RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE.

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CONTENTS.

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.
G. 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:
PG=General public.
PR=Limited public.
P =Private.
O =Government business exclusively.
Hours =Hours of operation.
N =Continuous service.
X =No regular hours.
m =a. m. (12 m=midday).
s =p. m. (12s=midnight).
Rates =Ship or coast charges in cents: c=cents. (The rates in the international list are given in francs and centimes.)
I. W. T. Co. =Independent Wireless Telegraph Co.
R. C. of A. =Radio Corporation of America.
S. O. R. S. =Ship Owners' Radio Service.
Co. =Company.
Corp. =Corporation.
& =And.
Do. =Ditto.
C. w. =Continuous wave.
V. t. =Vacuum tube.
FX. =Fixed station.

CERTIFICATE.

By direction of the Secretary of Commerce this publication is issued as an administrative report and is required for the proper transaction of the public business.

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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, 1921, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Camp 61-C [1]	KFM	540	PR (FX)	X	Southern California Edison Co.
Chicago, Ill. [2]	WRU	360, 420	PR (FX)	X	City of Chicago.
Cleveland, Ohio [3]	WHK	360	PR (FX)	X	Warren R. Cox.
Dayton, Ohio [4]	WFO	360, 485	PR (FX)	X	Rike Kumler Co.
East Lansing, Mich. [5]	WHW	485	PR (FX)	X	Stuart W. Seeley, U. S. Weather Bureau.
Gridley, Calif. [6]	KPU	360	PR (FX)	X	The Precision Shop.
Hamilton, Ohio [7]	WHK	360	PR (FX)	X	Doron Brothers Electric Co.
Indianapolis, Ind. [8]	WGH	360	PR (FX)	X	Hatfield Electric Co.
Jefferson City, Mo. [9]	WOS	485	PR (FX)	X	Missouri State Marketing Bureau.
Kansas City, Mo. [10]	WOQ	360, 485	PR (FX)	X	Western Radio Co.
Medford Hillside, Mass. [11]	WGI	360	PR (FX)	X	American Radio & Research Corp.
Montgomery, Ala. [12]	WGH	360	PR (FX)	X	Montgomery Light & Power Co.
Newark, N. J. [13]	WOR	360	PR (FX)	X	L. Bamberger & Co.
New London, Conn. [14]	WST	300, 450, 600	PG	N	I. W. T. Co.
New York, N. Y. [15]	WCG	300, 475, 600	PG	N	Do.
Philadelphia, Pa. [16]	WIL	250, 360	PR (FX)	X	Thomas F. J. Hewlett.
Pine Bluff, Ark. [17]	WOK	360, 510	PR (FX)	X	Pine Bluff Co.
Pomona, Calif. [18]	KOF	360	PR (FX)	X	Pomona Fixture & Wiring Co.
Richmond, Ind. [19]	WOZ	360, 485	PR (FX)	X	Palladium Printing Co.
Rochester, N. Y. [20]	WHG	360, 485	PR (FX)	X	Rochester Times Union.
Rock Island, Ill. [21]	WOQ	360, 485	PR (FX)	X	Kurlowa Radio Co.
San Francisco, Calif. [22]	KTO	360	PR (FX)	X	Examiner Printing Co.
Seattle, Wash. [23]	KHQ	360	PR (FX)	X	Louis Wasmer.
Schenectady, N. Y. [24]	WGY	360	PR (FX)	X	General Electric Co.
Springfield, Ohio [25]	WNA	485	PR (FX)	X	Ford Motor Co.
Toledo, Ohio [26]	WHT	360	PR (FX)	X	William R. Dusk Co.
Toledo, Ohio [27]	WJK	360	PR (FX)	X	Service Radio Equipment Co.

[1] Loc. 0.139° 03' 00", N. 37° 18' 30"; range, 50; system, De Forest (v. t. telegraph); rate, none.
[2] Loc. 0.87° 37' 20", N. 41° 52' 25"; range, 300; system, De Forest (c. w.); rate, none.
[3] Loc. (approximately) 0.81° 42' 30", N. 41° 30' 00"; range, 50; system, composite (v. t. telephone); rate, none.
[4] Range, 300; system, composite (v. t. telephone); rate, none.
[5] Loc. (approximately) 0.81° 26' 00", N. 42° 44' 00"; system, composite (v. t. telephone); rate, none.
[6] Loc. 0.121° 41' 00", N. 39° 21' 45"; range, 20; system, composite (v. t. telephone); rate, none.
[7] Range, 100; system, composite (v. t. telephone); rate, none.
[8] Loc. 0.92° 13' 21", N. 39° 34' 44"; range, 100; system, composite (v. t. telephone); rate, none.
[9] Loc. (approximately) 0.91° 37' 00", N. 38° 35' 00"; system, composite (v. t. telephone and telegraph); rate, none.
[10] Loc. 0.71° 07' 45", N. 42° 22' 45"; range, 200; system, composite (v. t. telephone); rate, none.
[11] Loc. (approximately) 0.86° 14' 00", N. 32° 23' 00"; range, 150; system, composite (v. t. telephone); rate, none.
[12] System, De Forest (v. t. telephone); rate, none.
[13] Loc. (approximately) 0.72° 00' 00", N. 41° 10' 00"; range, 230; system, composite, 240; rate, ship service 10 c. per word, except vessels plying on Long Island Sound, the rate for which is 3 c. per word.
[14] Loc. 0.74° 00' 25", N. 40° 42' 45"; range, 300; system, Marconi-Telefunken, 450; rate, ship service 10 c. per word, except vessels plying on Long Island Sound, the rate for which is 3 c. per word.
[15] Loc. (approximately) 0.73° 08' 00", N. 39° 57' 00"; range, 100; system, composite (v. t. telephone and telegraph) and composite, spark 128; rate, none.
[16] Range, 50; system, De Forest (v. t. telephone and telegraph); rate, none.
[17] Loc. (approximately) 0.41° 00' 00", N. 34° 09' 00"; system, composite, (v. t. telephone); rate, none.
[18] Loc. 0.77° 36' 08", N. 43° 09' 24"; system, De Forest (v. t. telephone); rate, none.
[19] Loc. (approximately) 0.90 39' 00", N. 41° 40' 00"; range, 200; system, composite (v. t. telephone) and composite, spark; rate, none.
[20] Loc. 0.122° 22' 15", N. 47° 38' 37"; system, composite (v. t. telephone); rate, none.
[21] Loc. 0.73° 54' 30", N. 42° 50' 00"; range, 250; system, composite (v. t. telephone); rate, none.
[22] Range, 300; system, composite (v. t. telephone and telegraph); rate, none.
[23] Range, 200; system, composite (v. t. telephone); rate, none.

