sufficiently constant frequency to be useful as standards.

As shown by the list of "Constant-frequency stations," there may be many other stations not measured in the bureau's laboratory which maintain their frequencies just as constant as the stations listed below. There is, of course, no actual guaranty that these stations will maintain the constancy shown, but the data indicate the high degree of confidence that can be placed in them. The transmitted frequencies from the standard-frequency stations can be utilized for calibrating frequency meters and other apparatus by the procedure given in Bureau of Standards Letter Circular No. 171, which may be obtained by a person having actual use for it upon application to the Bureau of Standards, Department of Commerce, Washington, D. C.

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Station	Owner	Location	Assigned frequency	Period covered by measurements	Number of times measured	Deviations from assigned frequencies noted in measurements	
						Average	Greatest since Mar. 25, 1927
			Kilocycles	Months		Per cent	Per cent
NBH	United States Navy...	Annapolis, Md.....	¹ 17.60	11	55	0.2	0.4
WCI	Radio Corporation of America.	Tuckerton, N. J.....	¹ 17.95	25	159	.1	.3
WES	Do.....	Rocky Point, N. Y....	18.60	7	27	.1	.2
WGG	Do.....	Tuckerton (No. 1), N. J.	18.65	44	283	.2	.2
WII	Do.....	New Brunswick, N. J.	21.60	24	125	.1	.1
WVA	United States Army...	Annapolis, Md.....	160	25	160	.2	.8
NAA	United States Navy...	Arlington, Va.....	112	15	92	.2	.1
WRAP	National Broadcasting Co.	New York, N. Y.....	690	28	161	.0	.0
WRC	Radio Corporation of America.	Washington, D. C....	640	40	198	.1	.0
WJZ	Do.....	Round Brook, N. J....	690	11	45	.2	.3
NAA	United States Navy...	Washington, D. C....	690	2	7	.1	.1
WGY	General Electric Co....	Schenectady, N. Y....	750	45	205	.1	.0
WBZ	Westinghouse Electric & Manufacturing Co.	Springfield, Mass....	900	31	94	.1	.1
KDKA	Do.....	E. Pittsburgh, Pa....	970	11	49	.1	.2
WBAL	Consolidated Gas, Electric Light & Power Co.	Glen Morris, Md.....	1,220	2	7	.0	.1

¹ Changed to 17.60 kilocycles on Mar. 25.

CONSTANT-FREQUENCY STATIONS

The list of "constant-frequency stations" given below supplements the list of "standard-frequency stations." The transmitted waves from the stations in either list should be of value to the public as frequency standards because of their constancy and close adherence to the licensed values. The Bureau of Standards makes regular measurements of the transmitted frequencies of the standard-frequency stations only. The constant-frequency stations in the following supplementary list do not carry the same assurance of reliability as if the transmitted waves were regularly measured by the Bureau of Standards, but it is probable that if measurement data were available many of them would show the same constancy as the standard-frequency stations.

The fundamental requirement of a broadcasting station for inclusion in the following list is the employment of a special device for controlling or checking the frequency, the calibration of such a device being in agreement with the bureau's frequency standards. The special device may be automatic piezo-control, a piezoscillator, piezoresonator, or frequency indicator. Stations not included in this list nor in the list of standard-frequency stations, which use one of the special devices for frequency regulations, are invited to communicate with the Bureau of Standards requesting a copy of Letter Circular 214, Requirements of Constant-Frequency Stations.