NOTE.—Stations having a wave length of 360 meters transmit news, concerts, etc., and those having a wave length of 485 meters transmit market and weather reports.

Commercial ship stations, alphabetically by names of vessels.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921, 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—
		North and South American service.	Transoceanic service.				
		Cents.	*Cents.*				
Allen	KDXC					Dennis Sullivan	
Bethore	KDWW	8	8	PG	X	Ore S. S. Co.	R. C. of A.
Cathay	KDWX	8	8	PG	X	U. S. Shipping Board.	
Federal	KDWY			PG	X	American Petroleum Co.	
Fidus	KDXB					Frank J. Kelly	
Fort McHenry	KDXA						
Portuna [1]	KDWU			PR	X	Richmond Talbot	Owner of vessel.
Pan America	KDWZ	8	8	PG	N	U. S. Shipping Board.	
Wasagya	KOPN	8	8	PG	X	do	R. C. of A.
Yankton	KDWT			PG	X	Alexander A. Tunes	

[1] Range, 150; system, composite (w. t. telephone and telegraph); w. l., 300, 450, 600.

Commercial land and ship stations, alphabetically by call signals.

[b—ship station; c—land station.]

Call signal.	Name.		Call signal.	Name.	
KDWT	Yankton	b	WGI	Medford Hillside, Mass	c
KDWU	Portuna	b	WGL	Philadelphia, Pa	c
KDWW	Bethore	b	WHK	Cleveland, Ohio	c
KDWX	Cathay	b	WHW	East Lansing, Mich	c
KDWY	Federal	b	WJK	Toledo, Ohio	c
KDWZ	Pan America	b	WOQ	Kansas City, Mo	c
KDXA	Fort McHenry	b	WOY	Schenectady, N. Y	c
KDXB	Fidus	b	WHQ	Rochester, N. Y	c
KDXC	Allen	b	WHU	Toledo, Ohio	c
KOPN	Wasagya	b	WNA	Springfield, Ohio	c
KFM	Camp 94-C	c	WOC	Rock Island, Ill	c
KFU	Gridley, Calif	c	WOH	Indianapolis, Ind	c
KGF	Pomona, Calif	c	WOK	Pine Bluff, Ark	c
KHQ	Seattle, Wash	c	WOR	Newark, N. J	c
KUO	San Francisco, Calif	c	WOS	Jefferson City, Mo	c
WBU	Chicago, Ill	c	WOZ	Richmond, Ind	c
WCQ	New York, N. Y	c	WRK	Hamilton, Ohio	c
WFO	Dayton, Ohio	c	WST	New London, Conn	c
WGH	Montgomery, Ala	c			

Government ship stations, alphabetically by names of stations.

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Station.	Call signal.	Station controlled by—
Commodore	NLR	U. S. Navy.
Tamaroa	NIVR	U. S. Coast Guard.
West Lesark	WXD	U. S. Army.

Special land stations, alphabetically by names of stations.

[Additions to the List of Radio Stations of the United States, edition of June 30, 1921.]

Station.	Call signal.	Wave lengths.	Station controlled by—
Alameda, Calif.	6XA	Variable.	H. H. Hyder, 1304 Versailles Street.
Birmingham, Ala.	5XC	200 to 375.	Alabama Power Co.
Birmingham, Ala.	5ZI	200, 375.	John M. Wilder, 1311 North Fourteenth Street.
Brookline, Mass.	1XA	150 to 250.	James C. Ramsey, 369 Tappan Street.
Cincinnati, Ohio.	8ZH	200, 375.	Cino Radio Mfg. Co., 219 West Twelfth Street.
College Station, Tex.	5ZP	200, 375.	Ralph E. Smith.
Corvallis, Oreg.	7XH	Variable.	Oregon Agricultural College.
East Cleveland, Ohio.	8YD	200, 375.	Shaw Technical School.
Enid, Okla.	5ZM	200, 375.	Charles E. Whartenby.
Fort Riley, Kans.	9ZE	200, 375.	Frank M. Endo (Major).
Greenwich, Conn.	1XB	Variable.	Minton Crumkhite.
Hyattsville, Md.	3XR	Variable.	J. Harris Rogers.
Los Angeles, Calif.	6XB	Variable.	H. H. Hyder, 1106 West Second Street.
Monroe, Wis.	9XA	Variable.	United Telephone Co.
Norman, Okla.	5ZG	200, 375.	Maurice L. Prescott.
Oakland, Calif.	6XC	Variable.	Atlantic-Pacific Radio Supplies Co., 5001 Ocean View Drive.
Oakland, Calif.	6ZI	200, 375.	R. S. Rheem, 478 Orchard Street.
Phoenix, Ariz.	6ZD	200, 375.	Robert M. Willmoth & Harschel Rawls.
Ponca City, Okla.	5ZQ	200, 375.	William H. England, jr.
Portland, Oreg.	7XG	200, 375.	Willard F. Hawley, jr., 400 East Twenty-second Street.
Reedley, Calif.	6ZF	200, 375.	William W. Lindsay, P. O. Box 643.
Sioux City, Iowa.	9ZF	200, 375.	Sioux City Radio Laboratory.
Swissvale, Pa.	8ZE	200, 375.	Clarence T. Hewitt, 7942 Westmoreland Avenue.
Victoria, Tex.	5YA	200, 375.	Patti Wilder High School.

Special land stations, grouped by districts.

Call signal.	District and station.
	First district:
1XA	Brookline, Mass.
1XB	Greenwich, Conn.
3XR	Third district: Hyattsville, Md.
	Fifth district:
5XC	Birmingham, Ala.
5YA	Victoria, Tex.
5ZG	Norman, Okla.
5ZI	Birmingham, Ala.
5ZM	Enid, Okla.
5ZP	College Station, Tex.
5ZQ	Ponca City, Okla.
	Sixth district:
6XA	Alameda, Calif.
6XB	Los Angeles, Calif.
6XC	Oakland, Calif.
	Sixth district—Continued.
6ZD	Phoenix, Ariz.
6ZF	Reedley, Calif.
6ZI	Oakland, Calif.
	Seventh district:
7XG	Portland, Oreg.
7XH	Corvallis, Oreg.
	Eighth district:
8YD	East Cleveland, Ohio.
8ZE	Swissvale, Pa.
8ZH	Cincinnati, Ohio.
	Ninth district:
9XA	Monroe, Wis.
9ZE	Fort Riley, Kans.
9ZF	Sioux City, Iowa.

ALTERATIONS AND CORRECTIONS.

COMMERCIAL LAND STATIONS.

BAKERSFIELD, CALIF. (KDNT).—Strike out all particulars.

BAKERSFIELD, CALIF. (WJT).—Strike out all particulars.

CAMP 80, CALIF.—System, De Forest (v. t. telephone and telegraph); w. l., 527.

CASCADE, CALIF.—System, De Forest (v. t. telephone and telegraph); w. l., 527.

DETROIT, MICH. (WBL).—Loc. 0.83° 15′ 03″, N. 42° 19′ 40″.

EAST HAMPTON, N. Y.—Range, 900; system, Cutting & Washington, 480; w. l., strike out 1800 meters.

EAST PITTSBURGH, PA.—W. l., 580, 500, 3200.

FRESNO, CALIF.—Strike out all particulars.

NEW ORLEANS, LA. (WNU).—Range, 1500; w. l., 300, *600*, 1700, 2850; rates, insert *Almirante, Panama for Bocas del Toro, Panama, all points in British Honduras* 36 c. per word.

NEWPORT, R. I.—Strike out all particulars.

NEW YORK, N. Y. (WNY).—Loc. 0.74° 00′ 05″, N. 40° 39′ 30″.

NEW YORK, N. Y. (WSE).—Range, 600; w. l., 300, 600, 1800; rates, ship to shore service 10 c. per word, ships operating on Long Island Sound 3 c. per word.

NORFOLK, VA.—Range, 200; system, Navy-Marconi, 1000.

PORT CHATHAM, ALASKA.—Strike out all particulars.

TAFT, CALIF.—Strike out all particulars.

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, 1923, and to the International List of *Radiotelegraph* Stations, published by the Berne bureau.]

ABERCON.—A. H. Bull S. S. Co. owner of vessel; station operated and controlled by I. W. T. Co.

AGEMEMNON.—Strike out all particulars.

ANTINOUS.—U. S. Shipping Board owner of vessel.

APUS.—U. S. Shipping Board owner of vessel.

ASTREA.—Strike out all particulars.

ATLANTIC SUN.—Sun Co. owner of vessel.

BARRANCA.—Bisso Towboat Co. owner of vessel.

BARTOLOME.—Cuban Atlantic Transportation Co. owner of vessel.

BASFORD.—France & Canada Oil Transport Corp. owner of vessel.

BASCONEL.—France & Canada Oil Transport Corp. owner of vessel.

BATHGATE.—Southern Transportation Co. owner of vessel.

BATINO.—Strike out all particulars.

BATON ROUGE (KDVX).—Inland & Coastwise Waterways Service (Mississippi-Warrior Service) owner of vessel.

BAYFORT.—National Oil Transport Co. owner of vessel.

BEARPORT.—Station operated and controlled by I. W. T. Co.

BELLINGHAM.—System, Navy-R. C. of A., 1000; w. l., 300, 450, *600*.

BELVIDERE.—System, Navy-R. C. of A., 1000; w. l., 300, 450, *600;* hours, X.

BIRCHLEAF.—Strike out all particulars.

BOSTON (KXA).—Range, 75; system, Fessenden, 260.

BOWDOIN.—McMillan Arctic Association owner of vessel.

BRAVE COEUR.—W. l., 300, 450, *600*.

BUCCANEER.—System, R. C. of A., 1000; w. l., 300, 450, *600;* Sinclair Navigation Co. owner of vessel.

BYRON D. BENSON.—Tidewater Oil Co., owner of vessel.

CALORIA.—Sytem, R. C. of A., 1000; w. l., 300, 450, *600*.

CAROLINIAN.—Range, 150; system, R. C. of A., 1000; w. l., 300, 450, *600*.

CASPER.—Range, 300; w. l., 300, 450, *600*.

CAIRO.—Inland & Coastwise Waterways Service (Mississippi-Warrior service), owner of vessel.

CARIB (KUZX).—George F. Silva (care of William T. Higgins, 100 Varick Street, New York, N. Y.), owner of vessel; station operated and controlled by owner of vessel.

CENTAURUS.—System, R. C. of A., 480; Green Star S. S. Corp., owner of vessel.

CEROSCO.—System, Navy-R. C. of A., 1000; w. l., 300, 450, *600*.

CHINA.—China Mail S. S. Corp., owner of vessel.

CHINCHA.—System, R. C. of A., 1000; hours, X.

CLAIRTON.—System, Navy-R. C. of A., 1000; hours, X.