Station	Owner	Location	Fre-	Wave	Apparatus for frequency regulation
			quency	length	
			<i>Kilo-</i>	<i>Meters</i>	
			<i>cycles</i>		
WHO	Bankers Life Co.....	Des Moines, Iowa...	570	526	Piezoscillator.
KPRU	Stephens College.....	Columbia, Mo.....	600	499.7	Frequency indicator and piezoscillator.
WOC	Palmer School of Chiro- practic.....	Davenport, Iowa....	620	483.6	Piezoscillator.
WTIC	Traveler's Insurance Co..	Hartford, Conn.....	630	475.9	Do.
WMAQ	Chicago Daily News.....	Chicago, Ill.....	670	447.5	Frequency indicator, type B, and piezoscillator.
KFO	Hale Bros. and the Chroni- cle.....	San Francisco, Calif.	700	428.3	Frequency indicator.
WLW	Crosley Radio Corpora- tion.....	Harrison, Ohio.....	710	422.3	Frequency indicator and piezoscillator.
WCCO	Washburn-Crosby Co....	St. Paul-Minncap- olis, Minn.....	720	416.4	Piezoscillator.
WTAM	Willard Storage Battery	Cleveland, Ohio....	770	389.4	Do.
WEAR	Co.....				
KTHS	New Arlington Hotel Co..	Hot Springs, Ark....	800	374.8	Frequency indicator, type B.
WJJD	Loyal Order of Moose....	Mooseheart, Ill.....	810	370.2	Piezoscillator.
KGO	General Electric Co.....	Oakland, Calif.....	830	361.2	Automatic piezo control and piezoscillator.
WJAD	Frank P. Jackson.....	Waco, Tex.....	850	352.7	Frequency indicator, type B.
WWJ	Detroit News.....	Detroit, Mich.....	850	352.7	Do.
WLS	Bears, Roebuck & Co....	Croto, Ill.....	870	344.6	Piezoscillator.
KFAB	Nebraska Bulek Motor Co.....	Lincoln, Nebr.....	880	340.7	Frequency indicator, type B.
WEAQ	Radio Corporation of Puerto Rico.....	San Juan, P. R.....	880	340.7	Do.
KOA	General Electric Co.....	Denver, Colo.....	920	322.4	Piezoscillator.
WEAO	Ohio State University....	Columbus, Ohio....	1,020	293.9	Frequency indicator, type B.
WMBI	Moody Bible Institute of Chicago.....	Chicago, Ill.....	1,040	288.3	Piezoscillator.
WFBO	William F. Gable Co.....	Altoona, Pa.....	1,080	277.6	Frequency indicator.
KFKA	Colorado State Teachers' College.....	Greeley, Colo.....	1,100	272.6	Piezoscillator.
WBAA	Purdue University.....	West Lafayette, Ind.	1,100	272.6	Do.
WOI	Iowa State College.....	Ames, Iowa.....	1,110	270.1	Automatic piezo control (checked with type B frequency indicator).
KPH	Hotel Lassen.....	Wichita, Kans.....	1,120	267.7	Frequency indicator, type B.
WCAD	St. Lawrence University..	Canton, N. Y.....	1,140	263	Frequency indicator.
WAAM	I. R. Nelson.....	Newark, N. J.....	1,140	263	Piezoscillator.
KWUC	Western Union College..	Le Mars, Iowa....	1,190	257	Do.
WOWO	Main Auto Supply Co....	Fort Wayne, Ind....	1,320	227.1	Do.
WBBM	Atlas Investment Co....	Chicago, Ill.....	1,330	225.4	Do.
WEBQ	Tate Radio Co.....	Harrisburg, Ill....	1,330	225.4	Piezoscillator, Type N.
KFVS	Hirsch Battery & Radio Co.....	Capo Girardeau, Mo.	1,340	223.7	Frequency indicator, type B.
WPDQ	Hiram L. Turner.....	Buffalo, N. Y.....	1,460	205.4	Do.

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 Bureau of Standards. The various periodicals can be consulted at large public libraries.

R000.—Radio communication

- R007.1 The radio act of 1927 (60th Cong. passes act greatly needed by radio industry). Radio News, 8, p. 1318, May, 1927.
- R007.1 The new radio law. QST, 11, pp. 39-44, April, 1927.
- R020 Blake, G. O. History of radio telegraphy and radio telephony (book). Published by the Radio Press (Ltd.), 1925; price 25 shillings. Abstracted in Wireless World and Radio Rev., 23, pp. 446, April 13, 1927.
- R000 Chaffee, E. L. Vacuum tube nomenclature (discussion on pp. 253-54 of this issue). Proc. Inst.