CLARKSBURG.—Name changed to Georgian.
CLEMENT SMITH.—Oil Transport Co., owner of vessel.
CLINCHO.—System, Navy-Simon, 1000; Clinchfield Navigation Co., owner of vessel.
COASTWISE.—Strike out all particulars.
COLONIAL.—Western Reserve Transportation Co., owner of vessel.
COWARDIN.—U. S. Shipping Board, owner of vessel.
CRAFTSMAN.—M. J. Dady Engineering & Contracting Co., owner of vessel.
CUSTODIAN.—Pringle Barge Line Co., owner of vessel.
DALLAS.—System, Navy-R. C. of A., 1000; w. l., 300, 450, *600;* hours, X.
DAVENPORT.—U. S. Shipping Board, owner of vessel.
DEERFIELD.—System, Navy, 1000; hours, X; rate; North and South American and transoceanic services, 8 c. per word.
DERBYLINE.—System, Navy-Lowenstein, 1000; w. l., 300, 450, *600.*
DEWEY (KDNF).—Andrew Olson, owner of vessel.
DOCHRA.—La Plata S. S. Co., owner of vessel.
DORA.—Strike out all particulars.
DUQUESNE.—System, Navy-R. C. of A., 1000; w. l., 300, 450, *600;* hours, X.
EASTERN GLADE.—System, Federal arc; w. l., 300, *600*, 1800; hours, X.
EASTERN STAR.—U. S. Shipping Board, owner of vessel.
EASTERN SUN.—Range, 300; system, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, *600.*
EDMORE.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, *600.*
EFFINGHAM.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 450, *600.*
ELMAC.—Name changed to Surinam.
EMPIRE ARROW.—Range, 300; system, R. C. of A., 1000; w. l., 300, *600.*
EUBANA.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, *600.*
FIRMORE.—Guaranty Trust Co., owner of vessel.
FLUOR SPAR.—System, Navy, 1000; w. l., 300, 450, *600.*
FORDONIAN.—Range, 150; system, R. C. of A., 1000.
FOREST KING.—Station operated and controlled by owner of vessel.
GDANSK.—Walter A. Rush, owner of vessel.
GRATIA.—Braddock Navigation Co., owner of vessel.
GREAT FALLS (KUFK).—Name changed to Haiti.
GRIFFDU.—Universal S. S. & Barge Co., owner of vessel.
GULFPORT.—Sinclair Navigation Co., owner of vessel.
HAMMAC.—U. S. Shipping Board, owner of vessel.
HARTWOOD.—Hart-Wood Lumber Co., owner of vessel.
HOG ISLAND.—System, R. C. of A., 1000.
HUMBOLDT.—Strike out all particulars.
INDEPENDENCE.—System, Navy, 1000; w. l., 300, 450, *600;* hours, X.
INVADER.—Station operated and controlled by R. C. of A.
JACOX.—System, Navy-Kilbourne & Clark, 1000; w. l., 300, 400, *600.*
JADDEN.—W. l., 300, 450, *600;* station operated and controlled by R. C. of A.
JANELAW.—Correct orthography Janelew.
KENTUCKIAN.—W. l., 300, 450, *600.*
KOSCIUSZKO.—Polish-American Navigation Corp., owner of vessel.
LAFOOMO.—System, Navy-W. S. A. Co., 1000; w. l., 300, 450, *600.*
LAKE ELON.—W. l., 300, 450, *600.*
LAKE ELRIO.—Name changed to Paria.
LAKE FACKLER.—Name changed to Bolivar.
LAKE FAIRLIE.—System, Navy-Marconi, 1000; w. l., 300, 450, *600.*
LAKE FALAMA.—Station operated and controlled by I. W. T. Co.
LAKE FARISTON.—Name changed to Baracoa.
LAKE FARRAR.—System, Navy-W. S. A. Co., 1000.

LAKE FILLMORE.—Named changed to Bridgetown.
LEVANT ARROW.—Range, 300; system, R. C. of A., 1000; w. l., 300, *600*.
LOLOMI.—Rodman Wanamaker owner of vessel; station operated and controlled by owner of vessel.
LONE STAR STATE.—Station operated and controlled by S. O. R. S.
MAIDEN CREEK.—W. L., 300, 450, *600*.
MANITOU.—Michigan Transportation Co. owner of vessel.
MAQUAN.—System, Federal arc, 1000 with chopper; w. l., 300, *600*, 1800.
MAUDE F.—Correct orthography Maud F.
MEMPHIS.—Inland & Coastwise Waterways Service (Mississippi-Warrior Service) owner of vessel.
MEXICO.—Range, 300.
MISSOURI.—Michigan Transportation Co. owner of vessel.
MONTAGUE.—System, Navy-Kilbourne & Clark, 1000; w. L., 300, 450, *600*.
MOOSITAUKE.—Correct orthography Moositauke.
MORRISTOWN.—Station operated and controlled by R. C. of A.
MOUNT SEWARD.—American Ship & Commerce Navigation Corp. owner of vessel.
MUNAIRES.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, *600*.
MUNALBRO.—Range, 300; w. l., 300, 450, *600;* Munalbro S. S. Corp. owner of vessel.
MUNARGO.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, *600;* rate, North & South American and transoceanic services 8 c. per word.
MUNINDIES.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, *600*.
MUNSUMO.—Range, 150.
MUSKEGON.—Muskegon S. S. Corp. owner of vessel.
NATCHEZ.—Inland & Coastwise Waterways Service (Mississippi-Warrior Service) owner of vessel.
NATIRAR.—System, Federal arc, 1000 with chopper.
NEPTUNE.—Neptune Line owner of vessel.
NEVADA II.—Correct orthography Nedeva II.
NORA.—W. l., 300, 450, *600*.
NORLINA.—System, R. C. of A., 1000; w. l., 300, 450, *600*.
O. A. HERMANSON.—Sunset Fuel Oil Co. owner of vessel.
OCONEE.—Name changed to Commercial Pilot.
ONECO.—Strike out all particulars.
ORIZABA.—New York & Cuba Mail S. S. Co. owner of vessel.
PEARLDON.—Range, 300; system, Navy, 1000; w. l., 300, 450, *600;* rate, North & South American and transoceanic services 4 c. per word.
PEQUONNOCK.—System, Fessenden-R. C. of A., 260.
PHILIP PUBLICKER.—Waterfront Service Co. owner of vessel.
PIONEER (KUSL).—Stuart Packing Co. owner of vessel.
PLAYA.—Range, 300; system, R. C. of A., 1000; w. l., 300, *600*.
POCAHONTAS.—U. S. Shipping Board, owner of vessel.
PULWICO.—Name changed to Martinique.
PYRAMUS.—Strike out all particulars.
QUINAULT.—Hart-Wood Lumber Co., owner of vessel.
RESTORER.—System, R. C. of A., 1000.
RICHMOND (KDOQ).—I. H. Aiken Transportation & Towing Co., owner of vessel.
RICHMOND (WTR).—R. C. of A., 1000.
RIFFLE.—A. J. McAllister, owner of vessel.
ROBIN GOODFELLOW.—Robin Line S. S. Co., owner of vessel.
ROSE MAHONEY.—Andrew F. Mahoney, owner of vessel.
RUSH.—Everett Packing Co., owner of vessel.
RUTH ALEXANDER.—Robert Dollar Co., owner of vessel.
SAG HARBOR.—Station operated and controlled by I. W. T. Co.

SAN ANTONIO.—American Finance & Commerce Co., owner of vessel.
SANGAMON.—System, Navy-W. S. A. Co., 1000.
SANTA ALICIA.—Western Mercantile Marine Corp., owner of vessel.
SANTA BARBARA.—J. R. Hanify Co., owner of vessel.
SANTA PAULA.—Range, 150.
SANTA ROSALIA.—W. l., 300, 450, *600*.
SAPINERO.—W. l., 300, 450, *600*.
SATSUMA.—New York & Oriental S. S. Co., owner of vessel.
SAXON.—System, Navy-Simon, 1000.
S. B. HUNT.—W. l., 300, 450, *600*.
SEACONNET.—Station operated and controlled by R. C. of A.
SECURITY.—S. O. Co. of New York, owner of vessel.
STANDARD 11.—S. O. Co. of New York, owner of vessel.
ST. ANTHONY.—W. l., 300, 450, *600*.
ST. CHARLES.—Range, 150.
ST. LOUIS.—Inland & Coastwise Waterways Service (Mississippi-Warrior Service), owner of vessel.
SUNLITE.—Range, 150.
SUNSHINE.—Name changed to Dean Emery; Pan-American Petroleum & Transport Co., owner of vessel.
SURUGA.—New York & Oriental S. S. Co., owner of vessel.
SWIFT ARROW.—Range, 300; system, R. C. of A., 1000; w. l., 300, 450, *600*; Swiftsure Oil Transport Co., owner of vessel.
SWIFTLIGHT.—Swiftsure Oil Transport Co., owner of vessel.
SWIFTSCOUT.—Swiftsure Oil Transport Co., owner of vessel.
SWIFTSTAR.—Swiftsure Oil Transport Co., owner of vessel.
SWIFT WIND.—Swiftsure Oil Transport Co., owner of vessel.
TASCO.—Name changed to Bonita; S. O. Co. of New Jersey, owner of vessel.
TECOMATE.—Atlantic Gulf Oil Corp., owner of vessel.
TIONESTA.—Great Lakes Transit Corp., owner of vessel.
TOILER.—Thomas J. Howard, owner of vessel.
TORMENTER.—Sinclair Navigation Co., owner of vessel.
TRANSPORTATION.—American-Hawaiian S. S. Co., owner of vessel.
TUCKAHOE.—Name changed to Seaconnet; C. H. Sprague & Son, owner of vessel.
TUSTEM.—U. S. Shipping Board, owner of vessel.
UNICOL.—Range, 300; system, Navy-Lowenstein, 1000; w. l., 300, 450, *600*.
VICKSBURG.—Inland & Coastwise Waterways Service (Mississippi-Warrior Service), owner of vessel.
VINTON COUNTY.—Name changed to Bogota.
VOLANT.—Strike out all particulars.
WABASH.—North Atlantic & Western S. S. Co., owner of vessel; station operated and controlled by R. C. of A.
WALLOWA.—Strike out all particulars.
W. B. KEENE.—Range, 150; system, R. C. of A., 1000.
WEST BRIDGE.—Station operated and controlled by I. W. T. Co.
WEST COYOTE.—System, Navy-Liberty, 1000; w. l., 300, 450, *600*; hours, X.
WESTERN OCEAN.—Station operated and controlled by I. W. T. Co.
WEST HENSHAW.—Station operated and controlled by I. W. T. Co.
WEST LEWARK.—Strike out all particulars.
WEST MUNHAM.—Station operated and controlled by R. C. of A.
WEST NOOSKA.—Range, 300; system, Navy-Liberty, 1000; w. l., 300, 450, *600*.
WESTOIL.—Waukau *Transit* Co., owner of vessel.
WEST POINT.—U. S. Shipping Board, owner of vessel.
WEST TOGUS.—Range, 300; system, Federal arc; w. l., 300, *600*, 1800.

WEST VIEW.—System, Navy-Marconi, 1000; w. l., 300, 450, *600*.
WHITEMARSH.—E. J. Stotesbury, owner of vessel.
W. H. MCGRAN.—Pioneer S. S. Co., owner of vessel.
WILLIAM B. LIVINGSTONE.—Columbia S. S. Co., owner of vessel.
WISLA.—Wisla S. S. Corp., owner of vessel; station operated and controlled by I. W. T. Co.
ZAREMBO.—U. S. Shipping Board, owner of vessel.
ZAVALLA.—Strike out all particulars.

COMMERCIAL LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDBK, *read* Maud F.; KDCY, *read* Surinam; KDFS, *read* Janelew; KDTL, *read* Nedeva II; KEDN, *read* Baracoa; KFT, *read* Bonita; KIQP, *read* Bolivar; KJC, *read* Commercial Pilot; KJOU, *read* Seaconnet; KOFG, *read* Dean Emery; KOKG, *read* Mooeitauka; KOKQ, *read* Paria; KORQ, *read* Bogota; KOVP, *read* Georgian; KUCZ, *read* Bridgetown; KUFK, *read* Haiti; KUQL, *read* Martinique; strike out all particulars following the call signals, KDNT, KDNU, KDON, KDOP, KDSN, KEMD, KERC, KEVC, KIPL, KOXQ, KQAI, KUZ, KWH, KZUI, WAH, WCI, WHX, WJK, WJT.

GOVERNMENT LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

CAMP MARFA, TEX.—W. l., 1350, 1700, 2100, 2700, *3100*, 3850.
CAPE HINCHINBROOK, ALASKA.—Loc. 0.146° 38′ 54″, N. 60° 14′ 00″.
CATTLE POINT, WASH.—Hours, midnight–2 a. m., 4–6 a. m., 4–6 p. m., 8–10 p. m. (75th meridian).
COLON, C. Z.—Loc. 0.79° 54′ 07″, N. 09° 22′ 08″.
MCGRATH, ALASKA.—Range, 200; system, U. S. Army; w. l., *600*, 1100; service, PR (FX); hours, X.
NEW DUNGENESS, WASH.—Hours, midnight–2 a. m., 4–6 a. m., 4–6 p. m., 8–10 p. m. (75th meridian).
SMITH ISLAND, WASH.—Hours, midnight–2 a. m., 4–6 a. m., 4–6 p. m., 8–10 p. m. (75th meridian).
SOAPSTONE POINT, ALASKA.—Loc. 0.136° 29′ 51″, N. 58° 06′ 13″.
ST. MICHAEL, ALASKA.—Range, 350; system, U. S. Army; w. l., *600*, 1000; service PR (FX); hours, X.