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R100.—Radio principles

- R100 Brown, O. F. The elements of radio communication (book). Oxford University Press, 1927, price 10 shillings 6 pence. Abstracted in Experimental Wireless (London), 4, p. 212, April, 1927.
- R100 Rados, C. W. Radio translated for the experimenter. QST, 11, pp. 9-12, April, 1927.
- R112.1 deBelliscira, H. Dispositif permettant les sélections du fading—applications et conséquences. L'Onde Electrique, 4, pp. 116-119, March, 1927.
- R113.5 Jelstrup, H. Au sujet de l'aurore du 15 Octobre observée en Norvège. L'Onde Electrique, 4, pp. 132-134, March, 1927.
- R113.6 McPetrie, J., and Willmote, R. Refraction of electromagnetic waves round the earth's surface. Nature, p. 318, February 29, 1927. Abstracted in Experimental Wireless (London), p. 244, April, 1927.
- R113.7 Klebits, F. Les limites de ma théorie de propagation. L'Onde Electrique, 4, pp. 127-131, March, 1927.
- R113.7 Metz, Cornu. Les ondes courtes. Revista Telegrafica, 11, pp. 199-204, March, 1927.
- R114 Nakagami, T., and Kuroko, K. Observations on the atmospheric disturbances. Jour. I. E. E. of Japan, pp. 1423-36, December, 1926. Abstracted in Experimental Wireless (London), p. 244, April, 1927.
- R114 Bäumlcr, M. Gleichzeitige Luftstörungen in der drahtlosen Telegraphie. Jahrbuch der drahtlosen Telegraphie, 23, pp. 52-56, February, 1927.
- R114 Bureau, R.; Viant, A.; and Gret, A. Un Enregistreur de la Fréquence des atmosphériques: Son utilisation en météorologie. Comptes Rendus, 184, pp. 157-58, January, 1927. Abstracted in Experimental Wireless (London), p. 244, April, 1927.
- R114 Ennis, E. The dweller on the threshold: A compilation of observations on the relationship between static and the weather. Radio (San Francisco), 8, p. 14, April, 1927.
- R120 Rinneweg, A. Some suggested aerial installations. Radio News, 5, p. 1356, May, 1927.
- R125.1 Rados, C. W. Radio aids to navigation (direction finding). Radio News, 5, p. 1316, May, 1927.
- R125.1 Fischer, F. Über die vom schiff hervorgerufene Funkwellenleitung und ihre Beseitigung. Zeits. f. Techn. Physik, pp. 460-62, 1926. Abstracted in Experimental Wireless (London), p. 246, April, 1927.
- R125.1 de la Forge, L. Radiogoniométrie météorologique. QST Français et Radioélectrique Réunion, 8, pp. 56-62, March, 1927.
- R127 Discussion on radiation resistance of a vertical antenna. Proc. Inst. of Radio Engrs., 15, pp. 245-247, March, 1927.
- R127 Griffiths, W. H. F. The resultant capacity of serial systems employing series tuning condensers. Experimental Wireless (London), 4, pp. 208-212, April, 1927.
- R131 Henny, K. Methods of measuring tube characteristics. Radio Broadcast, 11, pp. 45-50, May, 1927.
- R132 Hatry, L. W. Which is the detector? QST, 11, pp. 17-19, April, 1927.
- R134.75 Grebe, A. H. Radio receiving apparatus (superheterodyne) United States Patent No. 1623918, issued April 5, 1927.
- R136 Anderson, J. E. Influence on the amplification of a common impedance in the plate circuits of amplifiers. Proc. Inst. of Radio Engrs., 15, pp. 195-212, March, 1927.
- R136 Hartshorn, L. The input impedances of thyratron valves at low frequencies. Proc. Phys. Soc. (London), 33, pp. 108-123, February 15, 1927.
- R144 Mallett, E., and Blumlein, A. D. A new method of high-frequency resistance measurement. J. I. E. E. (London), pp. 397-414, 1923. Abstracted in Jahrbuch der drahtlosen Telegraphie, pp. 56-58, February, 1927.
- R144 Had, E. L. Resistance of conductors of various types and sizes as windings of single-layer coils at 150 to 6,000 kilocycles (Bureau of Standards Technology Paper No. 330). Abstracted in Radiofax, 17, pp. 17-20, April, 1927.
- R171 Reed, O. P. Radio interference experiences. Electrical West, 28, pp. 195-197, April, 1927.
- R171 Ellsworth, H. E. Location of radio interference. Electrical World, 89, pp. 810-811, April 16, 1927.