GOVERNMENT SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

ARCTURUS.—Name changed to Gold Star.

GOVERNMENT LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NASJ, *read* Gold Star.

SPECIAL LAND STATIONS, BY NAMES OF STATIONS.

BALTIMORE, MD. (3XAA).—W. l., 175 to 375.
BALTIMORE, MD. (3XT).—W. l., 175 to 375.
BETHESDA, MD. (3ZF).—*Read* Friendship Heights, Md.
CAMBRIDGE, MASS. (1XJ).—W. l., variable.
CORVALLIS, OREG. (7YJ).—Strike out all particulars.
GOLDEN, OHIO (9XAI).—*Read* Golden, Colo.
HOUSTON, TEX. (5YI).—Call signal changed to 5YG.
HOUSTON, TEX. (5ZT).—W. l., *200*, 375.
LIHUE, HAWAII (6ZAC).—*Read* Wailuku, Hawaii.
LITTLE ROCK, ARK. (5YH).—Capt. Norman L. Baldwin, owner of station.
MONTGOMERY, ALA. (5XR).—W. l., variable.

PARKESBURG, PA. (3ZO).—W. L., 200, 375.
PAWTUCKET, R. I. (1XAD).—W. L., variable.
PITTSBURGH, PA. (8XV).—W. L., variable.
SALT LAKE CITY, UTAH (6ZM).—The Deseret News, owner of station.
SAN FRANCISCO, CALIF. (6ZAB).—Strike out all particulars.
SAN FRANCISCO, CALIF. (6ZAG).—Strike out all particulars.
SCHENECTADY, N. Y. (2XY).—Call signal changed to 2XAE.
ST. DAVID'S, PA. (3ZS).—W. L., 200, 325, 375.

MISCELLANEOUS.

PROPERTIES OF INDUCTANCE COILS AT RADIO FREQUENCIES.

A coil of wire wound in any one of many different familiar forms constitutes an "inductance coil." The behavior of such coils in circuits carrying direct current or alternating currents of low frequencies, such as 60 cycles, has been studied for many years and is well known. When the attempt is made to predict the behavior of an inductance coil at radio frequencies by extending the relations which are sufficient to predict its behavior at low frequencies, it is found that other effects are present at the radio frequencies which do not require consideration at the low frequencies. At low frequencies the same number of amperes flows in every part of the wire constituting the inductance coil, and the distribution of the current over a given cross section is practically uniform. At high frequencies the current density is not uniform over a given cross section of a wire, nor is it the same for different cross sections of the wire. The current flow is modified by induction effects of magnetic as well as electrostatic nature. For direct current the resistance of inductance coils can be determined by Ohm's law, but at radio frequencies Ohm's law by no means gives complete information regarding the resistance of a coil. The study of nonuniformity of current density in a particular cross section is the subject of "skin effect," and considerable work has been done on this subject. The differences in the current flowing across different cross sections of the wire forming a coil are caused by the capacities distributed along the winding of the coil.

An inductance coil behaves in an electric circuit primarily as an inductance. The potentials of the different parts of the coil are, however, different from each other and from the potential of the ground. For this reason the coil behaves also to a certain extent as an electric condenser, or rather a system of condensers. The impedance of these capacity paths is low at radio frequencies, and the capacities constitute shunt paths for the radio-frequency current and cause charges to collect at various points of the coil, thus creating back electromotive forces. There are several effects of the nonuniform distribution of current along the wire, of which the most important is the increase in the resistance of the coil with the frequency. At radio frequencies the resistance of an inductance coil depends upon the point of the coil at which an emf is inserted and the current measured.

On account of the importance of inductance coils in radio communication, careful studies, both theoretical and experimental, have been made at the Bureau of Standards on capacity effects and other effects in inductance coils at radio frequencies. Some of the results of these investigations are contained in a new publication, Bureau of Standards Scientific Paper No. 430, The High-Frequency Resistance of Inductance Coils, by Gregory Breit. In this paper a formula for the resistance of an inductance coil is derived which takes into consideration both the skin effect and the capacity effect for the case of a short single-layer solenoid, and the results of experiments are given which check this formula. Other more general formulas for current distribution and resistance are also derived. A copy of this paper may be purchased for 5 cents from the Superintendent of Documents, Government Printing Office, Washington, D. C.

If an inductance coil is connected in series with a condenser, it is found that the true capacity of the whole circuit as computed from the observed resonance frequency and the known inductance is not the same as the capacity of the condenser alone. The difference is in large part due to the distributed capacity of the inductance coil. A general discussion of the effects of the distributed capacity of inductance coils may be found in a paper by G. Breit published in the issue of the Physical Review for June, 1921.

If radio-frequency current is flowing in a circuit consisting of two variable condensers in series connected across the terminals of an inductance coil, the circuit may be tuned to resonance by adjusting either condenser. There is a simple well-known formula for the capacity of two condensers in series from which the condition for resonance in such a circuit may be computed for low frequencies. At radio frequencies, however, the distributed capacity of the inductance coil introduces another factor. If the system is tuned to resonance by successively assigning arbitrary values for the setting of one condenser and then tuning with the other, the successive resonance values of the capacity of the two condensers in series, computed from the familiar formula, is not constant, as would be expected. An interesting relation has been found to hold for this circuit for the special case in which the common terminal of the two condensers is grounded. In this case it is found that the capacity of the two condensers in series, as computed from the familiar formula, is inversely proportional to the sum of their capacities. This relation has been verified both mathematically and experimentally, and the results of both investigations are given in a recent publication, Bureau of Standards Scientific Paper No. 427, Some Effects of the Distributed Capacity Between Inductance Coils and the Ground, by Gregory Breit. Copies may be purchased for 5 cents from the Superintendent of Documents.—*Submitted by Bureau of Standards.*

THE PRINCIPLES UNDERLYING RADIO COMMUNICATION.

The Government Printing Office at Washington has just issued an elementary book on radio communication. This book is The Principles Underlying Radio Communication, Signal Corps Radio Communication Pamphlet No. 40, second edition. The first edition was prepared during 1918 at the Bureau of Standards at the request of the Signal Corps for use as a textbook in training enlisted men of the Signal Corps for radio service. The revised edition has also been prepared at the Bureau of Standards, and has been considerably increased in size. Some obsolete material appearing in the first edition has been replaced, and considerable new material has been added. There is new material on batteries, ordinary wire telegraphy and telephony, line radio communication, transformers, antennas including coil antennas and direction finders, transmitting apparatus, particularly arc converters, electron tubes and electron tube apparatus, a. c. plate supply, and radio telephony. Numerous circuit diagrams are given. The construction of antennae and ground connections are described, and other useful practical information is given. The book also contains a table of dielectric constants, copper-wire tables, wave-length tables, and the International Code, safety precautions for radio stations, information regarding radio laws and regulations, and regarding radio publications, including Government publications. A complete index has been added. The revised edition contains over 600 pages and more than 300 illustrations, many of them photographs. The book is durably bound in fabrikoid.

The first chapter deals with elementary electrical principles, the second chapter with dynamo-electric machinery, and four other chapters deal with radio principles and practice and discuss the construction and operation of the important types of radio transmitting and receiving apparatus. The book assumes that the reader has had at least the major part of a high-school course, but does not assume a knowledge

of mathematics beyond algebra. By a study of this book a person having some general familiarity with electricity can acquire a good foundation in the principles of radio communication.

The first edition enjoyed a wide sale to many different classes of readers, and was used as a textbook by various schools and colleges as well as by the Signal Corps.

A copy of the revised edition can be purchased for $1 from the Superintendent of Documents, Government Printing Office, Washington, D. C. This price includes postage in the United States and its possessions, and in Canada, Cuba, Mexico, and Panama. For other countries an extra allowance of 20 cents should be made for postage.—*Submitted by Bureau of Standards.*

FRENCH GOVERNMENT COMMUNICATION PERIODICAL.

American radio men will find much of interest in a French Government periodical called Annales des Postes, Télégraphes, et Téléphones. This periodical is issued bimonthly by the French Ministry of Posts and Telegraphs, and each issue usually contains from 100 to 200 pages. It has already been established for 10 years. Telegraphy, telephony, radio communication, and the machines used in post offices are included in its field. In wire telegraphy, automatic high-speed systems, as well as older systems, are covered. Communication by submarine cables also receives attention. In telephony, attention is given to the ordinary systems, and to automatic systems, repeating devices, traffic and operating problems, and the use of radio-frequency currents. In radio communication, attention is given to the principles, construction, and operation of a wide variety of devices and methods for transmission and reception. Results of researches conducted by the Ministry of Posts and Telegraphs are published in this periodical. Notices and abstracts are published of articles pertinent to the field of the Annales which appear in other French periodicals, and in foreign periodicals. The editorial staff of the Annales includes a number of prominent engineers, including Messrs. Dennery, Blondel, Ferrié, Milon, Abraham, and Gutton. The annual subscription price is 27 francs, and orders may be addressed to the Annales at 3 Rue Thénard, Paris, France.

RADIO DIRECTION FINDER AND ITS APPLICATION TO NAVIGATION.

The Bureau of Standards has issued a paper entitled Bureau of Standards Scientific Paper No. 428, The Radio Direction Finder and Its Application to Navigation, by F. A. Kolster and F. W. Dunmore. A copy may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., for the sum of 15 cents. Remittances should be made by money order; cash may be sent at sender's risk. Postage stamps and personal checks are not accepted.

A small pamphlet on the subject of Radio Fog Signals has also been published by the Bureau of Lighthouses, and will be supplied on application to the Bureau of Lighthouses, Washington, D. C.

RADIO TELEPHONE CONFERENCE IN WASHINGTON.

At the suggestion of President Harding, Secretary Hoover held a conference on the 27th of last month of representatives of various radio interests to investigate the development and regulation of the radio telephone.

Experts from the various interests, including the amateurs, attended the meeting and were given opportunity to express their opinions.

At the conclusion of the conference Secretary Hoover appointed the following committees to look into the different phases of radio telephone communication:

Legal: Representative Wallace H. White, chairman; A. J. Tyrer, Deputy Commissioner of Navigation; W. D. Terrell, chief radio inspector, Bureau of Navigation; Senator Frank B. Kellogg.

Technical: Dr. S. W. Stratton, Director of Bureau of Standards, chairman; Maj. Gen. George O. Squier, U. S. A.; Capt. S. W. Bryant, U. S. N.; Prof. A. L. Hazeltine, Stevens Institute, Hoboken, N. J.; Dr. Alfred N. Goldsmith, secretary, Society Radio Engineers, New York City; Edwin H. Armstrong, Columbia University, New York City; Prof. C. M. Jansky, jr., University of Minnesota; W. A. Wheeler, Department of Agriculture; J. C. Edgerton, Post Office Department.

Amateurs: Hiram Percy Maxim, chairman, Hartford, Conn.; Edwin H. Armstrong; Prof. C. M. Jansky, jr.; Prof. L. A. Hazeltine.

CHANGE IN RATE FOR STATIONS OF RADIO CORPORATION OF AMERICA.

Beginning April 1 next, the rate for all ships transmitting traffic via the New York (WNY) and New London, Conn. (WLC), radio stations of the Radio Corporation of America will be 10 cents per word. The special rate of 8 cents per word will no longer be applicable to vessels plying between ports within 200 miles of New York, N. Y.

CHARGES FOR MESSAGES OF UNITED STATES NAVAL VESSELS.

When United States naval vessels transmit Government Navy messages ashore, they sometimes employ the call sign "NBO," which is to be taken as signifying "U. S. Navy Vessel." In this case the preamble may show the office of origin as the "U. S. Navy" and the messages may be unsigned. These messages will always be addressed to "USNAVCOM ——." Charges for such messages should be billed to the Naval Communication Service and sent to the Director of Naval Communications, Washington, D. C., for payment.

LOST COMMERCIAL RADIO OPERATORS' LICENSES.