R200.—Radio measurements and standardization

- R201.2 Roschke, E. Vacuum tube measuring instruments. E. T. Z., February, 1927. Abstracted in Electrical World, 89, p. 821, April 16, 1927.
- R210 Burke, C. T. How to calibrate a wave meter: A method employed for quartz crystal primary standard, secondary standards, and standard frequency transmissions. Radio (San Francisco), 9, pp. 29-30, April, 1927.
- R230 Cooper, P. A. A new loss measuring device and its application to high-frequency measurements (for capacity). Phil. Mag. (London), 3, pp. 695-33, March, 1927.
- H240 Handy chart for figuring parallel resistances, inductances, and series capacities. Radio (San Francisco), 8, p. 22, April, 1927.
- H251.2 Chromy, B. J. A sensitive thermocouple. QST, 11, pp. 31-32, April, 1927.
- H251 Shen, R. F. The most useful meter (as an electron tube voltmeter, etc.). QST, 11, pp. 47-53, April, 1927.

R300.—Radio apparatus and equipment

- R320.8 Miller, H. P. The insulation of a guyed mast. Proc. Inst. of Radio Engrs., 15, pp. 225-243, March, 1927.
- H228 Espenschied, L. Multiple antenna system for radiocommunication. United States Patent No. 1622870, issued March 29, 1927.
- R329 Clark, G. H. Radio signaling system. United States Patent No. 1624215, issued April 12, 1927.
- R330 The UX-852, 75-watt short wave amateur transmitting radiotron. Radiofax, 17, pp. 9-12, April, 1927.
- R330 Kruse, R. S. Radiotron OX-340—UX-240. QST, 11, pp. 29-30, April, 1927.
- R331 Gracie, J. J. Modern valve manufacture. Wireless World and Radio Review, 23, pp. 405-413, April 6, 1927.
- R342 Discussion on the "Output of characteristics of amplifier tubes." Proc. Inst. of Radio Engrs., 15, pp. 219-251, March, 1927.
- R342.15 Redfern, F. P. Radio frequency transformers—various simple considerations affecting their design and operation in vacuum tube amplifiers. Radio (San Francisco), 8, pp. 19-20, April, 1927.
- R342.2 Kasten, H. Ein Beitrag zur Theorie der Niederfrequenzverstärkung mit Widerstandkopplung. Jahrbuch der drahtlosen Telegraphie, 23, pp. 32-46, Feb., 1927.
- R342.2 Colebrook, F. M. A new development in resistance amplification. Experimental Wireless

- R343 Jones, F. C. A balanced short-wave receiver (nonradiating). Radio Broadcast, 11, pp. 34-35, May, 1927.
- R343.7 Deurs, R. F. Filament lighting from the a. c. mains. Radio Broadcast, 11, pp. 33-35, May, 1927.
- R343.7 Lovejoy, D. R. Combined A battery trickle charger and B supply. United States Patent No. 1624028, issued April 5, 1927.
- R344 Taylor, L. S. Intermittent valve oscillator. Jour. Frank. Inst., 261, pp. 351-54, March, 1927.
- R344.3 Rowe, G. C. D. Below 30 meters with helparts. Radio News, 8, p. 1329, May, 1927.
- R347 Oson, M. and Kasarnowsky, L. Method of wireless signaling. United States Patent No. 1624005, issued April 12, 1927.
- R357 Oson, M. Frequency changer for short waves. United States Patent No. 1624055, issued April 12, 1927.
- R357 Oson, M. Circuit arrangement for high-frequency sending stations. United States Patent No. 1624009, issued April 12, 1927.
- R373.1 Hahnemann, W.; Hecht, H.; Lichte, and Adelmann. Vibration amplifier. United States Patent No. 1623507, issued March 29, 1927.
- R376.3 Melaschlan, N. W. Loudspeaker diaphragm. Wireless World and Radio Review, 20, pp. 345-350, March 23, 1927.
- R377 Agate, C. S. and Williams, P. W. Radiosignaling. United States Patent No. 1624201, issued April 12, 1927.
- R377.6 Vernam, G. S. Radio printing telegraph system. United States Patent No. 1622117, issued March 29, 1927.
- R381 Leuck, L. P. Electrolytic filter condenser. QST, 11, pp. 55-57, April, 1927.
- R382 Young, A. M. and Simpson, N. W. Radio apparatus. United States Patent No. 1624152, issued April 3, 1927.
- R382 Gunn, R. Some facts about coil design. Radio Broadcast, 11, pp. 40-42, May, 1927.
- R383.5 Schubert, G. Grundlegendes zu Untersuchungen an Mikrophanen. Elektrische Nachrichten Technik, 4, pp. 129-134, 1927.

R400.—Radio-communication systems

- R402 Eckersley, T. L. Short-wave wireless telegraphy. Experimental Wireless (London), 4, pp. 213-222, April, 1927.
- R426 Powell, R. L. Signal-receiving circuits. United States Patent No. 1624148, issued April 12, 1927.
- R431 Harris, S. Ways of reducing interference. Radio News, 8, pp. 1336-37, May, 1927.
- R433 Jammet, J. Note sur un système de communications électriques secrètes. L'Onde Electrique, 4, pp. 135-136, March, 1927.
- R450 O'Neill, H. W. Communication system. United States Patent No. 1624072, issued April 12, 1927.
- R460 Clement, L. M. High-frequency signaling system. United States Patent No. 1624473, issued April 12, 1927.
- R460 Adams, W. J., and Haddock, A. Shielding and balancing. United States Patent No. 1624459, issued April 12, 1927.
- R469 Venus, M. Telegraphie et téléphonie multiplex sur ondes courtes. L'Onde Electrique, 4, pp. 129-130, March, 1927.

R500.—Applications of radio

- R590 Le Marguand, H. La T. S. F. et les routes de l'air (stations along air routes). QST Français et Radioelectricite Reunis, 5, pp. 69-72, March, 1927.
- R621.1 La direction des avions par T. S. F. La Nature (France), pp. 270-272, March 15, 1927.
- R621.1 La radiogoniometrie et la navigation. L'Aerophile, 46, pp. 45-48, February, 1927.
- R680 Martin, DeK. L.; Oillet, G. D.; Bemis, I. S. Some possibilities and limitations in common frequency broadcasting. Proc. Inst. of Radio Engrs., 15, pp. 213-223, March, 1927.
- R682 Baird, J. L. Television. Journal Scientific Instruments (London), 4, pp. 138-142, February, 1927.
- R682 Phototelegraphy. Experimental Wireless (London), 4, pp. 229-233, April, 1927.
- R682 Television. Experimental Wireless (London), 4, pp. 229-240, April, 1927.

R900.—Nonradio subjects

- 134 Meyer, E. Beitrag zur Untersuchung des Nachhalls. Elektrische Nachrichten Technik, 4, pp. 135-136, 1927.
- 624.53 Horton, J. W. Submarine signaling. United States Patent No. 1624412, issued April 12, 1927.
- 621.813.7 Kruse, R. S. Developments in dry electrolytic rectifiers. QST, 11, pp. 34-38, April, 1927.
- 621.383.21 Bell, H. Microphonic relay. United States Patent No. 1624511, issued April 12, 1927.
- 621.385 Crisson, G., and Silent, H. O. Multiray connection (telephony). United States Patent No. 1623995, issued April 5, 1927.

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