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

Name.	Grade.	Number.	Date issued.	Port issued.
Babb, Wm. C.	Second	12568	Nov. 11, 1920	Baltimore.
Barth, Edward	First	221	Nov. 9, 1921	New York.
Benson, John	First	23346	Dec. 19, 1921	Chicago.
Bernstein, Aaron	First	23584	Apr. 4, 1921	New York.
Bromley, Arthur C.	First	20186	Dec. 1, 1919	Seattle.
Chapman, Gordon G.	First	21024	Apr. 22, 1921	New York.
Darney, Frank L.	First	21032	Apr. 28, 1921	New York.
Glauber, John	First	19139	Sept. 22, 1919	New York.
Hayford, Rucher B.	Second	13681	June 15, 1920	New Orleans.
Kolbe, George H.	First	23621	Sept. 11, 1922	New York.
Meader, Raymond B.	First	16005	Sept. 10, 1920	Boston.
Purrington, Leslie M.	First	19302	Nov. 21, 1919	Boston.
Roswell, Lucian M.	First	1317	July 14, 1921	San Francisco.
Stiller, F. L.	First	24167	Apr. 1, 1921	San Francisco.
Van Thun, Henry B.	First	725	Aug. 19, 1921	New York.

List of stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (360 meters), (March 10, 1922).

Owner of station.	Location of station.	Wave lengths.	Call signal.
Allen, Preston D.	Oakland, Calif.	360	KZM.
American Radio & Research Corp.	Medford Hillside, Mass.	360	WGI.
Atlantic-Pacific Radio Supplies Co.	Oakland, Calif.	360	KZY.
Bamberger, L., & Co.	Newark, N. J.	360	WCR.
Bible Institute of Los Angeles, Inc.	Los Angeles, Calif.	360	KJS.
Church of the Covenant	Washington, D. C.	360	WDM.
City of Chicago	Chicago, Ill.	360	WBU.

List of stations broadcasting market or weather reports (485 meters) and music, concerts, lectures, etc. (360 meters), (March 10, 1923)—Continued.

Owner of station.	Location of station.	Wave lengths.	Call signal.
Cox, Warren R.	Cleveland, Ohio	360	WHK.
Crosley Mfg. Co.	Cincinnati, Ohio	360	WLW.
DeForest Radio Telep. & Teleg. Co.	New York, N. Y.	360	WJX.
Detroit News, The	Detroit, Mich.	360, 485	WWJ.
Doubleday-Hill Electric Co.	Pittsburgh, Pa.	360	KQV.
Dorrn Brothers Electric Co.	Hamilton, Ohio	360	WRK.
Duck Co., Wm. F.	Toledo, Ohio	360	WHC.
Dunn & Co., J. J.	Pasadena, Calif.	360	KLB.
Electric Lighting & Supply Co.	Hollywood, Calif.	360	KGC.
Examiner Printing Co., The	San Francisco, Calif.	360	KUO.
General Electric Co.	Schenectady, N. Y.	360	WGY.
Gilbert Co., A. C.	New Haven, Conn.	360	WCJ.
Gould, C. O.	Stockton, Calif.	360	KJQ.
Hamilton Mfg. Co.	Indianapolis, Ind.	360	WLK.
Hatfield Electric Co.	Indianapolis, Ind.	360	WOH.
Herrold, Chas. D.	San Jose, Calif.	360	KQW.
Hohrecht, J. C.	Sacramento, Calif.	360	KVQ.
Howlett, Thos. F. J.	Philadelphia, Pa.	360	WGL.
Karlowa Radio Co.	Rock Island, Ill.	360, 485	WOC.
Kennedy, Colin B. Co.	Los Altos, Calif.	360	KLP.
Klaus, Arno A.	Los Angeles, Calif.	360	KQL.
Kraft, Vincent J.	Seattle, Wash.	360	KJR.
Lorden, Edwin L.	San Francisco, Calif.	360	KGB.
Marshall-Gerken Co.	Toledo, Ohio	360, 485	WSZ.
Metropolitan Utilities District	Omaha, Nebr.	360, 485	WOU.
Meyberg Co., Leo J.	San Francisco, Calif.	360	KDN.
Meyberg Co., Leo J.	Los Angeles, Calif.	360	KYJ.
Missouri State Marketing Bureau	Jefferson City, Mo.	485	WOS.
Montgomery Light & Water Power Co.	Montgomery, Ala.	360, 485	WOH.
Newspaper Printing Co.	Pittsburgh, Pa.	360	WPB.
Northern Radio & Electric Co.	Seattle, Wash.	360	KFC.
Palladium Printing Co.	Richmond, Ind.	360, 485	WOZ.
Pine Bluff Co., The	Pine Bluff, Ark.	360	WOK.
Pomona Fixture & Wiring Co.	Pomona, Calif.	360	KGF.
Portable Wireless Telephone Co.	Stockton, Calif.	360	KWG.
Precision Equipment Co.	Cincinnati, Ohio	360, 485	WMH.
Precision Shop, The	Gridley, Calif.	360	KFU.
Radio Construction & Electric Co.	Washington, D. C.	360	WDW.
Radio Corporation of America	Roselle Park, N. J.	360	WDY.
Radio Shop, The	Sunnyvale, Calif.	360	KJJ.
Radio Telephone Shop, The	San Francisco, Calif.	360	KYY.
Reynolds Radio Co.	Denver, Colo.	360, 485	KIZ.
Rike Kumler Co., The	Dayton, Ohio	360, 485	WFO.
Rochester Times Union	Rochester, N. Y.	360, 485	WHQ.
Seeley, Stuart W.	East Lansing, Mich.	485	WHW.
Service Radio Equipment Co.	Toledo, Ohio	360	WJK.
Ship Owners Radio Service	New York, N. Y.	360	WDT.
Union College	Schenectady, N. Y.	360	WRL.
University of Minnesota	Minneapolis, Minn.	360, 485	WLB.
University of Wisconsin	Madison, Wis.	360, 485	WHA.
Warner Bros.	Oakland, Calif.	360	KLS.
Wanner, Louis	Seattle, Wash.	360	KHQ.
Westinghouse Electric & Mfg. Co.	Springfield, Mass.	360	WBZ.
Westinghouse Electric & Mfg. Co.	Chicago, Ill.	360	KYW.
Westinghouse Electric & Mfg. Co.	Newark, N. J.	360	WJZ.
Westinghouse Electric & Mfg. Co.	East Pittsburgh, Pa.	360	KDKA.
Western Radio Electric Co.	Los Angeles, Calif.	360	KOG.
Western Radio Co.	Kansas City, Mo.	360, 485	WOQ.
White & Boyer	Washington, D. C.	360	WJH.
Wireless Telep. Co. of Hudson County	Jersey City, N. J.	360	WNO.

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